# Regional State of Tigray

# Bureau of Planning and Finance

# Socio-Economic Baseline Survey Report of Tigray Regional State


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## List of Acronyms and Abbreviations

| | |
|---|---|
| **ANC** | Antenatal care |
| **DECSI** | Dedebit Credit and Saving Institution |
| **EDHS** | Ethiopian Demographic and Health Survey |
| **ETB** | Ethiopian Birr |
| **FGD** | Focus Group Discussion |
| **FP** | Family planning |
| **KII** | Key Informant Interview |
| **HDA** | Health Development Army |
| **HC** | Health Center |
| **HEW** | Health Extension Worker |
| **HP** | Health Post |
| HTP | Harmful traditional practice |
| **PNC** | Post-natal care |
| **TBA** | Traditional birth attendant |
| **$U_5$** | Under five |
| **Wgt** | Weighted |
| ATA | Agricultural transformation agency |
| CSA | Central Statistical Agency |
| DAP | Di-ammonium Phosphate |
| Gov't | Government |
| Ha | Hectare |
| Household or HOUSEHOLD | Household |
| Hr | Hour |
| Kg | Kilogram |
| N | Number of households |
| NGO's | Non-governmental organization |
| No. | Number |
| Qt | Quintal |
| SD | Standard deviation |
| SE | Standard error |

## Definitions and concepts

**Annual crops** are crops which are grown in less than a year's time, sometimes only a few months with an objective to sow or replant again for additional production following the current harvest (CSA, 2018).

Perennial (Permanent) crops are plants which are grown and occupy land for a long period of time, not requiring replanting for several years after each harvest. Fruit trees (i.e. oranges, mandarin, bananas, etc) and trees for beverages (i.e. coffee, tea, hops (Gesho), etc) are considered as permanent crops (CSA, 2018).

**Keremt** is the main rainy season in Ethiopia which spanned from June to September inclusively.

**Belg** is the short rainy season in Ethiopia which spanned from February to Mayinclusively.

**Tsimad** refers to farmland size which equals to quarter of a hectare. It is basically used by farmers to indicate how big a farm land is and it is based on the land size ploughed by a pair of oxen in one day (8 hrs on average)

**Commercial farms** are farms which are used for crop production mainly to sell for profit. The area cultivated and the amount of capital invested in commercial farming is larger than in the subsistence farming.

**Woreda** is a district which is the third-level administrative divisions of Ethiopia. Woreda is further subdivided into a number of kebele or tabia which are the smallest unit of local government in Ethiopia.

**Tabia/kebele** is the smallest administrative unit of Ethiopia.

**Drought** is defined as an extended period of deficient rainfall relative to the statistical multi-year average for a region. This deficiency results in a water shortage for crop and animal feed production, drinking water for human and livestock.

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# Executive Summary

## Education and Demography

At a regional level, the figures for household distribution by family size show that most have between 2 and 6 members. With regard to age categories, the majority were young under the age of 35. Similarly an overwhelming majority of the household were married; although the proportion of the never married was found to be high in urban areas. Also, a significant proportion of female headed household were widowed and divorced. The most dominant religion in both rural and urban locations was found out to be Orthodox Christianity with a vast majority belonging to Tigraway ethnic group. The dominant source of income in rural area is agriculture, with farming and animal husbandry as the main means of livelihood. In terms of education, only a negligible proportion has tertiary level education. Over-occupation with domestic activities has often led to non-attendance or school dropouts particularly in rural areas. A small percentage of household heads indicated they participated in adult and religious education, while modern enrolments take the lions hare of literacy achievements.

At a regional level, majority of households who participated in the socio-economic baseline survey claimed they have to travel for less than an hour to reach the nearest primary school while secondary schools remain relatively less accessible particularly in the rural areas; but generally the findings indicate that there have been an overall improvement in educational coverage in Tigray. Similarly distance to other facilities has also been minimized due to expansion of facilities. Tigrayan youth have been prone to migration and the main reasons indicated were inability to find jobs and search for better life elsewhere particularly outside the region and overseas.

## Agriculture

Agriculture in Ethiopia is the backbone of the national economy, and the source of foreign currency earning and raw materials for the local agro-industries. It contributes to 42.5% of the national gross domestic product (CSA, 2008), and 90% of export earnings (Assefa, 2005). The share of crop production in agriculture is estimated at 68.4% (CSA, 2008).

Crop production is among the activities in which people are engaged to lead their life. In the Tigray Region, 53.4 % of the householders were generally engaged in crop production. Among

the total householders engaged in the farming activity 27% were females. In the urban, 13% of the households were involved in the farming activities either as a side or main business. In the rural, 75% of the total householders were engaged in farming out of which 26% were females. The regional average land holding used for crop production was 0.6 ha. The majority of the householders (78%) own smaller land size (0.01-1.0 ha). About 16% of the householders own 1.0-2.0 ha.

Cereals, pulses, oil crops, and various vegetable and fruit crops are cultivated in the Tigray region. Among the cereal crops, tef, barley wheat, sorghum are dominant. Sesame is a major oil crop cultivated in Western, North Western and Central zones of Tigray. Among the legume crops, lentil, and faba bean were grown in different parts of the region. According to the householder respondents, sorghum and maize were productive crops which yielded 18 and 15 qt/ha, respectively. The productivity of wheat and barley was 14 and 12 qt/ha, respectively. Tef and finger millet yielded 11 and 8 qt/ha, respectively. Within the oil crops, sesame and linseed are two items captured in the survey. The productivity of sesame was 8 qt/ha whereas linseed yielded 3 qt/ha. Among the pulse crops, the productivity of fababean and lentils was 7.4 qt/ ha and 7 qt/ha, respectively. When compared with the crop productivity reported by CSA (2018) for the cropping season of 2017/18, crop productivity reported in this survey was lesser by 27-70%. This discrepancy in crop productivity was resulted because of methodological differences used between the two assessments where crop productivity in this survey was based on interview with the householders but the assessment made by CSA was based on measurement of crop yields from a sampled of crop fields and plots.

About 28% of the sampled householders in the Tigray region had perennial plants. Oranges, cactus, papaya, avocado, lemon and banana were among the perennial crops captured during the study. Excepting cactus and banana, above 85% of the household owned fruit trees in the ranges of 1 to 50.

Almost all subsistence farmers in the Tigray region plough their lands with ox. Out of the total household's, 34% had no ox that could be used for ploughing their land. Among those household who hadn't ox, 17% each were male and females. Furthermore, 28.6% of total household's had one ox among which 24.4% were male and 4.2% were female household's. The percentages of

household with two oxen in the region comprised 33.3% out of which 30.8% were males and 2.5% were female household's. Generally, these results indicate the female household's were with less possession of ox which might force them to rent or share-out their farmlands.

Use of high yielding and clean seeds is one of the important inputs to enhance crop productivity. Among the total household respondents, 21% used improved seeds while 79% didn't use improved seeds. When regarded by crop type, improved seeds of tef (67%) and wheat (60%) were the ones which most of the farmers use. Maize was also the third in the rank (15% of the respondents). On average, 60 kg of improved wheat seeds was used by 558 householders, and 18.1 kg of improved tef seeds was used by 438 householders. About 77% of the householders of who responded of not using improved seeds said higher seed price constrained them for not using improved seeds while 8% of respondents attributed to non-availability of improved seeds.

Low soil fertility is among the major constraints in Tigray region that reduce crop productivity. Poor soil fertility is attributed to the overall land degradation. Most soils in the region have been highly degraded because of long years' of continuous cultivation, poor soil fertility management, deforestation, soil erosion, improper land use systems etc. As a means of maintaining or improving soil fertility 24% of the householders responded applying commercial fertilizers while 20 % of the householders said they apply both commercial and manure for improving soil fertility. Availability of commercial fertilizers had not been a constraint (95% of the householder respondents). It is, however, noted that 79-89% of the respondents used less than 50 kg of Urea, DAP and other type of fertilizers. This seems quite a low amount of fertilizer consumption to improve soil fertility and thereby enhance crop productivity. About 37% of the respondents whom didn't use chemical fertilizer said that increased price was the limitation while 34% of the respondents indicated shortages of rainfall and sufficient soil fertility were the reasons of not using chemical fertilizers. Surprisingly 12.4% of the householders who didn't use fertilizer believed that applying commercial fertilizer was not useful. When asked about fertilizer consumption rates, 41% of the respondents used 51-100 kg of Urea and DAP each per ha, while another 40% of the respondents consumed below 50 kg of Urea and DAP each per ha. In addition to applying fertilizer, intercropping, crop rotation and fallowing contributes in soil fertility improvement. About 88% of the householders practiced crop rotation, but intercropping was practiced by 77% of the householders. Fallowing was practiced by 35% of the householders.

About 90% of the householders who didn't fallow said that shortage of farmland was the reason that limited them for not fallowing.

The potential crop yield couldn't be attained because of various limitations. Late onset and early cessation of rainfall, less amount of rainfall, water logging, crop damage by rodents, insect pests and diseases, hail, flood, and frost are among the limitations. About 51% of the respondents complained of water stress due to less amount of rainfall, while 18% indicated late onset and early cessation of rainfall as constraints in crop production. When analyzed within the pests and diseases category, 66% of the respondents said insects were the major causes of crop loss. Another 13 % of the respondents mentioned weeds to be the main constraints and while 12% of the respondents attribute the losses to diseases. Use of chemicals for the control of pests and diseases in the crop field was generally low in the region. Most of the respondents (23-32%) mentioned that higher price had been the main limitation for not using chemicals. Another 19-22% of the respondents also said that lack of knowledge in the importance and availability of chemicals limited them not to use chemicals.

Annual crops are produced based on rainfall as source of water. The main rainy season spanned between June and September. About 97% of the householders produced crops only once in the year while 2.9% of the respondents produced twice per year. With regard to sufficiency of food within a year, 66% of the householders responded to having difficulty in having enough food for a year. Among the householders who had shortages of food for a year, 56% of them faced shortages for over six months, 24 % had shortages for 4-5 months, and 16% had shortages for 2-3 months.

After crop harvest, grain is stored in different storage structures. Plastic bag (=Tirinshwa) is the main material (50% of respondents) used for storing grain. This is followed by Godo (27% of respondents) and sisal bags (12.2% of the respondents). About 34% of the householders stored their harvest for 6-8 months, while 28% of the respondents each stored their grain for over 8 months, and for 3-5 months. During storage, grain is affected by different biological agents (fungus, weevils, rodents etc). Overall, losses up to 10% were commonly responded for wheat, barley, maize, sorghum and pulses. About 39% of the householders indicated weevils as major causes of post-harvest losses while another 37% of the respondents said it was rodents which

caused major losses. Termites and lack of care were also other causes of losses even though the percentages of respondents were low (4-5%). As post-harvest grain management practices, about 23 % of the respondents used traditional and chemicals to control the causes of losses. About 7 % of the respondents use ash as traditional control means. With regard to control measures, 12% of the respondents used insecticides in form of dusts while 4% use fumigants.

The summer season is the main cropping period where most of the annual crop production is harvested. However, most devastating Ethiopian droughts are associated with failure of summer rains (Segele and Lamb, 2005). Droughts due to insufficient and/or poor distribution of rainfall are a common incidence. About 63% of the householders indicated the occurrence of drought in the last five years. According to the majority of the respondents, drought occurred once every five years (42% of respondents) or twice every five years (34% of the respondents). About 24 % of the respondents also mentioned occurrence of drought once every almost two years. When the different householders were asked about the cause of drought, 42% of them indicated the curse of God, while 13% of the respondents attributed to environmental degradation. The view of the respondents towards overpopulation and environmental degradation was very low. When suggesting in overcoming drought, 38% of the respondents said praying to God as the main solution, while 18% said environmental protection was the main solution. When asked whether drought could occur in the future, 73% of the respondents said God knows. In response to the impacts of drought, 58% of the respondents received help from governmental and non-governmental organizations and relatives. Eighty six percent of the householders received help from government while relatives shared 2%.

Food security is important dimension of development in the agriculture sector. Among the total householders, 2.5% of the householders in the region had no enough food in the whole year, while 2.7 % had enough food only for 1-2 months. Generally, 54% of the householders had enough food for 10-12 months, but 43% of the householders had shortages of food for the period ranging between 1 and 10 months. In the urban, 75% of the householders responded to having enough food for the period of over 10 months. However, 5.3% of the sampled householders responded to shortages of food throughout the year. In the rural area, 44% of the householders responded to sufficiency of food for a year. It is only one percent of the householders who responded to shortages of food throughout the year.

Livestock is part and parcel of Tigray agricultural system. Livestock rearing is practiced by 74.54 percent of rural households and 11.47 percent of urban households. Cattle are the most common types of livestock owned by households. Most of the cattle are indigenous breeds (98 percent) and only 2 percent are exotic. Livestock holding (3.36 TLU) is higher in rural (3.32 TLU) than urban (2.88 TLU). Crop residues and hay are the major feed resources for livestock. There is limited utilization of improved fodder and industrial by-products for various reasons. Majority of rural holders (78 percent) practice free animal breeding and only 4 percent use AI. Nearly 21 and 44 percent of holders practice dairy and poultry farming, respectively. Dairying is largely practiced using local cows (90 percent) and only few exotic (7 percent) and hybrid (3 percent). Daily milk production is 1.13 liter for local cows, 6.82 liter Begait cows, 8.24 liter hybrid cows and 11.29 liter exotic cows. Nearly 28 percent of poultry producers own exotic/hybrid chickens. Exotic/hybrid hens (249 eggs/hen/year) produce more eggs than local hens (56 eggs/hen/year). About 6.5 percent of holders practice beekeeping; of which 23 percent possess modern beehive. Honey yield is more for modern hive (12.92 kg/hive/year) than traditional hive (6.84 kg/hive/year). Holders fetch about 4688 birr revenue from livestock.

**Employment opportunities**

The main source of income of sampled households (urban areas) is professional 28%, followed by unskilled production worker 24%.

**Household Income sources** Household Income and Expenditure: The overall annual per household income is Birr 25365, 21800, and 29823 for region, urban, and rural areas respectively. In terms of inequality the per adult income quintiles of the lowest quintile (in our case 3), earn Birr 701 compared to the earning of the richest group ($5^{th}$ quintiles) of birr 16,072).

**Household consumption expenditure**

Poverty, Incidence, Intensity and Severity: On the basis of the absolute poverty line (per adult per year birr 7292) estimated using the current household survey data the regional head count ratio was estimated at 29.60%, 21.5%, and 37% for region, urban and rural areas respectively.

Similarly, using an per adult per year income level of birr 3792 food poverty line the poverty level was found to be 15%, 10.5% and 19.3% for region, urban and rural areas respectively.

## Asset ownership and Credit

According the CSA of Ethiopia and World Bank (2017), asset ownership is considered an important measure of welfare. The acquisition of assets can signal improving living standards, while the depletion of assets can indicate shrinking household wealth and thus a decline in welfare. Households in the surveyed zones have possessed different assets. For instance, in the urban, infant towns and rural areas, 38.08, 38.59 and 53.83 percent possessed their own houses respectively. At the regional level, 46.41 percent of the respondents possess their own houses. Moreover, in the urban areas 83.81 percent of the respondents own mobile phone. This is lower than the urban mobile ownership at the country level studied by CSA. The mobile ownership for the urban areas at national level was 89.3 percent (CSA, 2017). But when the regional level average (61.59 percent) is taken, the percentage of mobile owners is higher than the aggregate country level (54.4 percent) studied by the agency.

Gold is one of the precious assets that households keep for the uncertain future. At the regional level, 19.73 percent of the household own gold. In the urban centers, the ownership of gold is 37 percent. When this is compared to the results of CSA, gold ownership for the nation as a whole and urban center is 16.4 and 32.8 percent respectively.

Financial assets are measured using proxy indicators, namely livestock assets, access to banking and savings and credit associations. Commercial banks and Micro Finance Institutions are expanding their branches for the sake of financial inclusions. At the regional level 19.88% of the respondents have taken credit from different sources in the year 2009 E.C. However, 80.12 percent of the respondents did not take credit in the same year. According to the CSA baseline assessment, 23.4 of the respondents took loan from different sources. This proportion is higher than the proportion of borrowers in Tigray.

### Water supply and irrigation

The aim of this section was to assess the existing water distribution conditions (e.g., water sources, equity, reliability and variability of water supply) for both domestic and irrigation purposes in Tigray region. Parameters assessed in the survey of water supply section includes sources of water for various domestic uses (e.g. drinking, bathing), the per capita daily water

consumption of the household, time spent to fetch water from main water source, adequacy of drinking water supply, water supply services interruption, physical quality of water and corresponding treatment mechanisms, and costs related to the water supply. Similarly, under irrigation part, some of the parameters surveyed consists availability of irrigation scheme, sources and adequacy of water for irrigation, type of irrigation, Size of irrigable land (ha) , coverage, water users association, participation and access of women in irrigation scheme , and major problems of the irrigation schemes at household level and the likes .

Results indicated that (1) 97.1% of Urban, 88.7 of infant towns, 77.1% of rural and 85.3 % of regional households have access to an improved /protected water sources while remaining portion of the society get from unimproved/unprotected sources (2) Considering the quantity (volume) and distance criteria set in regional water bureau and GTP-2, the study showed that the access to water coverage of the region, major towns, infant towns and rural areas are 13.94%, 5.53% and 10.1% and 21.5 respectively, which is very far below from the coverage calculated by the water resources bureau. This means that most people are getting very less amount of water per day per capita than the standard set by the water bureau. For example, 89%, 88.85%, 94%, and 91.7% of the respondents in the urban, infant towns, rural and regional respectively gets less than 25 liter/capita/day water, (3) 87.8% of urban, 72.7% of infant towns and 34.7 % of rural areas travel less than 15 minutes1 to access the nearby water sources. Moreover, results revealed that adult women are more responsible in fetching water in the family (4) of those households that had a household tap, 76% in urban, 59 in the infant towns and 40% in rural areas are experienced interruptions in water service (5) 59.4%, 51.2%, 41.1 % and 48.7 % of respondents of urban, infant towns, rural and regional respectively indicated that the water supply is not adequate throughout the year (6) Of the survey samples considered, the irrigation coverage in urban, infant towns, rural areas and regional level are 1.2%, 3.24%, 5.84% and 3.9% respectively (7) 29% of urban, 54.7% of infant towns, 55.3 of rural areas and 52.3% region have less than 0.25ha average land holdings under irrigation, (8) the house holds use sources of water for irrigation 58.3 % from surface water (river, spring and pond) and 37.5% from groundwater (private and communal hand dug wells and deep wells) to irrigate their land at regional level, (9)

[1] 15 minutes' walk is equivalent to 1.2km distance as converted using the convention of ''1hour walk is equivalent to 5km distance ''

About 25%, 26.9% and 30.4% of the sample respondents at the major towns, infant towns and rural areas respectively confirmed that there is no involvement of women and no delivery of a fair share of water to users throughout the irrigation system, (10) the major problems in the irrigation schemes at regional level includes shortage of water (26.8%), social conflict (20.2%), lack of market (19.4%), operation and maintenance (17.2%) and others.

## Health

To achieve a set targets on health and prioritized with coverage targets for 2020. The regional government of Tigray is at most need to look in to studies which would emphasize the need for intensified effort in areas requiring equitable development to address visible gaps in health and development. As part of the ongoing efforts to improve the socioeconomic status of the region, socioeconomic survey was conducted in collaboration with Mekelle University, Adigrat University and Aksum University in all zones and woredas for a period of three months. A base line study using cross-sectional survey supplemented by key informant interviews and focus group discussions was conducted. A single pre-test assessment was made before the survey. The study was conducted to determine the overall socioeconomic status of the region in including health service access, utilization, maternal health services, child health and environmental health at household level. The study was conducted among 12316 households supported by - key informants and - focus group discussants. Quantitative data was analyzed using descriptive statistics and presented in the form of tables and text using Stata12 software. The baseline study confirms that regional health bureau and its line offices in the region had been exerted efforts to improve health of the community, child and maternal health, awareness creation, and environmental health related issues. Using the program they succeeded in changing the health condition of households in relation to antenatal care, delivery, postnatal care, health extension programs, community based health insurance, harmful traditional practices and maternal health. However, this does not mean that attaining improvements in health services in the region in general is simple and straightforward looking data in the socioeconomic survey. Still there are only 48.44% mothers with four or more antenatal follow-up, 32. 18% home delivery, only 54.15% post natal attendance for at least once, environmental sanitation (low waste management practices and latrine coverage), low coverage of community based health insurance 32.47%, child and maternal health related services, weak health extension and women development army

activities. This baseline study would give many lessons to be learned from the experience in the ground for the regional government of things to be addressed. Example health extension workers and women development army members should regularly visit and help communities to trust the availability of the services. Besides, health facility and offices should work on antenatal, delivery, post natal, vaccination, family planning, community based health insurance, environmental sanitation and harmful traditional/beliefs surrounding health service utilization in general and child health and maternal health in particular. Moreover, the existing lack of visit to some of the households by health extension workers should be revisited as most of the services given to communities are most covered by grass root health cadres. The researcher believes that looking in to the results and talking the constraints would enable the region to work at its full potential to boost health service utilization at large scale.

# 1. Introduction

## 1.1. Background

Ethiopia has long-standing history, diverse cultural heritage, and reasonably good resource potential for development. Yet, due to internal and external factors, the country has remained to be plugged into deep and complex economic structural problems. Especially, by the turn of the 1990s economic policies and management under the command economic system, protracted civil war and recurring drought left the economy in deep crisis which manifested itself, among others, in weak economy where growth plunged in most of the years and accompanied by loss of productive capacity, competitiveness, and increased food insecurity, severe macroeconomic imbalance and instability, and social crisis involving millions of displaced persons, refugees, demobilized soldiers, homelessness and unemployed people.

In addition to the misguided economic policies and the aftermath of these policies, since, almost the major battle fields were in the northern part of the country, specifically in Tigray region. These battles had left deep scar in the region. First, it has left serious crisis, such as deeply rooted poverty, environmental degradation, and recurrent drought; and its effects sustained until the present. Second, the continuous war /conflicts, for almost two decades (considering only the recent ones) have ravaged the economic and social infrastructures, and in return undermined development effort of the region. Third given the hostile environment and poor infrastructural condition have increased the perceived risks of doing business in the region. As a result, it is expected that the private investment flows to be exceptionally low, compared to national average.

When the Ethiopian Peoples' Revolutionary Democratic Front (EPRDF) came to power in 1991, it inherited a weak command economy characterized by fiscal and current account deficits amounting to 8.7 per cent and 6.9 per cent of Gross Domestic Product (GDP) respectively, in addition to an external debt burden equivalent to 33 per cent of GDP, poverty level was above 50 percent. Recognizing the need for to create an enabling environment for accelerated development and attainment of improvements in the standards of living of the people, in the absence of proactive development policies, the then Transitional Government of Ethiopia (TGE) initiated a broad spectrum of reform measures to address both the immediate need of economic recovery

and reconstruction to jump start the economy as well as the long-term structural problem of underdevelopment. Moreover, to create conducive macroeconomic situation and build the confidence of the private sector, which was frustrated and stunted by the command economic policy, the EPRDF, embarked on far-reaching reforms, so as to achieve broad-based economic growth in a stable market economy. Price controls and subsidies were removed and the exchange rate was devalued by 250 per cent. The financial services sector was also opened up to competition from the domestic private sector. Equally, regulations were put into place to encourage the participation of both domestic and foreign investors, particularly in agriculture and agro-processing. These reforms were underpinned by increased pro-poor public spending in agriculture, education, health, water, roads, rural electrification, and telecommunications.

For some countries, entrenched in the trickled-down hypothesis, economic growth is the primary policy goal, and poverty reduction is to be achieved through measures complementary to growth. This is not the approach of the Ethiopian government. Poverty reduction is the core objective of the Ethiopian government. Economic growth is the principal, but not the only, means to this objective. Accordingly, the Ethiopian Government adopted a policy framework called Agricultural Development Led Industrialization Strategy (ADLI), which provided the long-term development framework for economic transformation of the country. The special features of ADLI in the context of Tigray region, was its emphasis on natural resource conservation and rehabilitation based Agricultural Development Led Industrialization Strategy (ADLI).

Due to the change of economic (from centralized into free market economic system) and overall political stabilization in the country the economic growth of the country for the first time started to register a positive growth rate trend. To sustain and deepen the economic growth long-term development programs were launched following the stabilization phase.

The first medium term development program was called Sustainable Development and Poverty Reduction Program (2002/03-2004/05), and Plan for Accelerated and Sustained Development to End Poverty (2005/06-2009/10) were launched consecutively. As a result, following the reforms and stabilization packages, especially in the last fifteen years, impressive economic growth has been registered. According to the economist (January 6, 2011), the country had the 5$^{th}$ fastest growing economy in the world during the periods 2012-2015, with an average annual GDP

growth rate of 10.1%. Similarly, as per the official report of the Ethiopian government, the poverty level was reduced to 29 % by the end of 2010/2011; from its 54% level in 1991. Capitalizing on the experience of the preceding programs and incorporating new development perspectives, such urban and industrial development, the Ethiopian government has launched the first (GTP1) (2010/11-2014/15), and second five year Growth and Transformation plan 2015/16-2019/20) were introduced. By the end of the Growth and Transformation Plan-I (2010/11-2014/15), the head count poverty level was reported to be around 18% at national level. Despite such impressive economic progress, still the economy is suffering from high level of youth unemployment, high level of economic inequality, high population growth rate and aggressive urbanization.

As it is indicated in the GTP-II five year plan of Tigray, to increase the socio-economic levels, the primary focus shall be on creating conducive environment for the new micro and small scale enterprises and promoting the existing ones into manufacturing enterprises. Similar developmental activities shall continue in other sectors, especially in agricultural sector. Thus, there shall be job creation programs that are intended to support female and youth who are the main victim of the problem. There is a plan to increase the share of micro and small scale enterprises (MSEs) in the regional industry income which is projected from 3.89% to 8.9% (BoPF, 2015).

By implementing these and other major developmental interventions, the region has planned to reduce unemployment rate in the coming 5 years. The unemployment rate which was 17% in 2014 and this shall decline to 10% by the end of GTP-II period. According to the available data the national level of unemployment rate was reported to be 20.5% in 2009 and forecasted to decline to 16.9% in 2016 (CSA, 2016).The level of unemployment for Tigray region, especially for major urban areas, such as Mekelle is expected to be higher than the stated rate. According to BoPF report (2017/18), the unemployment rate in the region was 17.86%; urban, 23.44%; rural, 9.78%. Moreover, in the region, the GDP growth rate was 8.88% and 9.84% in 2016 and 2017 respectively (BoFP, 2016/17).

Understanding the importance and urgency of the matter, Tigray Regional State has commissioned socio-economic survey. Regarding the stated growth rates and level of poverty

reduction, due the structural problem in the country's information management system, mainly due to low level of attention to socio-economic data management system, deliberate data manipulation, and low level of technical capacity in data analysis; the reports should be taken with precaution. Hence, once policies and strategies are designed and implemented the next logical step in the policy design, implementation, and evaluation cycle is to get the feedback as how things are unfolding. For instance the data regarding status of poverty, level of health, education, and generally access to social and economic infrastructure, has to be collected, and analyzed by independent body. Equally, to design effective policies and strategies to reduce poverty, it is critical to understand its characteristics: distribution (in terms of spatial and societal groups-gender, youth, ethnic groups, occupation, etc.), intensity and magnitude. Hence, well-documented and analyzed data can inform policy makers on whether poverty is increasing or decreasing and generally to see whether economic growth is benefiting the poor or not. With good poverty data, the effects of government policies on the poor can be evaluated, and the growth strategies that have a better chance and efficiency in benefiting the poor can be identified and promoted.

## 1.2. Rationale

Reliable socio-economic statistics describe the reality of people's wellbeing at the grass-root level. The reality of people's wellbeing, in turn will serve as input towards the regional development plan and prioritization of resource allocation. Timely, complete, accurate and reliable statistics is critical for creating and sustaining an environment which fosters strong, equitable development. Also, this is an essential ingredient for formulation of sound economic development policies, by which the decision making and development plans of the government becomes concentric. Especially, in the context of developing countries, where the role of Governments is very strong such type of data are very instrumental. The regional economic policies and complex interactions among various sectors of the economy make it imperative for building up regional income accounts. This kind of accounts is only possible with availability of timely and reliable statistical information. Thus, statistics plays a vital role to attain national/regional development goals based on the availability of timely and reliable statistical indicators such as demographic, agricultural production, poverty headcount, income per capita, labour force, housing, schooling, health outcomes, etc.

Further, timely, accurate and reliable statistics are widely used for the design and implementation stages of long-term regional policy frameworks. It is increasingly important to have high quality statistics on the population and projections of the population, for policy development and for planning and providing public services. This information is used for: woreda and zonal finance allocation; housing planning; health care planning; providing education facilities; and making comparisons with national and international benchmarks.

Unless accurate and reliable statistics socio-economic baseline data is there, monitoring of development programs and establishing whether planned targets have been achieved or not cannot be ascertained. This is another area where statistics plays an important role. In monitoring and evaluation of ongoing economic interventions data is vital, as it provides the necessary information on performance indicators which serve to measure the impact of policy and programmes on the quality of life of target populations. Thus, statistics on these issues serves as monitoring indicators which are vital for development plans. Hence, the initiatives taken by the client (Bureau of Finance and Planning) to create a reliable socio-economic baseline data for all woredas is a timely decision.

## 1.3. Objectives of the study

***General objective***

The general objective of this study is to assess the socio economic baseline data of Tigray Regional State.

***Specific objectives***

- To collect, organize, analyze and interpret household level socio-economic data covering all rural, and urban woredas of Tigray Regional State.
- To estimate the level of poverty of the region using uni-dimensionally (head count, poverty gap, squared poverty gap indexes) and identify the determinants of poverty.
- To generate baseline data of social and economic infrastructures (roads, water, health institutions, etc).
- To estimate the income distribution between urban and rural areas (state of income inequality).

### 1.4. Scope and coverage

The survey is a base line socio-economic survey for the region of Tigray and it aims at producing baseline information about different socio-economic (demographic and household characteristics, housing condition, poverty, income/expenditure, wealth, education, agriculture, water supply, sanitation and hygiene, health and access to public utilities, market and milling services, financial service, household food security and coping mechanisms, environmental degradation etc.) in the region. The study covers all rural werdas and 18 administrative towns of the region. The survey is undertaken on sample of households taken from each wereda and administrative towns of the region.

### 1.5. Significance of the study

This research will help to formulate essential bases in designing and setting up long term development programs to address the gaps and inequalities in terms of poverty (income) and social service distribution among households and localities. It is also expected to serve as input in the development of annual sectoral plans; and as baseline data for impact assessment of different policy interventions on households' welfare in the future. It will also help to show the level of distortion, by comparing the current report (which is more reliable) what was used to be reported. Moreover, this report can have far reaching in the national debate in Federal Budget Subsidy discussion and other international donor partners.

## 2. Methodology

### 2.1. Study Area

This research was conducted in Tigray region, Ethiopia. Tigray Region is one of nine regional states of Ethiopia located at latitudes from $12^0$ 14'50.50" to $14^0$ 53'48.03" and longitudes from $36^0$ 26'48.74" to $39^0$ 59'0.09". Tigray Region is the homeland of the Tigray, Erob and Kunama people. The state of Tigray shares common borders with Eritrea in the north, the State of Afar in the east, the State of Amhara in the south, and the Republic of the Sudan in the west. The region is divided into 5 zones, 53 woredas (districts) and 814 tabias (sub-districts). According to the 2016/17 projection of CSA the state's population size was 5,247,005 with an estimated area of 54,593 square kilometers. Most (73%) of the population live in rural, while 27% are urban

dwellers. In terms of religion 95.5% of the population are Orthodox Christians, 4.1% and 0.4% are Muslims and Catholics respectively. Regarding ethnic composition, 94.98% are Tigraway, 2.6% Amhara, 0.7% Erob and 0.05% Kunama. Tigrigna is the working language of the state. About 83% of the populations are farmers. Teff, wheat, and barely are the main crops. Other agricultural products include beans, lentils, onions, and potatoes. Irrigation and terrace farming are used on the steep slopes. The region is also known for its export items of cotton, incense, sesame and minerals.

## 2.2. Study Period

The survey was conducted from April to June 2018, a total of 3 months. Additional two months for translating the final report to Tigrigna. So, the study was conducted for about five months.

## 2.3. Research design

Across-sectional study using mixed research design (both quantitative and qualitative methods) was conducted in order to collect the data concerning various socio-economic household characteristics in Tigray Region, Ethiopia. Under the qualitative approach challenges and opportunities of the social-economic were discussed. The qualitative data was collected using key informant interview (KII) and Focused Group discussion (FGD).

## 2.4. Population and sampling frame

The population of this study was all households in all woredas and urban administrations of Tigray regional state. The survey was designed to consider tabias and kebelle as primary sampling unit and households as secondary sampling unit. The sampling frame for the primary sampling unit was all list of tabias/ kebelle in rural woredas and all lists of kebelles in urban administrations of the region. The sampling frame for the secondary sampling unit was the list of all households in the selected tabias/kebelle of the region.

## 2.5. Sample size determination

The survey sample size was determined by using a single population proportion formula. The sample size determination formula is:

$$n = \frac{\left(Z_{\alpha/2}\right)^2 p(1-p)}{(e)^2}$$

where, n=required sample size, p is proportion, e=the level of precision or acceptable error. Thus, using 95% confidence interval with 1% level of precision, design effect 1.5 and using 90% housing ownership from ERSS (2013) in the above formula, the total sample size of the survey at woreda level was 208 households. We Considered 10% none response rate (21), the final sample was 229 households. Thus, the minimum sample size for each woreda was 229 households. As there are 52 woredas in Tigray region, the total sample survey for the region was 11,908 households.

## 2.6. Sampling technique

For the purpose of this study the region was categorized in to two categories: urban and rural. This survey was conducted in all zones and all woredas of Tigray region state. A multistage sampling technique was employed to select the 11,908 households using systematic random sampling method. Of these 7,786 households were selected from rural woredas, and 4,122 households were drawn from urban administrations. In this study all the rural woredas and urban administrations were included in the sample. The minimum total sample size to each woreda was 229 households.

### *i)Selection of Households from Rural Woredas*

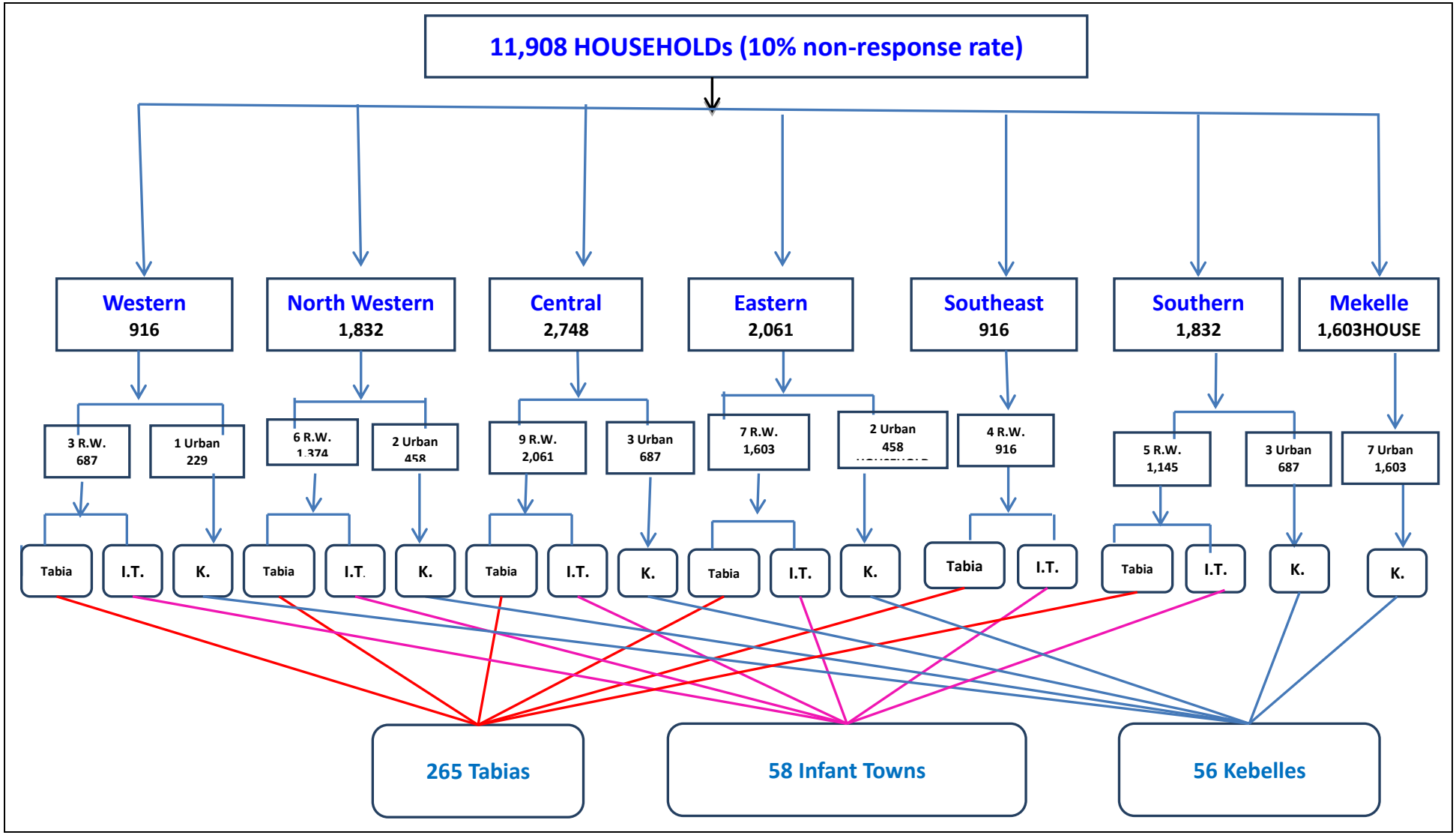
A multistage random sampling strategy was employed. The rural woredas were divided into two categories namely with tabias and infant towns. Further, tabias were stratified/categorized in to three agro-ecological zones (Kola, Dega, and weyna Dega). Using simple random sampling two tabias were selected from each agro-ecologically zones. A representative sample size of 265 tabias and 58 infant towns were selected randomly from rural woredas and 114 infant towns, respectively. The primary sampling units (PSUs) were tabias and infant towns.

At the second stage, the required number of households per selected PSUs was randomly chosen. Households were selected from the selected 187 tabias and 34 infant towns based on systematic random sampling (SRS) technique proportion to the size of population (PSP). Thus, total sample

of 7,165 households were selected from rural woredas. The list of households was obtained from tabia administration office.

***ii) Selection of Households from urban administrations***

In the study area there are 18 urban administrations, composed of 45 kebelles and 7 sub cities (33 kebelles), all were included in the study. The total number of kebelles across all urban administrations of the region including the 7 sub cities of Mekelle is 104. A representative sample size of 56 kebelles was selected randomly from 104 kebelles. The primary sampling unit was households. By using systematic random sampling technique, sample households were drawn randomly from each selected kebelle after allocating proportionally. The list of households was obtained from the kebelle administrations.




**N.B.** ***R.W. =Rural woreda, IT=Infant towns, K=Kebelles***

**Figure 2.6. 1: sampling procedure for socio-economic baseline survey in Tigray region.**

## 2.7. Quantitative data collection tools and type of data

The survey was employed household structure questionnaire method, whereby a set of data was collected at the household level using structured questionnaires. The baseline survey was designed to capture key household-based variables on which the socio-economic base line survey is expected to make a considerable impact in the short and long run in the region.

Quantitative data was collected, using Smartphone where the data collection tool was installed, by trained data collectors. The questionnaire was first prepared in English, and then it was translated in to local language (Tigrigna). Server computer was established at Mekelle University, where Structured Query Language (SQL) server was installed and the backend database was created. All mobile phones were had connection to the server computer. The connection was through Ethio Telecom. The mobile phones were GPS installed to control the quality of data; to check from where the data is coming which phone is sending. On the phone we were included restrictions in order to minimize data incompleteness and control out of range data (continuous data). The collected data was directly stored in a central data base of Mekelle University's server.

### 2.7.1. Study variables

The variables that were included in this survey were:

**Household Basic Information:** age, sex, education, residence, migration, disability, marital status, family size by gender, occupation by gender, income etc.

**Household Assets:** livestock and house items, type of household dwelling unit, sources and types of energy used, etc.

**Food Security and Nutrition:** number of food secure months, Nutrition and food consumption patterns, temporal distribution of the onset and end of the annual food shortage period, causes of and coping mechanisms against food shortage, etc.

**Health and nutrition:** child birth and death, pre and postnatal care, health status, harmful practice, etc.

**Housing conditions and access to public utilities**: housing and public utilities, sanitation service, etc.

**Agricultural Systems and Farming Practices:** major agricultural challenges facing households, cropping systems, land ownership regime, agricultural inputs, production and sale of crop produce and other sources of household income.

**Water supply:** availability of water, source of water, water use, amount of water, distance from water resource, role, etc.

**Irrigation:** availability of water, source of water, size of land, technology, years of experience, income from irrigation, etc.

#### 2.7.2. Quantitative data collection and Quality

The core team recruited enumerators who have work experience in conducting similar surveys with a minimum of a BSc degree, and who speak the local and national language. Participation in the training was a prerequisite for employment in the field work, and, therefore, the core team invited those selected to participate in the training. The lead investigators were take full responsibility for training the enumerators in the step-by-step procedures for conducting the field work. The training was led by the core survey team members and it was followed by the field testing of the survey instruments.

The training sessions covered every aspect of the survey on the socio-economic and the full range of skills involved. To this end, an intensive six days training session, plus 2 days pre-test and 1 day feedback (nine days in total) were organized for enumerators and the field supervisors. During the training sessions the following key topics related to the survey were covered:

- The objectives of the regional survey;
- Organization of the survey team and division of responsibilities;
- Question-by-question training for enumerators on the questionnaires and all Standard Operating Procedures that must be followed;
- Procedures of managing survey logistics
- Lines of communication within the core team during the fieldwork;
- Demonstration/exercise of mobile based data collection system

The training workshop was also used for pre-testing and fine tuning the data collection tools and the use of the electronic data collection system. Before the start of fieldwork, the questionnaires were pretested to make sure that the questions were clear and could be understood by the respondents. Thus, the data collection team was taken out to the field for field testing the tools. The team

adapted the questionnaires/tools to the local context in order to maximize the validity and reliability of questionnaire items. Moreover, the field test allowed for any necessary adjustments on questionnaires and logistics to be made in order to maximize the quality and efficiency of data collection activities. All revisions were made in plenary sessions after the pre-test and the final questionnaires installed in the all mobile and made ready for the survey before starting the field work. Furthermore, role plays for the in-depth interviews and group discussions were entertained in the training. Moreover, field manual was developed by the core team in collaboration with Tigray Regional State Bureau of Plan and Finance. The manual was prepared in such a way that that every data collector can understand its content and can use it as a quick reference after the training and during the field works.

### 2.7.3. Quantitative data analysis

The analysis of this study was conducted using computer software STATA version 14. Because of the nature of the study the data was dominated by descriptive analysis. Descriptive statistics were computed to explore the socio-demographic, socio-economic, and other related household characteristics. Categorical variables were reported as percentages.

To identify key determinants of poverty; we first computed principal components analysis to create an asset (poverty) index which give the social economic status of each household (poor or noon-poor). That is,

$$\text{SES} = \begin{cases} 1, & \text{If household is poor} \\ 0, & \text{Otherwise} \end{cases}$$

where SES denotes social economic status.

Then, a logistic regression model was employed. The logistic regression model is used to indicate household's attributes correlated with the high risk of being poor. The variable explained in the model is dichotomous, taking a value of one when the household is poor and the value of zero otherwise. The general logistic regression model is given by:

$$\text{logit}(p_i) = \ln\left(\frac{p_i}{1-p_i}\right) = \beta_0 + \beta_1 X_{1\text{i}} + \beta_2 X_{2\text{i}} + \cdots + \beta_{\text{k}} X_{\text{ki}},$$

where $X_{1\text{i}, \ldots,} X_{\text{ki},}$ are the predictor (independent) variables for the $i^{\text{th}}$ household, and $p_i$ denoted the probability that the $i^{\text{th}}$ household is poor.

## 2.8. Qualitative approach

### 2.8.1 Qualitative data collection

The qualitative approach was used to explore the opinions, feelings, and perceptions of the participants regarding socio-economic. A purposive sampling technique was used in order to select potential participants who can share their unique slice of reality about the context regarding socio-economic study. The duration of stay in the specific locality, being familiar to the members of the community and the level of awareness were among the criteria used for recruiting the participants to be involved for Focus Group Discussions (FGDs) and key informants (KIIs).

### 2.8.2. Qualitative data analysis

The qualitative data obtained through FGDs with community representatives; and KIIs drawn from the different sector offices were analyzed and presented in a descriptive way. The data was thematically analyzed using well defined categories and contents. Since analysis software such as Atlas-ti and Nvivo were not available for us, the researchers pursued a narrative approach based on saturated data gained from 12 FGDs and more than 8 key informant interviews in all representative woredas from urban, infant towns and rural locations. Results of the qualitative data were used to support quantitative analysis and interpretation in the report.

## 2.9. Response rate

Table 2.9.1 shows household response rates according to residence. Twelve thousand and three hundred fourteen households were successfully interviewed, yielding a household response rate of 103.4 percent. Due to the non-proportional allocation of the sample to the woredas, sampling weights are used for analyzing the data to ensure the actual representativeness of the survey results at the woreda level. Whenever applicable, both weighted and unweighted percent are used in the tables of this report.

**Table 2.9. 1: Results of the households selected and number of households interview, and response rates, according to residence (unweighted).**

| Result | Residence | | Total |
|---|---|---|---|
| | Urban | Rural | |
| Households selected | 4,122 | 7,786 | 11,908 |
| Households interviewed | 4,170 | 8,144 | 12,314 |
| Household response rate | 101.2 | 104.6 | 103.4 |

# 3. Results and discussions

## 3.1. Demographic Characteristics

In the following sections, attempts will be made to present demographic data and compare household and population characteristics across several parameters such as age, family size and sex distribution, marital status, ethnicity, religion, and source of income. Comparison will be made along household place of residence ranging from urban areas to infant towns and pure rural locations with aggregate figures given at a regional level as well.

### 3.1.1. Sex distribution of household heads

Data on sex of household heads gives an account of who takes part in taking care of family members and the workload assigned to male and female prime responsibility holders along the kinship unit. It also has far reaching impacts on the social and economic status of the household. For example, it has been reflected in many of the literature that women-headed household without adult male labor face a lot of challenges in the rural areas for several reasons. The following table shows the sex distribution of households at all levels.

**Table 3.1. 1**: Distribution of Household heads by Sex

| Sex of households | Urban | Infant town | Pure rural | Regional |
|---|---|---|---|---|
| Male | 56.65 | 63.13 | 73.64 | 66.45 |
| Female | 43.35 | 36.87 | 26.36 | 33.55 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 |

(Socio-economic baseline survey, 2018)

As indicated in the above table (table 3.1.1), there was a dominant proportion of men household heads particularly in rural locations (i.e. 73.64%); while the proportion of women household heads in urban areas is not significantly lower, possibly because of mobility or divorce which is more common in the towns.

### 3.1.2. Age of population

Data on the age categories of the entire population in surveyed households are an important aspect of the demographic characteristics because they provide basic information about the distribution of people across the different socio-economic classes: children, youth, middle age and old. This helps development planners identify specific needs of citizens and allocate appropriate amount of resources. The following table (table 3.1.2) provides information on the age categories of household

**Table 3.1. 2:** Population distribution by age categories

| Age categories | Urban | | Infant towns | | Pure rural | | Region | |
|---|---|---|---|---|---|---|---|---|
| | Un weighted | Weighted | Un weighted | Weighted | Un weighted | Weighted | Un weighted | Weighted |
| <5 years | 31.61 | 31.39 | 14.52 | 14.29 | 53.87 | 54.32 | 9.99 | 9.93 |
| 5-9 | 27.44 | 27.09 | 14.42 | 14.12 | 58.14 | 58.79 | 11.17 | 11.16 |
| 10-14 | 26.97 | 26.85 | 14.60 | 14.47 | 58.43 | 58.68 | 12.33 | 12.38 |
| 15-19 | 31.25 | 31.36 | 13.33 | 13.27 | 55.42 | 55.37 | 11.46 | 11.52 |
| 20-24 | 37.26 | 37.53 | 11.64 | 11.67 | 51.11 | 50.79 | 9.24 | 9.22 |
| 25-29 | 40.11 | 40.54 | 12.70 | 12.36 | 47.19 | 47.09 | 7.28 | 7.23 |
| 30-34 | 38.083 | 37.82 | 14.15 | 13.89 | 47.77 | 48.29 | 6.29 | 6.26 |
| 35-39 | 35.50 | 35.77 | 14.62 | 14.14 | 49.88 | 50.08 | 6.26 | 6.26 |
| 40-44 | 32.69 | 32.31 | 14.09 | 14.14 | 53.22 | 53.55 | 5.49 | 5.48 |
| 45-49 | 29.87 | 30.035 | 13.14 | 12.99 | 56.99 | 56.97 | 4.80 | 4.87 |
| 50-54 | 29.54 | 30.50 | 12.90 | 12.60 | 57.56 | 56.90 | 4.045 | 4.09 |
| 55-59 | 29.03 | 29.10 | 11.31 | 10.90 | 59.65 | 60.00 | 2.82 | 2.84 |
| 60-64 | 29.70 | 30.66 | 11.15 | 11.23 | 59.16 | 58.11 | 2.73 | 2.72 |
| 65-69 | 29.54 | 30.14 | 9.78 | 9.58 | 60.69 | 60.28 | 2.11 | 2.10 |
| 70-74 | 28.75 | 28.95 | 8.91 | 9.10 | 62.34 | 61.95 | 1.67 | 1.68 |
| 75-79 | 27.77 | 29.11 | 12.53 | 12.68 | 59.71 | 58.21 | 1.02 | 1.02 |
| 80 and above | 29.00 | 29.35 | 12.17 | 12.63 | 58.83 | 58.02 | 1.28 | 1.24 |
| Total | | | | | | | 100.00 | 100.00 |

(Socio-economic baseline survey, 2018)

As indicated in table 3.1.2 above, over 61% of the population falls under the age of 30 years which is often known as economically active group. This calls for government attention on the youth in terms of development activities and creating opportunities. Youth based interventions are therefore likely to benefit the entire population. Of the total number of children that are under the age of 5, only 31.61% are found in urban areas while the bulk majority live in rural settlements and infant towns (54.32% and 14.29 % respectively). The elderly (i.e. age 75 and above constitute less than 3% of the entire population at the regional level.

### 3.1.3. Family size

Family size of households in a given population is also an important parameter that clearly shows birth and fertility status which is a function of many interconnected social, economic and cultural factors. There are variations in the average number of children in urban and rural locations. Recent CSA national report (CSA 2017) for example puts the country's average

household size in rural, small town and large town areas as 5.2 and 4.3 and 3.7 persons per household respectively. Accordingly, the average household size in Ethiopia is 4.8 persons, while the figure for Tigray was reported to be 4.6 (ibid, 2017).

The following table (Table 3.1.3) provides information at a regional level as well as in rural and urban locations of Tigray region.

**Table 3.1. 3:** Distribution of households by family size

| family size | Households | | |
|---|---|---|---|
| | Region (%) | Urban (%) | Rural (%) |
| 1 | 6.73 | 7.79 | 6.18 |
| 2 | 11.43 | 12.81 | 10.72 |
| 3 | 16.83 | 19.74 | 15.34 |
| 4 | 18.35 | 20.50 | 17.24 |
| 5 | 16.13 | 16.67 | 15.86 |
| 6 | 12.96 | 11.44 | 13.74 |
| 7 | 8.99 | 6.76 | 10.13 |
| 8 | 5.06 | 2.35 | 6.45 |
| 9 | 2.40 | 1.22 | 3.00 |
| 10 | 0.76 | 0.50 | 0.90 |
| 11 | 0.28 | 0.12 | 0.36 |
| 12 | 0.07 | 0.10 | 0.06 |
| 13 | 0.01 | -- | 0.01 |
| 14 | 0.01 | -- | 0.01 |
| 15 | 6.73 | -- | 6.18 |
| Total | 100.00 | 100.00 | 100.00 |

(Socio-economic baseline survey, 2018)

With regard to regional figures, table 3.1.3 above shows family size of sample households of the socio-economic base line survey with most households (75.7%) having family size ranging from 2 to 8.

Among urban households, most households tend to have a family size of between 2 and 6. It looks evident from the above data that households avoid having large family size. As a result, we see a sharp decline of the number of household having family size of 6 and above. This could be because of increasing awareness and efforts to disseminate family planning mechanisms.

Similarly among rural households, the table indicates that most of the households (over 81%) have family sizes ranging between 2 and 6). Those having more than 8 are less than 2%.

**3.1.4: Marital status**

Marriage and family responsibilities are useful features of the demographic characteristics because they are pertinent to family size as well as social and economic status of households. The age at which people establish their own independent families has its own ramifications for family planning activities which is an important aspect of national and regional decision making for integrated development.

The following table (table 3.1.4.) gives information at regional, urban, rural and infant town levels. The regional figures in table 3.1.4 clearly demonstrate that only less than 7% of the male and female household heads were never married while over 85.3 % of the male households were married; however, the proportions of divorced and widowed women household heads were also found out to be high (35.38% and 33. 85% respectively).

The majority of those that are never married are found in urban locations (68.64% for men and 71.26 for women); while nearly 50% of the widowed women are found in rural areas; the same holds true for men (52%).

**Table 3.1. 4:** Distribution of household heads by marital status

| Marital status | Region (%) | | | | Urban (%) | | | | Infant towns (%) | | | | Rural (%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Un weighted | | weighted | | Un weighted | | Weighted | | Un weighted | | weighted | | Un weighted | | Weighted | |
| | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female |
| Never married | 6.79 | 6.68 | 6.98 | 6.34 | 66.67 | 69.88 | 68.64 | 71.26 | 12.19 | 10.04 | 10.1 | 9.58 | 21.15 | 20.08 | 21.25 | 19.16 |
| Married | 85.55 | 16.05 | 85.3 | 15.16 | 58.9 | 45.18 | 59.17 | 45.67 | 27.91 | 16.4 | 27.76 | 16.03 | 13.19 | 38.42 | 13.07 | 38.3 |
| Widowed | 3.6 | 36.09 | 3.6 | 33.85 | 33.11 | 36.88 | 37.84 | 37.19 | 12.16 | 13.08 | 9.46 | 13.21 | 54.73 | 50.04 | 52.7 | 49.61 |
| Divorced | 3.23 | 31.32 | 3.33 | 35.38 | 38.35 | 30.23 | 39.42 | 41.62 | 18.8 | 19.03 | 17.52 | 15.66 | 42.86 | 50.74 | 43.07 | 42.72 |
| Separated | 0.83 | 9.86 | 0.78 | 9.26 | 41.18 | 42.93 | 50 | 43.57 | 23.53 | 23.04 | 21.88 | 24.41 | 35.29 | 34.03 | 28.13 | 32.02 |

(Source: Socio-economic baseline survey, 2018)

### 3.1.5: Ethnicity

Ethnicity is a key marker of regional identity besides religion; and plays its own role in social capital building and community mobilization especially in the wake of current multi-cultural policies of the country. Hence, there is a need for identification of major ethnic groups found in the Tigray region and keep official statistics of the dynamics.

The following table (table 3.1.5) contains data on the ethnic distribution of households

**Table 3.1. 5:** Distribution of households by Ethnicity

| Ethnicity | Region (%) | Urban (%) | Infant towns (%) | Rural (%) |
|---|---|---|---|---|
| Tigraway | 96.90 | 97.24 | 95.97 | 95.97 |
| Amhara | 1.24 | 2.16 | 1.66 | 1.66 |
| Kunama | 0.05 | 0.05 | -- | 2.02 |
| Erob | 1.54 | 0.29 | 2.02 | 0.12 |
| Agew | 0.12 | 0.02 | 0.12 | 0.06 |
| Afar | 0.01 | 0 | 0.06 | --- |
| Oromo | 0.11 | 0.19 | 0.12 | 0.12 |
| Others | 0.03 | 0.05 | 0.06 | 0.06 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 |

(Socio-economic baseline survey, 2018)

At a regional level, 96.9% of households belong to the Tigraway ethnic group. Non-Tigraway represent only 3.1% of the households surveyed desiring the socio-economic baseline study.

Among urban households, an overwhelming majority of sample households (97.24%) have Tigraway ethnic background. Other ethnic groups were found out to be a minority in the Tigray region. The second largest is Amhara but the proportion is negligible (only 2.16%). The region still maintains its homogeneity despite the rights of people to live everywhere within the country's borders as per the national constitution. Mobility into Tigray from other regional states especially in the form of permanent settlements is still rare and far between.

In a similar trajectory, among rural households, it is evident from the above table that the Tigray regional state mirrors homogeneity in terms of its ethnic composition as over 96% of surveyed household belong to the Tigraway ethnic identity; while less than 4% of them belong to various other groups with Erob or Saho speaking communities taking the lions share (2.17%). Factors that have contributed to curtailed movement of members of other ethnic groups into Tigray warrants a separate study but certain social and economic features might be responsible.

### 3.1.6: Religion

Religion is an important mobilizing factor that can be used to build social capital in a given area. Dynamism in religious characteristics entails changes in owns own identity over a period of time. According to a recent CSA report (CSA 2017), the majority (96.4%) of the populations was found to be followers of the Orthodox Christianity; while the proportion of Muslims was 3.3% (ibid, 2017). Table 3.1.6 below shows the distribution of household heads or associates by religious background.

**Table 3.1. 6:** Distribution of household heads by religion

| Religion | Region (%) | Urban (%) | Infant towns (%) | Rural (%) |
|---|---|---|---|---|
| Orthodox | 94.53 | 94.03 | 94.19 | 94.95 |
| Catholic | 1.44 | 0.38 | 1.72 | 2.04 |
| Protestant | 0.04 | 0.12 | -- | -- |
| Other Christians | -- | -- | -- | -- |
| Muslim | 3.98 | 5.44 | 4.09 | 3.01 |
| Other | 0.01 | 0.02 | -- | -- |
| Total | 100.00 | 100 | 100.00 | 100.00 |

(Socio-economic baseline survey, 2018)

Table 3.1.6 above indicates that at a regional level, 94.53% of the households covered by the socio-economic baseline survey were followers of Orthodox Christianity. Muslims constitute 3.98% of the regional total.

Among urban households, most of the respondents (over 94%) were followers of orthodox Christianity followed by Muslims (5.44%). Other denominations of Christianity such as Catholics and Protestants combined represent 0.5% of those households that have been included in the current socio-economic baseline survey. These proportions generally reflect the situation for the entire Tigray regional state administration.

As witnessed from the above table, among rural households also, orthodox Christianity has dominated in Tigray region for many years now as previous CSA reports also point to the same reality. Over 94% are followers of this form of Christianity while Muslims are still a religious minority in the region, with a figure of a little over 3.2 %. Other denominations of Christianity, Catholicism in particular makes up less than a little less than 2 % of the surveyed households.

### 3.1.7: Source of income

The source of income reflects economic arrangements of members of households at various levels. The activities show livelihood mechanisms that are helpful for future regional interventions in terms of identifying top priorities and allocating proper resources to the development of the most crucial sector of the economy. Income parameters reflect the present occupational status of the population in Tigray region. Such occupational status and income source is affected by social mobility. It is therefore important to show the track changes over time. The following table (table 3.1.7.) provides information on the most dominant livelihood engagements that are pivotal to the survival of the population.

**Table 3.1. 7:** Distribution of households by source of income

| Source of income | Urban | | Infant towns | | Rural | | Region | |
|---|---|---|---|---|---|---|---|---|
| | Un-weighted | Weighted | Un-weighted | Weighted | Un-weighted | weighted | Un-weighted | weighted |
| Business | 3.73 | 3.64 | 1.73 | 1.73 | 0.4 | 0.44 | 1.08 | 1.34 |
| Private | 7.13 | 6.96 | 14.60 | 14.30 | 3.44 | 3.55 | 5.83 | 8.53 |
| female household business | 12.67 | 12.36 | 6.92 | 6.90 | 1.82 | 1.82 | 4.12 | 5.21 |
| civil servant | 17.93 | 17.50 | 9.41 | 8.76 | 1.79 | 1.75 | 5.23 | 6.31 |
| public enterprise employee | 1.87 | 1.82 | 0.46 | 0.64 | 0.09 | 0.08 | 0.39 | 0.44 |
| international organization employee | 10.4 | 10.15 | -- | --- | - | -- | 1.38 | 1.09 |
| private enterprise employee | 1.27 | 1.23 | 1.83 | 3.12 | 0.32 | 0.33 | 0.71 | 0.99 |
| service cooperative employee | 0.8 | 0.78 | 0.15 | 0 | 0.03 | 0.10 | 0.15 | 0.12 |
| daily worker | 26.4 | 25.76 | 7.02 | 16.08 | 3.87 | 3.76 | 7.35 | 10.09 |
| domestic worker | 7.53 | 7.35 | 0.51 | 0.38 | 0.76 | 0.79 | 1.60 | 1.35 |
| Agriculture | 5.13 | 5.01 | 52.75 | 43.40 | 85.55 | 85.63 | 68.34 | 60.24 |
| Pensioner | 1.2 | 1.17 | 1.63 | 1.69 | 0.46 | 0.46 | 0.76 | 1.43 |
| child, helping with domestic and other | 3.93 | 3.84 | --- | --- | --- | --- | 0.52 | 0.41 |
| Others | 7.93 | 7.74 | 3.00 | 2.99 | 1.44 | 1.38 | 2.56 | 2.45 |

(Socio-economic baseline survey, 2018)

As per the above table, the figures clearly demonstrate that over 85% of the households that were engaged in farming and livestock husbandry live rural areas. Agriculture and mixed farming hardly leave spare time for other engagements so much so that even casual work accounts for only a less than 4% of the surveyed households. Other sources of income are only scantly represented in the rural household economy especially as the main source of earnings. Even cooperative societies are not so strongly developed and their role as the main source of income is very meager.

With regard to urban households, the occupational status of surveyed households in all the seven zones of the Tigray region indicates that there are a good number of people engaged as private account workers and civil servants.

## 3.2. Education

Education is a key measure in development a crucial instrument in socio-economic transformation. In the current regional socio-economic baseline study household heads or their associates were asked about their literacy, educational level, factors involved for non-attendance or drop outs, distance to schools and a number of other issues. The responses are given in the subsequent tables below.

### 3.2.1: Literacy

Access to education by communities is an important measure of developmental achievements. In fact, basic literacy is a good first step to advance educational status and build capacities of entire populations in a given country. This may be achieved through formal or informal mechanisms ranging from official school attendance to adult education or training in religious institutions. Household heads were asked if they and other members of the household were able to write or/and write.[2] The results are given in table 3.2.1 below.

[2] An alternative way to measure literacy could have been to ask people whether they are able to read and write at the same time; but recognizing the fact that individuals may be able to read but still have problems with writing or vice versa; the questions were separately treated.

**Table 3.2. 1:** Population distribution by ability to read

| | Urban | | Infant town | | Pure rural | | Regional | |
|---|---|---|---|---|---|---|---|---|
| Able to read | Male | Female | Male | Female | Male | Female | Male | Female |
| No | 10.47 | 22.41 | 26.60 | 41.79 | 34.02 | 50.38 | 26.41 | 40.51 |
| Yes | 89.53 | 77.59 | 73.40 | 58.21 | 65.98 | 49.62 | 73.59 | 59.49 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

(Socio-economic baseline survey, 2018)

Table 3.2.1 above shows proportion of household members that are able to read. It is interesting to note that women are disadvantaged in terms of developing their reading skills as over 73 % of males are able to read compared to the 59.49% for females at a regional level. The causes for such discrepancies must be analyzed further in future studies in order to reveal the factors behind these figures. More inclusive programmes might help enhance the participation of more number of women in formal education in order to reverse the situation. While the bulk majority of females who live in urban areas can read (i.e. 77.59%), the figure for women in rural areas is a little less than half of the population (i.e. 49.62%).

**Table 3.2. 1:** Population distribution by ability to write

| | urban | | Infant | | Rural | | Region | |
|---|---|---|---|---|---|---|---|---|
| Able to write | Male | Female | Male | Female | Male | Female | Male | Female |
| No | 10.62 | 22.58 | 26.69 | 41.93 | 34.41 | 50.63 | 26.69 | 40.73 |
| Yes | 89.38 | 77.42 | 73.31 | 58.07 | 65.59 | 49.37 | 73.31 | 59.27 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

**(Socio-economic baseline survey, 2018)**

As indicate in the above footnote, the questionnaire was designed in such a way that ability to read and ability to write were separately treated in the assumption that there could be people who can read but are unable to write or vice versa; when the results were computed separately, it was found out that there are in fact similarities in the figures for the two variables. Therefore, as indicated in the above table the proportion of males who are able to write is much higher than that of females at a regional level (i.e. 73.31% and 59.27% respectively). It is also indicated that more number of men and women in urban areas are able to write compared to those in rural areas possibly because of better access to educational opportunities in towns. There is, however, a

need to address the gender imbalance in terms of literacy levels, which calls for gender sensitive programmes to make ensure women's equal participation in education.

### 3.2.3: Type of education

Adult literacy and religious education programmes are viewed as good platforms to increase the literacy of people in both urban and rural localities besides the modern education provided by formal schools. Both have a long history in Ethiopia in general and Tigray in particular. However, participation of people in such programmes has long been constrained by a number of factors leading to a low level of attendance especially by women. Table 3.2.3 below discusses manifestations of the access to formal and informal education by household heads.

**Table 3.2.3:** Distribution of household educational level by sex

| | Urban | | Infant towns | | Pure Rural | | Region | |
|---|---|---|---|---|---|---|---|---|
| Education level | Male | Female | Male | Female | Male | Female | Male | Female |
| Illiterate | 17.30 | 5.85 | 19.51 | 27.75 | 19.41 | 44.77 | 18.63 | 8.59 |
| Adult education | 2.31 | 0.84 | 1.57 | 3.40 | 2.71 | 0.97 | 2.40 | 0.93 |
| Religious education | 4.28 | 0.17 | 5.27 | 0.52 | 15.05 | 0.64 | 9.60 | 0.20 |
| Modern | 76.11 | 93.15 | 73.65 | 68.32 | 62.83 | 53.62 | 69.38 | 90.28 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

(Socio-economic baseline survey, 2018)

The above table (table 3.2.3) demonstrates that only small number of household heads obtained adult education certificates at a regional level (a little over 2% for males and less than 1% for females), which means the figure for females is less than half that of men.. It also looks evident from the data that male headed households have better access to religious education in rural areas; whereas modern education still dominates in all categories. Illiteracy rate for women in rural areas still remains to be high.

### 3.2.4: Factors for not attending school or dropouts

While school enrolment is an important factor in educational attainment, it is also crucial to maintain attendance and participation until higher levels of literacy are achieved. During the socio-economic baseline survey, an attempt was also made to see the main reasons for school drop outs among rural household members. The responses are given in the following table (table 3.2.4.).

**Table 3.2. 2:** Distribution of household members by reason for not attending school or dropouts

| Reason for not attending/school drop out | Urban | Infant towns | Pure rural | Regional |
|---|---|---|---|---|
| Busy with HOUSEHOLD chores | 26.46 | 42.74 | 46.35 | 49.08 |
| Unable to pay school fee | 14.54 | 15.90 | 14.92 | 14.98 |
| Sickness/disability | 4.48 | 3.08 | 2.97 | 1.77 |
| School is far | 6.27 | 19.66 | 23.26 | 15.65 |
| Education is useless | 3.58 | 3.25 | 3.93 | 2.95 |
| Don't want to be employed | 20.81 | 2.22 | 2.49 | 5.61 |
| Other | 23.85 | 13.16 | 6.08 | 9.96 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 |

(Socio-economic baseline survey, 2018)

As indicated in the above table, the result of the survey clearly reveals that majority (over 46%) of the people in rural locations said they did not attended or dropped out of school because household activities consumed much of their time preventing them from actively engaging in education. As indicated in table 3.2.4 above, there is an overall awareness that education is useful in life as only less than 4% of surveyed households attributed their school dropout or non-attendance to negative attitude towards formal education.

**3.2.5: Level of education**

During the baseline survey, an attempt was made to examine the levels of educational achievements among household members. Detailed levels of education of household levels were measured at a regional, urban, infant town and pure rural categories as this is an important feature of the socio-economic characteristics of the population in the region. The following table (table 3.2.5) depicts an aggregate picture of household members' level of education.

As demonstrated in the table, household members that made it to the level of college education at the regional level were very small in number (only less than 8.5%). This calls for more concerted efforts on inclusive educational packages in Tigray especially at the lower levels. Those who made it to colleges and universities in the rural areas are not that many (less than 4% of the sample population). It is also apparent from the above table that only negligible number of households has gone through technical education in the rural areas.

**Table 3.2. 3:** Population distribution by level of education

| Level of education | Urban | | Infant towns | | Pure rural | | Regional | |
|---|---|---|---|---|---|---|---|---|
| | Un-weighted | Weighted | Un-weighted | weighted | Un-weighted | weighted | Un-weighted | weighted |
| Illiterate | 13.30 | 12.73 | 5.99 | 5.89 | 5.19 | 5.33 | 8.44 | 8.39 |
| Elder education | 1.57 | 1.42 | 0.75 | 0.74 | 0.71 | 0.72 | 1.05 | 1.01 |
| Religious | 1.28 | 1.20 | 1.38 | 1.40 | 3.30 | 3.38 | 2.27 | 2.29 |
| Not finished primary | 19.18 | 18.26 | 36.36 | 36.60 | 42.62 | 43.25 | 32.74 | 32.80 |
| Finished primary | 7.01 | 6.91 | 9.46 | 10.00 | 10.75 | 10.85 | 9.13 | 9.26 |
| Grade seven completed | 5.01 | 4.78 | 7.75 | 7.51 | 7.37 | 7.37 | 6.50 | 6.42 |
| Eight grade completed | 7.06 | 6.99 | 7.82 | 7.76 | 7.44 | 7.36 | 7.34 | 7.32 |
| Nine grade completed | 5.49 | 5.44 | 6.66 | 6.61 | 5.83 | 5.72 | 5.81 | 5.77 |
| Tenth grade completed | 13.75 | 13.77 | 13.64 | 13.50 | 10.90 | 10.48 | 12.36 | 12.26 |
| Eleventh grade completed | 3.38 | 3.31 | 1.66 | 1.67 | 1.40 | 1.40 | 2.20 | 2.20 |
| 12th grade completed | 5.58 | 5.66 | 2.11 | 2.08 | 1.25 | 1.20 | 3.04 | 3.10 |
| TTI completed | 1.12 | 1.05 | 0.06 | 0.060 | 0.02 | 0.02 | 0.45 | 0.44 |
| Technic 1 completed | 0.96 | 0.95 | 0.65 | 0.65 | 0.48 | 0.48 | 0.69 | 0.69 |
| Technique 2 completed | 0.91 | 0.93 | 0.35 | 0.34 | 0.33 | 0.31 | 0.56 | 0.57 |
| Technique 3 completed | 0.49 | 0.52 | 0.35 | 0.36 | 0.28 | 0.27 | 0.37 | 0.38 |
| Technique 4 completed | 4.27 | 4.08 | 0.18 | 0.18 | 0.12 | 0.12 | 1.74 | 1.71 |
| Technique 5 completed | 0.92 | 0.96 | 0 | 0 | 0.19 | 0.03 | 0.45 | 0.40 |
| College diploma completed | 5.41 | 5.49 | 2.01 | 2.03 | 0.59 | 0.63 | 2.64 | 2.75 |
| College degree incomplete | 0.99 | 1.05 | 0.63 | 0.60 | 0.39 | 0.17 | 0.65 | 0.58 |
| College degree completed | 1.74 | 1.86 | 1.44 | 1.28 | 0.44 | 0.50 | 1.07 | 1.15 |
| Second degree and above completed | 0.34 | 0.26 | 0.06 | 0.06 | 0.05 | 0.02 | 0.16 | 0.12 |
| Other specify | 0.26 | 0.36 | 0.69 | 0.69 | 0.33 | 0.37 | 0.35 | 0.41 |

(Socio-economic baseline survey, 2018)

### 3.2.6. Gross school enrolment ratio

The gross enrolment ratio for elementary and secondary school was also computed to see what proportion of the school age children are currently benefiting from our educational system. According to UNICEF (ND), Gross Enrolment Ratio is defined as "The number of children enrolled in a level (primary or secondary), regardless of age, divided by the population of the age group that officially corresponds to the same level." The following table provides information on the same for the different categories.

**Table 3.2.6 :** Distribution of School children by Gross Enrolment Rate (GER)

| Category | Enrolment at primary level | Population of official primary school age | Enrolment at secondary level | Population of official secondary school age | GER at Primary school (%) | GER at Secondary school (%) |
|---|---|---|---|---|---|---|
| Urban | 3878 | 2186 | 4634 | 1701 | 177.40 | 272.42 |
| Infant town | 2305 | 1291 | 1747 | 881 | 178.54 | 198.29 |
| Pure rural | 9874 | 5588 | 5839 | 3599 | 176.70 | 162.23 |
| Regional | 16057 | 9065 | 12220 | 6181 | 177.13 | 197.70 |

(Socio-economic baseline survey, 2018)

The gross enrolment ratio for all observation is over 100 % because people outside the official age for primary and secondary levels can attend such schools inflating the total percentage. For example, the above table indicates Gross Enrolment ratio for all categories is more than 160% at both levels.

### 3.2.7. Net school enrolment ratio

The Net Enrolment Ratio is also an important element in calculating the access to education by school children. UNICEF (ND) defines it as "The number of children enrolled in primary school who belong to the age group that officially corresponds to primary schooling, divided by the total population of the same age group." The following table presents the findings for Tigray region.

**Table 3.2.7:** Distribution of school children by Net Enrolment Rate (NER)

| Category | Enrolment of official primary school age | Population of official primary school age | Enrolment of official secondary school age | Population of official secondary school age | NER at primary school (%) | NER at secondary school (%) |
|---|---|---|---|---|---|---|
| Urban | 1846 | 2186 | 1141 | 1701 | 84.44 | 67.08 |
| Infant towns | 1151 | 1291 | 531 | 881 | 89.16 | 60.27 |
| Pure rural | 4668 | 5588 | 1684 | 3599 | 83.54 | 46.79 |
| Regional | 7665 | 9065 | 3356 | 6181 | 84.56 | 54.30 |

(Socio-economic baseline survey, 2018)

As can be seen from the above table, the Net Enrolment Ratio at the regional level is 84.56% at primary school level while the figure is much lower at the secondary level. This may be due to several factors including the fact that many children drop out of school for many reasons particularly in rural areas. It is indicated in the table that the figure for rural areas is significantly lower at the secondary school level (46.79%) while there is no significant difference for rural and urban locations for primary school enrolments. This indicates that there are more dropouts as children progress to higher levels due to several factors.

### 3.2.8: Distance to primary school

In light of the massive government investments on public social service provisions in the past more than couple of decades, it is mandatory to assess issues of educational access in urban and rural areas of the region. The following table (Table 3.2.7.) shows the distance people have to travel to reach nearest school.

**Table 3.2. 8:** Distribution of responses on distance to nearest primary school

| Distance to primary school (in Km) | Urban | Infant towns | Pure rural | Regional |
|---|---|---|---|---|
| <3 Kilometers | 99.83 | 99.18 | 95.97 | 97.96 |
| 3-6 Kilometers | -- | -- | -- | -- |
| 6.1-9 Kilometers | 0.11 | 0.48 | 1.96 | 1.01 |
| 9.1-12 Kilometers | 0.03 | 0.34 | 1.36 | 0.69 |
| >12 Kilometers | 0.03 | -- | 0.72 | 0.34 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 |

(Socio-economic baseline survey, 2018)

As indicated in the above table, at a regional level, 97.96% of the respondents stated that the distance to their nearest primary schools is less than 3 Kilometers. The urban figures also clearly indicate that elementary schools are within an easy reach. Only an insignificant proportion of the households (i.e. less than 2%) claim they travel more than 6 kilometers to reach the nearest primary school. Even in rural areas, over 95% of the respondents stated their elementary schools are on average located within 3 kilometers radius. This is indicative of an overall improvement in educational coverage and access to primary schools in Tigray. Results of the Focus Group Discussions and Key informant Interviews in the sample woredas also support these arguments.

### 3.2.9. Distance to secondary school

Following successful completion of primary school education, high-school education brings more academic opportunities as well as difficulties for learners and prepares young boys and girls for yet another challenge at the tertiary level. During the socioeconomic baseline survey households were asked to give an account of how far the secondary schools were located in their respective areas of residence; and their responses are presented in the following table.

**Table 3.2. 9:** Distribution of responses on distance to nearest secondary school

| Distance to Secondary School (in Km) | Urban | Infant towns | Pure rural | Regional |
|---|---|---|---|---|
| <3 Kilometers | 99.27 | 75.09 | 23.94 | 59.81 |
| 3-6 Kilometers | 0.20 | -- | -- | 0.08 |
| 6.1-9 Kilometers | 0.03 | 5.31 | 14.49 | 7.68 |
| 9.1-12 Kilometers | -- | 8.22 | 25.47 | 13.35 |
| >12 Kilometers | 0.51 | 11.39 | 36.10 | 19.08 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 |

(Socio-economic baseline survey, 2018)

As has been amply demonstrated in the above table, at a regional level, nearly 60% of the respondents asserted secondary schools are located within a distance of 3 kilometers. There is a skewed distribution of responses between urban locations as the discrepancy between the two is wide. More than 99% of urban dwellers said they have to travel a total distance of less than three kilometers while only 23% of rural residents said the same.

### Major challenges in education

Following is a description of the result of the qualitative survey on educational quality that was obtained through FGDs and Key informant interviews:

In the national GTP2 document for the years 2016-2020, it is clearly stated that more efforts would be geared towards improving the quality of education through a number of stringent measures and interventions including in the area of educational governance, teachers' capacity building, and ICT expansion. (GTP2: 2015). In line with that, results of the focus group discussions and key informant interviews also revealed that there has been massive work in terms of improving educational access both in the urban and rural areas including infant towns. In the urban areas, private investments have also contributed to such a significant improvement in the last two and half decades. Investments in schools by individual entrepreneurs are limited to institutions of learning that extend to colleges and universities in major town while this is limited to the building of a handful of kindergartens in the infant towns. In rural areas, private institutions are entirely non-existent.

There are conditions in the surveyed rural areas in which young boys and girls at the primary school level have to travel long distances to reach the schools. By the time they reach school they lose all their energy, get exhausted and feel sleepy and hence cannot take up their lessons attentively. In effect, the team of researchers was told that parents now decide to keep their school age children at home until the age of 10 as they have to be strong enough to bear the challenges of having to travel long distances to get to school. These delays of onset of formal schooling by over 4 years have had its own repercussions on career planning and the child's psychological makeup.

Informants from practically all sample rural, urban and semi-urban sites/woredas voiced their biggest concern regarding the decline of the quality of education that accompanied expansion of educational establishments. Several developments and factors that contributed to them were mentioned: among the most prominent factors cited were;

1) The lack of appropriate capacity of teachers to handle courses that is pertinent to their educational qualification (degrees/diplomas obtained). FGD participants and key informants indicated that many teachers/particularly new recruits lack the confidence to teach subject matters in which they were trained to a point where some even refuse to handle such courses (e.g. English). In addition, teachers are asked to teach areas of knowledge in which for which they are not qualified. More courses assigned to them naturally meant there is a lack of focus as the teachers need to prepare for all the courses they at the same time often at the expense of intensity of mastery in one.

2) Another factor often mentioned by informant from the community and sector offices is the lack of motivation of teachers to diligently deliver knowledge. The teaching profession earns much less respect nowadays than other professions partly because of the relatively lower wage schedule and poor working conditions particularly in remote rural areas. The team of researchers was informed about the increased inclination of teachers to enroll in side degree programs through distance learning (especially in the field of business and economics) with the aim of moving to other white collar jobs after graduation. Once they earn degrees in accounting, for example, they can easily switch to the banking sector which pays more and at the same time relocate to the urban areas.
3) There is also lack of close follow-up and monitoring of the day to day academic progress of students by teachers as well as parents. This was seen as direct result of the zero-attrition policy pursued in public academic institutions. Teachers' performances have been evaluated based on the success rate of students measured in terms of whether they promote to successive grade levels or not.

4. In addition, the quality of public schools constructed particularly in rural areas remains to be low. Informants complained about disintegrating schools; schools without fences, as well as old and outdated facilities. Chairs and tables are either missing or torn apart due to overuse and low replacement rates; books and laboratory facilities are inaccessible or only meagerly supplied. In some areas, schools are inappropriately situated.

**3.2.10: Distance to nearest mill**

Milling services are important not only because they are directly linked to immediate food consumption and hence address questions of survival; but also because easy access to them affects time management especially by women. The following table discusses distance to nearest mills in urban, rural and infant towns as well as regional levels.

**Table 3.2.10:** Distribution of responses on distance to the nearest mill (in kilometers)

| Distance in Kilometers | Regional | Urban | Infant towns | Rural |
|---|---|---|---|---|
| < 3 km | 75.27 | 93.65 | 99.5 | 92.66 |
| 3-6 km | 14.14 | 5.58 | -- | -- |
| 6.1-9 km | 5.27 | 1.74 | 0.36 | 2.28 |
| 9.1-12 km | 4.96 | 0.001 | 0.12 | 2.08 |
| >12 km | 4.71 | - | -- | 2.98 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 |

(Socio-economic baseline survey, 2018)

At a regional level over 75% of the households claimed they travel for less than half an hour (3kms) to reach the nearest mill while only less than 5% said that such mills are far and need over two hours to reach them.

As far as urban households are concerned, the findings were much similar to the ones for schools. In fact, as indicated in the above table, over 93.6% of the respondents claimed that they only need to travel less than 3Kms to get access to the nearest mill. Those who said they have to travel over 9kms i.e. for an hour and a half or more are negligible (0.001).

Among rural households also, there is strong evidence from the current study that a lot of investments have been made to provide rural communities with milling services as nearly 92% of the respondents asserted that mills are within half an hour's distance from their homes. However it is also to be noted that nearly 3% do travel much longer distances to places that takes more than two hours of walking.

**3.2.11: Distance to nearest Banks or MFI**

Distance to banks and microfinance institutions was assessed in urban locations because access to financial institution stimulates economic activities such as investments and saving at household levels; the following table (table 3.2.8) shows the current status in terms of the access to such institutions.

**Table 3.2. 11:** Distribution of responses on distance to the nearest banks or MFI (Urban)

| Distance in kilometers | Number of households | % |
|---|---|---|
| < 3 km | 3, 860 | 94.10 |
| 3-6 km | 229 | 5.58 |
| 6.1-9 km | 9 | 0.22 |
| 9.1-12 km | 1 | 0.02 |
| >12 km | 3 | 0.07 |
| Total | 4102 | 100.00 |

(Socio-economic baseline survey, 2018)

As indicated in the above, majority of the sample urban households (over 94%) indicated that they do not travel long distance to reach their nearest bank or microfinance institution to get access to financial services. The time required to reach such destinations is limited to less than half an hour at most. It has been said time and again that communities' access to basic services such as those provided by financial institutions have dramatically improved over the past couple of decades. Banks and microfinance institutions have flourished all overt Tigray creating a

conducive environment for effective financial and economic transactions. As amply demonstrated above, data obtained from the current socio-economic baseline survey supports such claims.

### 3.2.12. Migration

Migration is becoming an important factor in the discourses on development globally. Tigray is one of the most migration-prone regions in Ethiopia; hence it is imperative that the status of migration is studied and documented at different times to track changes in the magnitude of the problem and pinpoint the demographic profiles of migrants. In the current socio-economic baseline study, an initial attempt was made to have an overview of the sex distribution of those with migration experiences, the causes and main destinations. The figures are briefly presented in the three tables below (table 3.2.9, 3.2.10. 3.2.11)

**Table 3.2. 12:** Distribution of migrants by sex

| Sex | urban | infant town | pure rural | regional |
|---|---|---|---|---|
| Male | 53.94 | 59.59 | 56.24 | 55.80 |
| Female | 46.06 | 40.41 | 43.76 | 44.20 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 |

(Socio-economic baseline survey, 2018)

Table 3.2.12 above clearly demonstrates that migration is very much present in Tigray and the percentage of male migrants is higher than that of females at all levels. Most migrants (55.8%) were found out to be males although the figure for women migrants is also on the rise. This is probably true in light of the fact that men tend to take more risk trying other means of livelihood than women do.

### 3.2.13 Migration Destination

In the literature, it is often mentioned that there often two routes of migration from Tigray region. The low profile uneducated youth prefer to go to the Gulf States to engage in low profile domestic work; whereas those who are better informed, economically and intellectually well to do migrate to Europe through some of the failed states in northern Africa including Libya. During the socio-economic baseline survey, attempts were made to identify the destination of migration by household members. The results are presented in the table below.

**Table 3.2. 13:** Distribution of households by place of migration

| Place of migration | Urban | Infant towns | Pure rural | Regional |
|---|---|---|---|---|
| Inside the region | 24.05 | 37.85 | 52.92 | 43.45 |
| Outside the region | 36.15 | 26.07 | 21.80 | 26.04 |
| Outside the country | 39.80 | 36.09 | 25.28 | 30.50 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 |

(Socio-economic baseline survey, 2018)

The above table (table 3.2.13) shows primary migration within the region is often the first step before thinking to migrate overseas; this is demonstrated by the fact that more than half (52.92%) of the rural migrants were destined to areas within the region. For urban dwellers, migrants prefer to go overseas or anywhere outside the country or other parts of the country.(i.e. 39.8 and 36.15% respectively)

Therefore, overall, most urban migrants tend to migrate outside the country or outside the region. They would like to take a long distance route because there is a general conviction among young migrants and potential migrants that better opportunities can be harnessed with international migration. Otherwise, people can travel to bigger cities and other places with high economic potential inside the country for better livelihood opportunities.

### 3.2.14. Reasons for Migration

There are several reasons as to why migrants leave their own place of origin. In the literature, the dynamics have been discussed under push and pull factors although this masks other crucial socio-cultural factors that are equally important. Table 3.2.13 below summarizes the major factors for the temporary or semi-permanent relocation of the youth to another destination

**Table 3.2. 14:** Distribution of households by reason for migration

| Reason for migrating | Urban | Infant town | Pure rural | Regional |
|---|---|---|---|---|
| Unable to find work | 39.40 | 61.13 | 60.92 | 53.56 |
| Better life | 39.26 | 28.62 | 30.70 | 33.35 |
| Forced by parents/friends | 1.85 | 0.71 | 1.70 | 1.61 |
| Wrong information | 0.57 | 1.77 | 0.19 | 0.54 |
| To pay debt | 0.28 | --- | 0.09 | 0.15 |
| Other | 18.63 | 7.77 | 6.40 | 10.79 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 |

(Socio-economic baseline survey, 2018)

The above table clearly demonstrates the fact that most migrants move out because of unemployment. At a regional level, over half of them (53.56%) migrate because they were unable to find jobs in their own localities. As urban centers provide better opportunities for wok the figure for them is lower (only 39.4%) compared to that of infant towns and pure rural areas (i.e. about 61% for each category).

Another prominent factor for migration from urban and rural areas is concerned with pull factors in destination areas. As can be seen from the above table, over 33% of the migrants said they were gravitated by better life at the receiving end. Therefore, less access to work and longing for a better life particularly abroad were mentioned as the main reasons for their migration. Only less than 14% have attributed their outward movement to other destinations to lack of or wrong information were small in number.

## 3.3. Agriculture

### 3.3.1. Crop Production:

Agriculture in Ethiopia is the backbone of the national economy, and the source of foreign currency earning and raw materials for the local agro-industries. It contributes 42.5% of the national gross domestic product (CSA, 2008), and 90% of export earnings (Assefa, 2005). About 80% of the population is also engaged in this sector. The share of crop production in agriculture is estimated at 68.4% (CSA, 2008).

#### *3.3.1.1 Engagement of the population in the farm activity*

Farming is among the activities in which people are engaged to lead their life. Region wise, 53.5 % of the householders were generally engaged in the farming activity (Table 3.3. 1:). Among the total householders engaged in the farming activity, 27% were females.

In the urban, 11.6% of the households were involved in the farming activities either as a side or main business. This shows that the number of householders involved in farming activity in the urban is very low indicating the availability of alternative businesses to engage the people. Among the total householders who were involved in farming, 38% were females.

In the infant towns, 51.5% of the sampled householders were engaged in farming activity, among which 29% of the total house holders were females. In the rural, 80.9% of the total householders were engaged in farming out of which 25% were females.

### *3.3.1.2. Average farmland holding capacity*

The regional average land holding used for crop production is 0.6 ha (Table 3.3. 2). The majority of the householders (78%) own smaller land size (0.01-1.0 ha). About 16% of the householders had 1.0-2.0 ha of farmland size.

In the urban, farm land size between 0.01 - 0.255 ha was owned by 48% of the householders (Table 3.3. 2). About 20% of the householders also owned 0.26-0.5 ha whereas 14.3% of the householders owned 0.5-1.0 ha. In the rural, the largest share of the householders (56%) owned land size of 0.25 to 1.0 ha. About 23% of the householders which were interviewed also owned very smaller land size (below 0.25 ha). The percentage of householders with 1-2 ha was 17% while owning more land size was responded by few householders.

The land holding size in the infant towns followed similar trend as it was observed in the rural areas.

**Table 3.3. 1:** Number of HOUSEHOLD responded for their engagement in farm activities

| No. | Response | Response of HOUSEHOLD (in %) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Region | | Urban | | Infant Towns | | Rural | |
| | | Male (N=8174) | Female (N=4122 | Male (N=2355) | Female (N=1799) | Male (N=1065) | Female (N=622) | Male (N=4754) | Female (N=1701) |
| 1 | Yes | 59.1 | 42.4 | 12.8 | 10.1 | 57.9 | 40.5 | 82.2 | 77.4 |
| 2 | No | 40.9 | 57.6 | 87.2 | 89.9 | 42.1 | 59.5 | 17.8 | 22.6 |
| | Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

**Table 3.3. 2:** Farmland size owned by householders

| No | Size of farmland (ha) | Response of HOUSEHOLD (in %) | | | |
|---|---|---|---|---|---|
| | | Region (N=6521 | Urban (N=477) | Infant Towns (N=860) | Rural (N=5184) |
| 1 | 0-0.255 | 24.4 | 47.8 | 18.5 | 23.3 |
| 2 | 0.255-0.504 | 26.1 | 20.3 | 22.8 | 27.1 |
| 3 | 0.505-1.004 | 27.2 | 14.3 | 25.5 | 28.6 |
| 4 | 1.005-2.004 | 16.0 | 6.1 | 18.6 | 16.5 |
| 5 | 2.005-4.004 | 4.0 | 3.8 | 9.3 | 3.2 |
| 6 | 4.005-6.004 | 1.0 | 4.0 | 2.7 | 0.5 |
| 7 | 6.005-10.004 | 0.3 | 1.3 | 0.6 | 0.2 |
| 8 | >10.005 | 0.9 | 2.5 | 2.1 | 0.6 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |

### *3.3.1.3. Land ownership (type and since when it was owned)*

Sixty nine percent of the householders in the urban owned their farmland through distribution by the local administration, whereas 14.3% of the householders owned farmland through inheritance from their ancestors (Table 3.3. 3). The farmland owned by lease is only 0.4%. The farmland used for crop production through renting and sharing in was 8.9% and 6.2%, respectively.

With regard to zones, 54-75% of the householders responded for owning of farmland through land distribution (Table 3.3. 3). Inheritance of the farm land was the second means of owning land in all the zones except in Western and North Western zones where, 17-22% of the householders responded for using farmlands by renting agreement. In Mekelle zone as well, 11.4% of the respondents cultivated farmlands by renting the land.

**Table 3.3. 3:** Number of households that responded for the farmland ownership in the urban

| Zones | Response for the land ownership | | | | | | |
|---|---|---|---|---|---|---|---|
| | Rent | Lease | Inheritance | Share in | Distribution | Others | Total (N) |
| Southern | 3.9 | 0.0 | 19.1 | 5.6 | 71.3 | 0.0 | 178 |
| Mekelle | 11.4 | 2.3 | 15.9 | 11.4 | 54.5 | 4.5 | 44 |
| Eastern | 3.0 | 0.0 | 12.1 | 6.1 | 72.7 | 6.1 | 33 |
| Central | 5.8 | 1.0 | 12.6 | 4.9 | 74.8 | 1.0 | 103 |
| Western | 17.2 | 0.0 | 12.5 | 3.1 | 64.1 | 3.1 | 64 |
| North Western | 21.7 | 0.0 | 5.0 | 10.0 | 61.7 | 1.7 | 60 |
| Total (N) | 43 | 2 | 69 | 30 | 330 | 8 | 482 |
| (%) | 8.9 | 0.4 | 14.3 | 6.2 | 68.5 | 1.7 | |

Table 3.3.4 shows the response of householders since when they owned their farmlands. According to their response, about 49% of the householders owned their farmland in 1988-1997, whereas 23% of the householders responded that the ownership was since 1938-1987, and 28% of the respondent said it was owned in 1998-2017.

The timing in the ownership of the farmlands in the urban, infant towns and rural areas is similar as was indicated for the region.

**Table 3.3. 4:** Response of householders for the start of farmland ownership

| No | Period | Response of HOUSEHOLD (in %) | | | |
|---|---|---|---|---|---|
| | | Region (N=6520) | Urban (N=472) | Infant Towns (N=860) | Rural (N=5188) |
| 1 | 1938-1987 | 22.6 | 18.4 | 18.3 | 23.7 |
| 2 | 1988-1997 | 48.7 | 48.7 | 45.3 | 49.3 |
| 3 | 1998-2007 | 14.5 | 15.5 | 18.7 | 13.7 |
| 4 | 2007-2017 | 14.2 | 17.4 | 17.7 | 13.3 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |

In the urban, crops are produced in own account farms, in back yards or on commercial bases (Table 3.3. 5:). Most (86%) of the householders in the urban cultivate on own account farming bases, while 6% of the householders grow crops on the backyards. The response of householders who responded for growing crops on commercial basis shared only 3.3%.

With regard to zones, 15-18% of the householders in Mekelle and Eastern zones grow crops in the back yards (Table 3.3. 5:). On the other hand, 3-7% of the householders in Southern, Central, Western and North Western Zones use backyards for crop production. Commercial farming is generally less utilized in the urban. Quite a few percent (4-5%) of the householders in Southern, Mekelle, Western and North Western grow crops on commercial bases. Only one percent of the householder in Central zone produced crop commercially while in Eastern zone none of the householders responded for commercial crop farming.

**Table 3.3. 5:** Number of householders by type of farming

| Zones | Response of HOUSEHOLD (%) for type of farms they owned | | | | |
|---|---|---|---|---|---|
| | Backyard | Commercial farms | Own account farming | Others | Total (N) |
| Southern | 2.8 | 4.0 | 90.4 | 2.8 | 177 |
| Mekelle | 18.2 | 4.5 | 75.0 | 2.3 | 44 |
| Eastern | 15.2 | 0.0 | 81.8 | 3.0 | 33 |
| Central | 2.9 | 1.0 | 92.3 | 3.8 | 104 |
| Western | 4.7 | 4.7 | 79.7 | 10.9 | 64 |
| North Western | 6.7 | 5.0 | 81.7 | 6.7 | 60 |
| Total (N) | 28 | 16 | 416 | 22 | |
| % | 5.8 | 3.3 | 86.3 | 4.6 | |

Table 3.3.6 shows the number of householders who responded for closeness of the farmlands to their residences. About 32 % of the householders living in the urban responded that their farmlands were closer to residences. Among these respondents 35% were females.

With regard to zones, 40-46% of the householders in Eastern and Mekelle zones responded their farmland was closer to residences, but only 27-34% of the householders in the remaining zones responded that the farmlands were near to their residences (Table 3.3. 6:). The percentages of female householders who responded for closeness of their farms to residences were 53-56% in Eastern and Sothern zones, 35% in North Western zone, 24-29% in Mekelle and Western zones, and 16% in Central zone.

**Table 3.3. 6:** Number of householders who responded for closeness of farmland to residences

| Zones | Response of HOUSEHOLD | | | |
|---|---|---|---|---|
| | Yes | | No | |
| | Male | Female | Male | Female |
| Southern | 24 | 30 | 66 | 55 |
| Mekelle | 13 | 4 | 19 | 7 |
| Eastern | 7 | 8 | 14 | 4 |
| Central | 27 | 5 | 47 | 25 |
| Western | 12 | 5 | 30 | 17 |
| North Western | 13 | 7 | 24 | 15 |
| Total | 96 | 59 | 200 | 123 |

Farmers in the region rent-in land for growing crops. The reasons why they rent-in land could be because of shortage of land that they owned, to increase profitability by cultivating more land, to help the owner of the farm etc. About 42.5 % of the householders in the Tigray region rent-in land because of the shortage of land they owned to satisfy their demands, while 31% of the respondents said closeness of the farm attracted them to rent-in land for crop production (Table 3.3. 7:). About 12.5 % of the householders rent-in land in order to increase their profitability by cultivating more land. Trends are the same for the urban and rural areas except minor changes in figures.

**Table 3.3. 7:** Response of households on reason for renting-in land

| No. | Reason | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=1594) | Infant Towns (N=255) | Rural (N=255) |
| 1 | Farm is close to residence | 31.4 | 25.1 | 32.6 |
| 2 | Shortage of land | 42.5 | 47.5 | 41.5 |
| 3 | Farm is fertile | 4.1 | 4.3 | 4.1 |
| 4 | Farm can be irrigated | 0.3 | 0.0 | 0.3 |
| 5 | Farm is accessible to transport/market | 0.2 | 0.8 | 0.1 |
| 6 | Increased profitability by cultivating more land | 12.5 | 13.3 | 12.3 |
| 7 | Have extra labour | 0.7 | 0.8 | 0.7 |
| 8 | Have extra seeds/oxen | 0.5 | 0.8 | 0.4 |
| 9 | Shortage of land to satisfy own demand | 6.1 | 5.5 | 6.3 |
| 10 | To help owner of the land | 0.4 | 1.2 | 0.3 |
| 11 | Others | 1.3 | 0.8 | 1.3 |
| | Total | 100.0 | 100.0 | 100.0 |

When the sampled householders were asked for the size of the farmland they rented-in, 52% of the household at regional level, 67% of the household in infant towns and 48% of the household in the rural rented in 2-4 ha (Table 3.3. 8:). About 29% of the householders living in the rural areas also rented-in land size ranging between 0.25-1.0.

**Table 3.3. 8:** Distribution of size of land the households rented-in in 2017/18

| No. | Land size (ha) | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=3128) | Infant Towns (N=693) | Rural (N=2435) |
| 1 | <0.255 | 11.6 | 4.8 | 13.5 |
| 2 | 0.256-0.505 | 14.1 | 9.4 | 15.4 |
| 3 | 0.506-1.005 | 13.3 | 9.4 | 14.4 |
| 4 | 1.006-2.005 | 8.2 | 7.6 | 8.4 |
| 5 | 2.006-4.005 | 52.2 | 67.1 | 48.0 |
| 6 | 4.005-6.005 | 0.3 | 0.7 | 0.2 |
| 7 | 6.006-10.005 | 0.1 | 0.4 | 0.0 |
| 8 | >10.005 | 0.1 | 0.6 | 0.0 |
| | Total | 100.0 | 100.0 | 100.0 |

Farmlands of different householders are rented-out because of various reasons. Table 3.3.9 shows the land size shared out by gender in 2017/18. The majority of householders (36% in the region; 29.3% in infant towns and 38% in rural areas) rent-out farm land size below 0.25 ha. Among the total household's who rented-out farmlands in this land size category, 20-25% was female while 9-13% was male headed household's. Farmland size ranging between 0.25-0.5 ha

was also rented out by about 28% HOUSEHOLD in infant towns and rural areas where the percent share of females was higher than the male headed households.

When asked for the reasons why farmers rented-out farmlands, shortage of ox, farness of farm lands, shortage of labour force, and unavailability of inputs were mentioned in order of importance (Table 3.3. 10). In the rural areas, 40% of the total household's responded to shortage of ox as a reason for renting out land, out of which 30% were the female household. Another 30% of the total household's in the rural areas mentioned remoteness of the farm which forced to rented-out their farm. In contrary to shortage of ox, the percentage of female headed household's who responded to remoteness of farmland as a reason to rent-out land was higher than the male headed household's.

With regard to the amount of money received from renting-out farm land, 63% of the household in the rural area and 54% in the infant towns responded that they received 1001-5000 Birr (Table 3.3. 11). About 15% of the household in rural and 20% in infant towns also received an amount ranging between 501-1000 Birr.

Table 3.3.12 shows the response of household on how newly married members got land. The majority of the members (22-26%) got land by sharing the household's land, while 13-20% of the household mentioned that married couples got land from the local peasant's administration.

**Table 3.3. 9:** Distribution of size of land the households rented-out in 2017/18

| No. | Land size | Response of HOUSEHOLD in % | | | | | |
|---|---|---|---|---|---|---|---|
| | | Region | | Infant towns | | Rural | |
| | | Male (N=406) | Female (N=555) | Male (N=85) | Female (N=106) | Male (N=321) | Female (N=449) |
| 1 | <0.255 | 12.5 | 23.9 | 8.9 | 20.4 | 13.4 | 24.8 |
| 2 | 0.256-0.505 | 11.4 | 16.9 | 11.5 | 16.8 | 11.4 | 16.9 |
| 3 | 0.506-1.005 | 12.2 | 11.9 | 14.7 | 12.0 | 11.6 | 11.8 |
| 4 | 1.006-2.005 | 5.2 | 4.8 | 9.4 | 5.8 | 4.2 | 4.5 |
| 5 | 2.006-4.005 | 0.9 | 0.3 | 0.0 | 0.5 | 1.2 | 0.3 |
| 6 | 4.005-6.005 | | | | | | |
| 7 | 6.006-10.005 | | | | | | |
| 8 | >10.005 | | | | | | |
| | Total | 42.2 | 57.8 | 44.5 | 55.5 | 41.7 | 58.3 |
| | Grand Total | 100.0 | | 100.0 | | 100.0 | |

**Table 3.3. 10:** Response of households on reason for renting-out land

| No. | Reason | Response of HOUSEHOLD in % | | | | | |
|---|---|---|---|---|---|---|---|
| | | Region | | Infant towns | | Rural | |
| | | Male (N=415) | Female (N=562) | Male (N=86) | Female (N=108) | Male (N=329) | Female (N=454) |
| 1 | Farm is far | 19.3 | 14.5 | 24.2 | 25.3 | 18.1 | 11.9 |
| 2 | Low soil fertility | 1.1 | 0.7 | 0.0 | 1.0 | 1.4 | 0.6 |
| 3 | Farming is not profitable | 0.3 | 0.4 | 0.0 | 0.5 | 0.4 | 0.4 |
| 4 | In availability of inputs | 1.5 | 4.6 | 1.0 | 1.5 | 1.7 | 5.4 |
| 5 | Shortage of ox | 9.1 | 27.7 | 6.2 | 19.1 | 9.8 | 29.9 |
| 6 | Shortage of money | 1.4 | 2.0 | 3.1 | 3.1 | 1.0 | 1.8 |
| 7 | Shortage labour force | 4.7 | 5.6 | 4.6 | 4.1 | 4.7 | 6.0 |
| 8 | Others | 4.9 | 1.8 | 5.2 | 1.0 | 4.9 | 2.0 |
| | Total | 42.5 | 57.5 | 44.3 | 55.7 | 42.0 | 58.0 |
| | Grand Total | 100.0 | | 100.0 | | 100.0 | |

**Table 3.3. 11:** Distribution of amount of rent (money) obtained by households who have rented-out land

| No. | Amount (Birr) | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=778) | Infant Towns (N=142) | Rural (N=636) |
| 1 | <100 | 0.1 | 0.7 | 0.0 |
| 2 | 101-500 | 10.5 | 9.2 | 10.8 |
| 3 | 501-1000 | 15.7 | 20.4 | 14.6 |
| 4 | 1001-5000 | 61.7 | 54.2 | 63.4 |
| 5 | 5001-10000 | 9.6 | 10.6 | 9.4 |
| 6 | >10001 | 2.3 | 4.9 | 1.7 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 12:** Response of households on how married members get land

| No. | Means of getting land | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=967) | Infant Towns (N=193) | Rural (N=774) |
| 1 | Share the household land | 24.8 | 22.3 | 25.5 |
| 2 | The PA does provide | 14.8 | 20.2 | 13.4 |
| 3 | Inheritance | 10.2 | 6.2 | 11.2 |
| 4 | Others | 3.8 | 7.3 | 3.0 |
| 5 | 1 & 2 | 8.3 | 8.3 | 8.3 |
| 6 | 1 & 3 | 13.0 | 13.0 | 13.0 |
| 7 | 2 & 3 | 7.8 | 7.8 | 7.8 |
| 8 | 1, 2 & 3 | 17.3 | 15.0 | 17.8 |
| | Total | 100.0 | 100.0 | 100.0 |

### 3.3.1.4. Consolidation of farmland

Farmlands owned by the farming community can be consolidated or fragmented and it can be located at shortest distance from residences or can be located at far distances. The nature of the farmlands and its location had effects mainly on the efficiency of the farmers.

Table 3.3.13 shows the percentages of the household who responded on the consolidation of the farmland. Among the household who were asked in the rural and infant towns, 50-58% responded that their farm land were consolidated while the remaining household said their farmlands were fragmented. The reasons for having fragmented lands in infant towns and rural were: shortage of lands (responded by 23% of the HOUSEHOLD), land tenure system (22-25% of the household), and by both (16-21% of the household) (Table 3.3. 14:).

When asked if the fragmented farmland had any problem, 63% of the household in the rural responded yes but in infant towns 43% of the household said yes (Table 3.3. 15:). With land fragmentation, farness and smaller size of the farmlands are few of the problems mentioned (Table 3.3. 16:). Distant location of the farmlands is responded by 64-68% of the household in the rural and infant towns. Even though fragmented farmland had problems, they could also have their advantages (Table 3.3.17:). About 40-49% of the household said that variety of soil fertility could be among the benefits with land fragmentation, while 12-16% of the household also mentioned fairness of land distribution could also be another cause and effect of the land fragmentation. In line with, distance between two nearest and distant crop fields are indicated in Table 3.3.18.

**Table 3.3. 13:** Response of households on consolidation of land holding

| No. | Response | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=6553) | Infant Towns (N=951) | Rural (N=5602) |
| 1 | Consolidated | 57.1 | 49.6 | 58.4 |
| 2 | Fragmented | 42.9 | 50.4 | 41.6 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 14:** Response of households on reason for having fragmented farmlands

| No. | Reason | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=3746) | Infant Towns (N=471) | Rural (N=3275) |
| 1 | Shortage of land | 22.7 | 22.9 | 22.7 |
| 2 | Land tenure system | 22.6 | 25.1 | 22.3 |
| 3 | Variation in soil fertility | 11.3 | 12.7 | 11.1 |
| 4 | Others | 1.4 | 2.1 | 1.3 |
| 5 | 1 & 2 | 20.4 | 15.7 | 21.1 |
| 6 | 1 & 3 | 13.3 | 14.9 | 13.0 |
| 7 | 2 & 3 | 4.5 | 3.2 | 4.7 |
| 8 | 1, 2 & 3 | 3.7 | 3.4 | 3.7 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 15:** Response on households on whether fragmentation has problem on land holding

| No. | Response | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=4972) | Infant Towns (N=846) | Rural (N=4126) |
| 1 | Yes | 59.8 | 43.4 | 63.2 |
| 2 | No | 40.2 | 56.6 | 36.8 |
| | Total | 100 | 100 | 100 |

**Table 3.3. 16:** Response of households on problems of land fragmentation

| No. | Problem | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=2944) | Infant Towns (N=363) | Rural (N=2581) |
| 1 | Plots are far apart to look after | 64.9 | 68.0 | 64.5 |
| 2 | Plots are small | 1.3 | 0.6 | 1.4 |
| 3 | Others | 0.3 | 0.3 | 0.3 |
| 4 | 1 & 2 | 33.4 | 31.1 | 33.7 |
| | Total | 100 | 100.0 | 100 |

**Table 3.3.17:** Response of households on advantages of land fragmentation

| No. | Advantage | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=780) | Infant Towns (N=105) | Rural (N=675) |
| 1 | Variety of soil fertility | 41.5 | 48.6 | 40.4 |
| 2 | Not to be affected by natural/ man-made disaster | 3.3 | 1.0 | 3.7 |
| 3 | Fairness of land distribution | 12.6 | 16.2 | 12.0 |
| 4 | Others | 6.5 | 5.7 | 6.7 |
| 5 | 1 &2 | 7.3 | 5.7 | 7.6 |
| 6 | 1 & 3 | 17.4 | 16.2 | 17.6 |
| 7 | 2 & 3 | 1.7 | 1.9 | 1.6 |
| 8 | 1, 2 & 3 | 9.6 | 4.8 | 10.4 |
| | Total | 100 | 100 | 100 |

**Table 3.3. 18:** Distance between two most distant plots and two nearest plots in hrs

| No. | Time (hrs) | Response of HOUSEHOLD in % | | | | | |
|---|---|---|---|---|---|---|---|
| | | Longest distance | | | Shortest distance | | |
| | | Region (N=4773) | Infant Towns (N=616) | Rural (N=4157) | Region (N=4691) | Infant Towns (N=601) | Rural (N=4090) |
| 1 | <0.5 | 63.2 | 57.5 | 64.1 | 85.1 | 77.2 | 86.3 |
| 2 | 0.5-0.99 | 7.9 | 8.3 | 7.8 | 2.9 | 2.7 | 2.9 |
| 3 | 1.0-1.99 | 19.9 | 21.9 | 19.6 | 8.5 | 12.6 | 7.8 |
| 4 | 2.0-2.99 | 5.7 | 7.1 | 5.5 | 2.2 | 5.0 | 1.8 |
| 5 | 3.0-3.99 | 1.8 | 2.3 | 1.8 | 0.5 | 0.3 | 0.5 |
| 6 | 4.0-4.99 | 0.7 | 1.3 | 0.6 | 0.4 | 1.2 | 0.3 |
| 7 | 5.0-5.99 | 0.2 | 0.3 | 0.2 | 0.1 | 0.2 | 0.0 |
| 8 | 6.0 or more | 0.5 | 1.3 | 0.4 | 0.3 | 0.8 | 0.2 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

### *3.3.1.5. Annual and perennial crops production*

#### 3.3.1.5.1. Annual Crops

Cereals, pulses, oil crops, and various vegetable and fruit crops are cultivated in the Tigray region. Among the cereal crops, tef, barley wheat, sorghum are dominant. Sesame is a major oil crop cultivated in Western, North Western and Central zones of Tigray. Among the legume crops, lentil, and faba bean were grown in different parts of the region.

### i. Land size

About 31% of the household in the region hold farmland ranging between 0.25 and 0.5 ha (Table 3.3. 19:). About 27% of the household each own land sizing <0.25 ha and 0.5-1.0 ha. Only few percentages (12%) of the household had land size of 1.0-2.0 ha.

**Table 3.3. 19:** Distribution of cultivated land (in ha)

| No. | Range of cultivated land (ha) | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=5677) | Infant Towns (N=781) | Rural (N=4896) |
| 1 | <0.255 | 27.1 | 32.4 | 26.2 |
| 2 | 0.256-0.505 | 31.4 | 32.1 | 31.3 |
| 3 | 0.506-1.005 | 27.5 | 22.9 | 28.3 |
| 4 | 1.006-2.005 | 11.7 | 10.5 | 11.9 |
| 5 | 2.006-4.005 | 2.0 | 1.9 | 2.0 |
| 6 | 4.005-6.005 | 0.1 | 0.1 | 0.1 |
| 7 | 6.006-10.005 | 0.1 | 0.0 | 0.1 |
| 8 | >10.005 | 0.2 | 0.0 | 0.2 |
| | Total | 100.0 | 100.0 | 100.0 |

HOUSEHOLD with no land are excluded

### ii. Crop productivity

Table 3.3.20 shows productivity of the various crops cultivated in the Tigray region. Cereals are the main crops grown in the region. According to the householder respondents, maize and sorghum were productive crops which yielded 15 and 18 qt/ha, respectively. The productivity of wheat and barley was 14 and 12 qt/ha, respectively. Tef and finger millet yielded 11 and 8 qt/ha, respectively.

Within the oil crops, sesame and linseed are two items captured in the survey. The productivity of sesame was 8 qt/ha whereas linseed yielded 3 qt/ha. Oil crops are grown for export market, for local oil production, to flavour the food consumed at home, and for cash earning of the householders in the region. Among the oil crops, sesame is the major ones grown mainly in North Western, Western and Central zones. Pulses are produced for making sauce which is consumed in daily farmers' food and for other purposes. Fababean yields 7.4 qt/ha in the region, whereas lentils 7 qt/ha. The productivity of ground nut was 11.5 qt/ha.

The productivity of cereals, pulses, oil crops and vegetables noted in the urban was higher than it was in rural areas probably because of intensive farming conducted in the relatively smaller farmland size which was owned by the urban householders.

The productivity of crops obtained in this survey was lesser by 27-70% when compared with the productivity of crops reported by CSA (2018) for the crop harvested in 2017/18. For instance,

the productivity of tef, barley, wheat, maize, sorghum and finger millet showed reduction of 27, 35, 28, 43, 38 and 66%, respectively. Crop productivity reported in this report was based on the questionnaire where farming household were asked how much they harvested per unit area. However, farmers deliberately or not might not tell the correct productivity. In the contrary, crop productivity reported by CSA was based on measurement from a unit of sampled plots.

**Table 3.3. 20:** Response of house holders for productivity of the crops they harvested

| Crop type | Region | | Urban | | | Infant Towns | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Prod. (qt $ha^{-1}$) | No. of HOUSEHOLD | Prod. (qt $ha^{-1}$) | No. of HOUSEHOLD | SD | Prod. (qt $ha^{-1}$) | No. of HOUSEHOLD | SD | Prod. (qt $ha^{-1}$) | No. of HOUSEHOLD | SD |
| **Cereals** | | | | | | | | | | | |
| Tef | 11.2 | 1806 | 15.3 | 122 | 10.7 | 9.3 | 199 | 8.1 | 8.9 | 1485 | 7.6 |
| Wheat | 14.2 | 994 | 19.5 | 81 | 11.07 | 10.7 | 91 | 9.5 | 12.3 | 822 | 12 |
| Barley | 11.7 | 850 | 14.6 | 54 | 10.1 | 10 | 88 | 7.5 | 10.4 | 708 | 8.4 |
| Kerkaeta | 10.6 | 65 | 15 | 2 | 7.1 | 7.4 | 13 | 5.2 | 9.5 | 50 | 6.5 |
| Sorghum | 17.6 | 1114 | 24.7 | 112 | 14.9 | 13.5 | 172 | 13 | 14.6 | 830 | 14.8 |
| Lequa | 15.2 | 30 | | | | 20 | 2 | 17 | 10.3 | 28 | 10.1 |
| Maize | 14.7 | 685 | 25.2 | 9 | 15.6 | 9.4 | 80 | 7.9 | 9.5 | 596 | 7.8 |
| Finger millet | 7.8 | 105 | | | | 7.6 | 16 | 4.6 | 8 | 89 | 7.7 |
| **Pulses** | | | | | | | | | | | |
| Faba bean | 7.4 | 26 | 10 | 4 | 4.4 | 5 | 2 | 1.4 | 7.2 | 20 | 6 |
| Pulses | 8.6 | 48 | 6.5 | 2 | 2.12 | 8.9 | 7 | 4 | 10.4 | 39 | 16 |
| Lentils | 6.9 | 25 | 7.4 | 4 | 3.9 | 6.5 | 8 | 3.7 | 6.9 | 13 | 6.2 |
| **Oil crops** | | | | | | | | | | | |
| Sesame | 8.1 | 152 | 5.2 | 44 | 6.4 | 10.1 | 58 | 11.9 | 9.1 | 50 | 10.2 |
| Linseed | 3.0 | 6 | | | | | | | 3 | 6 | 1.1 |
| Ground nut | 11.5 | 4 | | | | | | | 11.5 | 4 | 7.7 |
| **Vegetables** | | | | | | | | | | | |
| Vegetables | 115.2 | 10 | 320.97 | 7 | 286.5 | 20.5 | 2 | 27.6 | 4 | 1 | |
| **Root crops** | | | | | | | | | | | |
| Potatoes | 302.0 | 3 | 600 | 2 | 282.8 | | | | 4 | 1 | |
| Onion | 9.0 | 34 | | | | 13 | 2 | 9.9 | 5 | 32 | 27.1 |
| **Others** | 13.2 | 13 | | | | 4 | 1 | | 22.4 | 12 | 56.1 |
| Sasila | 24.0 | 1 | | | | | | | 24 | 1 | |

Cereals, pulses and oil crops are among the grain crops cultivated in the Tigray region. Among the cereal crops, tef, sorghum, wheat, barley, maize and finger millet were produced (Table 3.3.21). Pulses like fababean, and lentils were captured as important crops in this survey even though some other pulse crops like chick pea, field peas etc were also grown in the region. Among oil crops, sesame and linseed were captured in this survey and sesame was dominantly grown in the lowlands. Further information on distribution of cultivated land by crop type, and distribution of yield by crop type are indicated in Table 3.3.21 and Table 3.3.22, respectively.

**Table 3.3. 21:** Distribution of cultivated land (in ha) by crop type

| No. | Crop type & range of cultivated land (ha) | Response of HOUSEHOLD in % | | | | |
|---|---|---|---|---|---|---|
| | | Field 1 | Field 2 | Field 3 | Field 4 | Field 5 |
| **I** | **Cereal crops** | | | | | |
| | Tef | N=1703 | N=544 | N=257 | N=88 | N=29 |
| | <0.255 | 70.1 | 76.1 | 76.3 | 81.8 | 79.3 |
| | 0.256-0.505 | 20.0 | 17.6 | 15.2 | 11.4 | 20.7 |
| | 0.506-1.005 | 7.9 | 4.4 | 7.0 | 6.8 | 0.0 |
| | 1.006-2.005 | 1.8 | 1.7 | 1.6 | 0.0 | 0.0 |
| | 2.006-4.005 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 4.005-6.005 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 6.006-10.005 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 |
| | >10.005 | | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| | Wheat | N=918 | N=787 | N=234 | N=65 | N=9 |
| | <0.255 | 72.1 | 78.5 | 73.9 | 75.4 | 77.8 |
| | 0.256-0.505 | 23.2 | 17.8 | 22.2 | 21.5 | 22.2 |
| | 0.506-1.005 | 4.5 | 2.8 | 3.8 | 1.5 | 0.0 |
| | 1.006-2.005 | 0.2 | 0.4 | 0.0 | 1.5 | 0.0 |
| | 2.006-4.005 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 4.005-6.005 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| | 6.006-10.005 | 0.0 | 0.4 | 0.0 | 0.0 | 0.0 |
| | >10.005 | | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| | Barley | N=798 | N=483 | N=147 | N=33 | N=13 |
| | <0.255 | 72.6 | 73.9 | 76.2 | 78.8 | 92.3 |
| | 0.256-0.505 | 21.3 | 20.5 | 19.7 | 15.2 | 7.7 |
| | 0.506-1.005 | 5.5 | 4.1 | 3.4 | 6.1 | 0.0 |
| | 1.006-2.005 | 0.5 | 0.4 | 0.0 | 0.0 | 0.0 |
| | 2.006-4.005 | 0.0 | 0.4 | 0.7 | 0.0 | 0.0 |
| | 4.005-6.005 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 6.006-10.005 | | | | | |
| | >10.005 | | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| | Hanfetse | N=63 | N=130 | N=65 | N=17 | N=7 |

| No. | Crop type & range of cultivated land (ha) | Response of HOUSEHOLD in % | | | | |
|---|---|---|---|---|---|---|
| | | Field 1 | Field 2 | Field 3 | Field 4 | Field 5 |
| | <0.255 | 63.5 | 83.8 | 76.9 | 88.2 | 100.0 |
| | 0.256-0.505 | 25.4 | 13.8 | 15.4 | 5.9 | 0.0 |
| | 0.506-1.005 | 9.5 | 1.5 | 6.2 | 5.9 | 0.0 |
| | 1.006-2.005 | 1.6 | 0.0 | 1.5 | 0.0 | 0.0 |
| | 2.006-4.005 | | | | | |
| | 4.005-6.005 | | | | | |
| | 6.006-10.005 | | | | | |
| | >10.005 | | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| | Sorghum | N=1023 | N=808 | N=308 | N=67 | N=17 |
| | <0.255 | 68.5 | 66.7 | 72.7 | 74.6 | 70.6 |
| | 0.256-0.505 | 19.0 | 19.4 | 20.5 | 17.9 | 23.5 |
| | 0.506-1.005 | 10.1 | 10.1 | 4.2 | 6.0 | 5.9 |
| | 1.006-2.005 | 2.3 | 3.5 | 2.3 | 1.5 | 0.0 |
| | 2.006-4.005 | 0.1 | 0.1 | 0.3 | 0.0 | 0.0 |
| | 4.005-6.005 | | | | | |
| | 6.006-10.005 | | | | | |
| | >10.005 | | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| | Lequa | N=32 | N=60 | N=46 | N=20 | N=9 |
| | <0.255 | 75.0 | 80.0 | 87.0 | 90.0 | 88.9 |
| | 0.256-0.505 | 25.0 | 16.7 | 8.7 | 10.0 | 0.0 |
| | 0.506-1.005 | 0.0 | 3.3 | 4.3 | 0.0 | 11.1 |
| | 1.006-2.005 | | | | | |
| | 2.006-4.005 | | | | | |
| | 4.005-6.005 | | | | | |
| | 6.006-10.005 | | | | | |
| | >10.005 | | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| | Maize | N=690 | N=458 | N=149 | N=44 | N=11 |
| | <0.255 | 89.6 | 86.5 | 88.6 | 90.9 | 100.0 |
| | 0.256-0.505 | 7.2 | 10.7 | 10.7 | 4.5 | 0.0 |
| | 0.506-1.005 | 2.2 | 1.7 | 0.7 | 4.5 | 0.0 |
| | 1.006-2.005 | 1.0 | 0.9 | 0.0 | 0.0 | 0.0 |
| | 2.006-4.005 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 |
| | 4.005-6.005 | | | | | |
| | 6.006-10.005 | | | | | |
| | >10.005 | | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| | Finger millet | N=18 | N=278 | N=168 | N=65 | N=10 |
| | <0.255 | 72.2 | 78.4 | 81.5 | 86.2 | 100.0 |
| | 0.256-0.505 | 11.1 | 13.3 | 11.9 | 6.2 | 0.0 |
| | 0.506-1.005 | 16.7 | 4.3 | 4.2 | 4.6 | 0.0 |

| No. | Crop type & range of cultivated land (ha) | Response of HOUSEHOLD in % | | | | |
|---|---|---|---|---|---|---|
| | | Field 1 | Field 2 | Field 3 | Field 4 | Field 5 |
| | 1.006-2.005 | 0.0 | 4.0 | 1.8 | 3.1 | 0.0 |
| | 2.006-4.005 | | | | | |
| | 4.005-6.005 | | | | | |
| | 6.006-10.005 | | | | | |
| | >10.005 | | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| **II** | **Pulses** | | | | | |
| | Faba bean | N=24 | N=87 | N=105 | N=45 | N=11 |
| | <0.255 | 83.3 | 86.2 | 97.1 | 93.3 | 100.0 |
| | 0.256-0.505 | 12.5 | 12.6 | 2.9 | 2.2 | 0.0 |
| | 0.506-1.005 | 4.2 | 0.0 | 0.0 | 4.4 | 0.0 |
| | 1.006-2.005 | 0.0 | 1.1 | 0.0 | 0.0 | 0.0 |
| | 2.006-4.005 | | | | | |
| | 4.005-6.005 | | | | | |
| | 6.006-10.005 | | | | | |
| | >10.005 | | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| | Pulses | N=48 | N=82 | N=91 | N=31 | N=4 |
| | <0.255 | 64.6 | 82.9 | 84.6 | 93.5 | 100.0 |
| | 0.256-0.505 | 29.2 | 14.6 | 12.1 | 0.0 | |
| | 0.506-1.005 | 6.3 | 1.2 | 2.2 | 3.2 | |
| | 1.006-2.005 | 0.0 | 1.2 | 1.1 | 3.2 | |
| | 2.006-4.005 | | | | | |
| | 4.005-6.005 | | | | | |
| | 6.006-10.005 | | | | | |
| | >10.005 | | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| | Lentil | N=22 | N=39 | N=31 | N=16 | N=5 |
| | <0.255 | 77.3 | 92.3 | 90.3 | 87.5 | 80.0 |
| | 0.256-0.505 | 22.7 | 7.7 | 9.7 | 12.5 | 20.0 |
| | 0.506-1.005 | | | | | |
| | 1.006-2.005 | | | | | |
| | 2.006-4.005 | | | | | |
| | 4.005-6.005 | | | | | |
| | 6.006-10.005 | | | | | |
| | >10.005 | | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| **III** | **Oil Crops** | | | | | |
| | Sesame | N=110 | N=112 | N=35 | N=9 | N=2 |
| | <0.255 | 87.3 | 83.9 | 68.6 | 77.8 | 100.0 |
| | 0.256-0.505 | 8.2 | 8.0 | 8.6 | 22.2 | 0.0 |
| | 0.506-1.005 | 4.5 | 1.8 | 11.4 | | |
| | 1.006-2.005 | | 6.3 | 11.4 | | |

| No. | Crop type & range of cultivated land (ha) | Response of HOUSEHOLD in % | | | | |
|---|---|---|---|---|---|---|
| | | Field 1 | Field 2 | Field 3 | Field 4 | Field 5 |
| | 2.006-4.005 | | | | | |
| | 4.005-6.005 | | | | | |
| | 6.006-10.005 | | | | | |
| | >10.005 | | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| | Ground nut | N=4 | N=11 | N=9 | N=3 | |
| | <0.255 | 50.0 | 54.5 | 66.7 | 100.0 | |
| | 0.256-0.505 | 25.0 | 36.4 | 11.1 | | |
| | 0.506-1.005 | 25.0 | 9.1 | 22.2 | | |
| | 1.006-2.005 | | | | | |
| | 2.006-4.005 | | | | | |
| | 4.005-6.005 | | | | | |
| | 6.006-10.005 | | | | | |
| | >10.005 | | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | |
| | Linseed | N=7 | N=11 | N=17 | N=7 | N=1 |
| | <0.255 | 100.0 | 100.0 | 82.4 | 100.0 | |
| | 0.256-0.505 | | 10.0 | 11.8 | | |
| | 0.506-1.005 | | | 5.9 | | |
| | 1.006-2.005 | | | | | |
| | 2.006-4.005 | | | | | |
| | 4.005-6.005 | | | | | |
| | 6.006-10.005 | | | | | |
| | >10.005 | | | | | |
| | Total | | | | | |
| | Others | N=107 | N=29 | N=30 | N=13 | N=3 |
| | <0.255 | 72.9 | 62.1 | 73.3 | 69.2 | 66.7 |
| | 0.256-0.505 | 17.8 | 20.7 | 16.7 | 30.8 | 33.3 |
| | 0.506-1.005 | 8.4 | 13.8 | 6.7 | | |
| | 1.006-2.005 | 0.9 | 3.4 | 3.3 | | |
| | 2.006-4.005 | | | | | |
| | 4.005-6.005 | | | | | |
| | 6.006-10.005 | | | | | |
| | >10.005 | | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Table 3.3. 22:** Distribution of yield (in quintal) by crop type

| No. | Crop type & range of cultivated land (qt) | Response of HOUSEHOLD in % | | | |
|---|---|---|---|---|---|
| | | Field 1 | Field 2 | Field 3 | Field 4 |
| **I.** | **Cereals** | | | | |
| | Tef | N=976 | N=233 | N=75 | N=20 |
| | <1.05 | 29.7 | 32.2 | 49.3 | 70.0 |
| | 1.06-2.05 | 27.0 | 22.3 | 28.0 | 5.0 |
| | 2.06-5.05 | 31.7 | 24.0 | 18.7 | 20.0 |
| | 5.06-10.05 | 7.8 | 13.7 | 2.7 | 0.0 |
| | 10.06-20.05 | 3.0 | 3.0 | 1.3 | 0.0 |
| | 20.06-30.05 | 0.4 | 0.4 | 0.0 | 0.0 |
| | 30.06-40.05 | 0.1 | 0.0 | 0.0 | 0.0 |
| | 40.06-50.05 | 0.1 | 0.0 | 0.0 | 0.0 |
| | 50.06-100.5 | 0.0 | 3.9 | 0.0 | 0.0 |
| | >100.5 | 0.2 | 0.4 | 0.0 | 5.0 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |
| | Wheat | N=489 | N=398 | N=105 | N=14 |
| | <1.05 | 24.7 | 21.4 | 21.0 | 28.6 |
| | 1.06-2.05 | 21.7 | 25.6 | 21.9 | 21.4 |
| | 2.06-5.05 | 32.7 | 36.2 | 39.0 | 35.7 |
| | 5.06-10.05 | 18.0 | 13.3 | 16.2 | 7.1 |
| | 10.06-20.05 | 1.8 | 2.3 | 0.0 | 7.1 |
| | 20.06-30.05 | 0.2 | 0.0 | 1.0 | 0.0 |
| | 30.06-40.05 | 0.2 | 0.3 | 0.0 | 0.0 |
| | 40.06-50.05 | 0.2 | 0.5 | 0.0 | 0.0 |
| | 50.06-100.5 | 0.2 | 0.0 | 0.0 | 0.0 |
| | >100.5 | 0.2 | 0.5 | 1.0 | 0.0 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |
| | Barely | N=460 | N=228 | N=34 | N=11 |
| | <1.05 | 24.1 | 24.1 | 29.4 | 9.1 |
| | 1.06-2.05 | 24.6 | 22.4 | 20.6 | 27.3 |
| | 2.06-5.05 | 32.8 | 38.6 | 41.2 | 54.5 |
| | 5.06-10.05 | 15.0 | 12.7 | 5.9 | 0.0 |
| | 10.06-20.05 | 2.4 | 1.3 | 0.0 | 9.1 |
| | 20.06-30.05 | 0.4 | 0.0 | 0.0 | 0.0 |
| | 30.06-40.05 | | | | |
| | 40.06-50.05 | | | | |
| | 50.06-100.5 | | | | |
| | >100.5 | 0.7 | 0.9 | 2.9 | 0.0 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |
| | Hanfetse | N=29 | N=75 | N=37 | N=3 |
| | <1.05 | 20.7 | 22.7 | 24.3 | 33.3 |
| | 1.06-2.05 | 34.5 | 24.0 | 35.1 | 0.0 |
| | 2.06-5.05 | 31.0 | 42.7 | 29.7 | 66.7 |

| No. | Crop type & range of cultivated land (qt) | Response of HOUSEHOLD in % | | | |
|---|---|---|---|---|---|
| | | Field 1 | Field 2 | Field 3 | Field 4 |
| | 5.06-10.05 | 10.3 | 10.7 | 8.1 | 0.0 |
| | 10.06-20.05 | 3.4 | 0.0 | 0.0 | 0.0 |
| | 20.06-30.05 | | | | |
| | 30.06-40.05 | | | | |
| | 40.06-50.05 | | | | |
| | 50.06-100.5 | 0.0 | 0.0 | 2.7 | 0.0 |
| | >100.5 | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |
| | Sorghum | N=451 | N=378 | N=189 | N=66 |
| | <1.05 | 22.2 | 19.0 | 16.9 | 22.7 |
| | 1.06-2.05 | 17.3 | 21.2 | 20.1 | 22.7 |
| | 2.06-5.05 | 31.3 | 30.7 | 38.6 | 34.8 |
| | 5.06-10.05 | 15.5 | 18.0 | 18.0 | 16.7 |
| | 10.06-20.05 | 9.8 | 7.1 | 3.7 | 1.5 |
| | 20.06-30.05 | 2.0 | 2.4 | 0.0 | 0.0 |
| | 30.06-40.05 | 0.4 | 0.3 | 0.0 | 0.0 |
| | 40.06-50.05 | 0.9 | 0.5 | 0.5 | 1.5 |
| | 50.06-100.5 | 0.7 | 0.5 | 2.1 | 0.0 |
| | >100.5 | 0.0 | 0.3 | 0.0 | 0.0 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |
| | Lequa | N=14 | N=30 | N=16 | N=9 |
| | <1.05 | 42.9 | 30.0 | 56.3 | 77.8 |
| | 1.06-2.05 | 21.4 | 30.0 | 18.8 | 0.0 |
| | 2.06-5.05 | 21.4 | 30.0 | 25.0 | 22.2 |
| | 5.06-10.05 | 7.1 | 10.0 | 0.0 | 0.0 |
| | 10.06-20.05 | 7.1 | 0.0 | 0.0 | 0.0 |
| | 20.06-30.05 | | | | |
| | 30.06-40.05 | | | | |
| | 40.06-50.05 | | | | |
| | 50.06-100.5 | | | | |
| | >100.5 | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |
| | Maize | N=238 | N=256 | N=108 | N=30 |
| | <1.05 | 33.6 | 27.3 | 33.3 | 50.0 |
| | 1.06-2.05 | 23.1 | 27.7 | 26.9 | 36.7 |
| | 2.06-5.05 | 29.4 | 27.7 | 30.6 | 13.3 |
| | 5.06-10.05 | 10.9 | 13.7 | 9.3 | 0.0 |
| | 10.06-20.05 | 1.7 | 2.3 | 0.0 | 0.0 |
| | 20.06-30.05 | 0.0 | 0.8 | 0.0 | 0.0 |
| | 30.06-40.05 | | | | |
| | 40.06-50.05 | | | | |
| | 50.06-100.5 | 0.8 | 0.4 | 0.0 | 0.0 |
| | >100.5 | 0.4 | 0.0 | 0.0 | 0.0 |

| No. | Crop type & range of cultivated land (qt) | Response of HOUSEHOLD in % | | | |
|---|---|---|---|---|---|
| | | Field 1 | Field 2 | Field 3 | Field 4 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |
| | Finger millet | N=26 | N=26 | N=27 | N=6 |
| | <1.05 | 26.9 | 53.8 | 29.6 | 83.3 |
| | 1.06-2.05 | 26.9 | 19.2 | 18.5 | 0.0 |
| | 2.06-5.05 | 23.1 | 15.4 | 33.3 | 0.0 |
| | 5.06-10.05 | 7.7 | 3.8 | 14.8 | 0.0 |
| | 10.06-20.05 | 11.5 | 3.8 | 0.0 | 0.0 |
| | 20.06-30.05 | 0.0 | 3.8 | 0.0 | 0.0 |
| | 30.06-40.05 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 40.06-50.05 | 3.8 | 0.0 | 0.0 | 16.7 |
| | 50.06-100.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| | >100.5 | 0.0 | 0.0 | 3.7 | 0.0 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |
| **II** | **Pulses** | | | | |
| | Faba bean | N=9 | N=39 | N=54 | N=20 |
| | <1.05 | 55.6 | 53.8 | 66.7 | 60.0 |
| | 1.06-2.05 | 22.2 | 15.4 | 14.8 | 30.0 |
| | 2.06-5.05 | 11.1 | 28.2 | 18.5 | 5.0 |
| | 5.06-10.05 | 11.1 | 2.6 | 0.0 | 5.0 |
| | 10.06-20.05 | | | | |
| | 20.06-30.05 | | | | |
| | 30.06-40.05 | | | | |
| | 40.06-50.05 | | | | |
| | 50.06-100.5 | | | | |
| | >100.5 | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |
| | Pulses | N=29 | N=28 | N=58 | N=21 |
| | <1.05 | 44.8 | 60.7 | 56.9 | 38.1 |
| | 1.06-2.05 | 37.9 | 7.1 | 12.1 | 23.8 |
| | 2.06-5.05 | 13.8 | 25.0 | 13.8 | 28.6 |
| | 5.06-10.05 | 3.4 | 3.6 | 1.7 | 4.8 |
| | 10.06-20.05 | 0.0 | 3.6 | 0.0 | 0.0 |
| | 20.06-30.05 | | | | |
| | 30.06-40.05 | | | | |
| | 40.06-50.05 | | | | |
| | 50.06-100.5 | 0.0 | 0.0 | 15.5 | 4.8 |
| | >100.5 | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |
| | Lentil | N=14 | N=21 | N=20 | N=4 |
| | <1.05 | 35.7 | 76.2 | 85.0 | 75.0 |
| | 1.06-2.05 | 21.4 | 9.5 | 15.0 | 25.0 |
| | 2.06-5.05 | 28.6 | 14.3 | | |
| | 5.06-10.05 | 0.0 | | | |

| No. | Crop type & range of cultivated land (qt) | Response of HOUSEHOLD in % | | | |
|---|---|---|---|---|---|
| | | Field 1 | Field 2 | Field 3 | Field 4 |
| | 10.06-20.05 | 7.1 | | | |
| | 20.06-30.05 | 0.0 | | | |
| | 30.06-40.05 | 0.0 | | | |
| | 40.06-50.05 | 7.1 | | | |
| | 50.06-100.5 | | | | |
| | >100.5 | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |
| **III** | **Oil Crops** | | | | |
| | Sesame | N=57 | N=30 | N=32 | N=6 |
| | <1.05 | 15.8 | 30.0 | 28.1 | 16.7 |
| | 1.06-2.05 | 14.0 | 16.7 | 28.1 | 50.0 |
| | 2.06-5.05 | 29.8 | 33.3 | 15.6 | 0.0 |
| | 5.06-10.05 | 19.3 | 6.7 | 15.6 | 16.7 |
| | 10.06-20.05 | 10.5 | 10.0 | 9.4 | 16.7 |
| | 20.06-30.05 | 5.3 | 3.3 | 0.0 | 0.0 |
| | 30.06-40.05 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 40.06-50.05 | 3.5 | 0.0 | 0.0 | 0.0 |
| | 50.06-100.5 | 1.8 | 0.0 | 3.1 | 0.0 |
| | >100.5 | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |
| | Ground nut | N=3 | N=7 | N=4 | N=3 |
| | <1.05 | 0.0 | 28.6 | 50.0 | 33.3 |
| | 1.06-2.05 | 33.3 | 28.6 | 25.0 | 0.0 |
| | 2.06-5.05 | 66.7 | 28.6 | 25.0 | 33.3 |
| | 5.06-10.05 | 0.0 | 14.3 | 0.0 | 33.3 |
| | 10.06-20.05 | | | | |
| | 20.06-30.05 | | | | |
| | 30.06-40.05 | | | | |
| | 40.06-50.05 | | | | |
| | 50.06-100.5 | | | | |
| | >100.5 | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |
| | Linseed | N=1 | N=3 | N=3 | N=5 |
| | <1.05 | | 100.0 | 66.7 | 80.0 |
| | 1.06-2.05 | | | 0.0 | 20.0 |
| | 2.06-5.05 | | | 33.3 | 0.0 |
| | 5.06-10.05 | | | | |
| | 10.06-20.05 | 100.0 | | | |
| | 20.06-30.05 | | | | |
| | 30.06-40.05 | | | | |
| | 40.06-50.05 | | | | |
| | 50.06-100.5 | | | | |
| | >100.5 | | | | |

| No. | Crop type & range of cultivated land (qt) | Response of HOUSEHOLD in % | | | |
|---|---|---|---|---|---|
| | | Field 1 | Field 2 | Field 3 | Field 4 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |

### 3.3.1.5.2. Perennial Crops

Perennial crops are crops which are grown and occupy land for a long period of time, not requiring replanting for several years after each harvest. They are also synonymously called as permanent crops. All fruit trees (i.e. oranges, mandarin, bananas, etc) and trees for beverages (i.e. coffee, tea, hops (Gesho), etc) are considered as permanent crops (CSA, 2018).

Table 3.3.23 shows the response of household on having perennial crops, and 28% of the sampled household in the Tigray region had perennial plants. The percentage of household who had perennial crops was higher in the rural areas (31%) than in the infant towns (15%).

Table 3.3.24 shows the distribution of perennial crops (in number) by the householders surveyed. Oranges, cactus, papaya, avocado, lemon and banana were among the fruit crops captured during the study. Excepting cactus and banana, above 85% of the household owned fruit trees in the ranges of 1 to 50. Cactus was known fruit tree which was also used for fencing gardens and crop fields. About 46% of the household owned cactus plants in the ranges of 1-50, while 24% of the household had 101-500 cactus plants. Stimulants like coffee, hops and chaat are also grown in different parts of the region. Hops were the dominant ones. The number of hops and coffee trees were owned by 90% of the household were 1-50. In line with this, Tables 3.3.25 and 3.3.26 show the distribution of perennial crops ready for harvest (in number) by crop type, and the distribution of perennial crop's yield (in quintal) by crop type.

**Table 3.3. 23:** Response of households on having perennial crops

| No. | Response | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=8145) | Infant Towns (N=1687) | Rural (N=6458) |
| 1 | Yes | 28.0 | 15.2 | 31.4 |
| 2 | No | 72.0 | 84.8 | 68.6 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 24:** Distribution of perennial crops (in number) by crop type

| No. | No. of plants | Response of HOUSEHOLD in % | | | |
|---|---|---|---|---|---|
| | | Field 1 | Field 2 | Field 3 | Field 4 |
| **I** | **Fruit crops** | | | | |
| | Orange | N=35 | N=47 | N=29 | N=10 |
| | 1-50 | 91.4 | 93.6 | 96.6 | 100.0 |
| | 51-100 | 5.7 | 4.3 | 0.0 | |
| | 101-500 | 2.9 | 2.1 | 3.4 | |
| | 501-1000 | | | | |
| | 1001-2000 | | | | |
| | >2000 | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |
| | Cactus | N=153 | N=268 | N=71 | N=16 |
| | 1-50 | 46.4 | 36.6 | 43.7 | 43.8 |
| | 51-100 | 19.0 | 22.4 | 22.5 | 6.3 |
| | 101-500 | 24.2 | 24.3 | 26.8 | 37.5 |
| | 501-1000 | 2.6 | 8.6 | 1.4 | 6.3 |
| | 1001-2000 | 2.0 | 3.4 | 1.4 | 6.3 |
| | >2000 | 5.9 | 4.9 | 4.2 | 0.0 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |
| | Guava | N=34 | N=41 | N=34 | N=15 |
| | 1-50 | 88.2 | 90.2 | 94.1 | 100.0 |
| | 51-100 | 8.8 | 2.4 | 2.9 | 0.0 |
| | 101-500 | 2.9 | 7.3 | 2.9 | 0.0 |
| | 501-1000 | | | | |
| | 1001-2000 | | | | |
| | >2000 | | | | |
| | Total | | | | |
| | Papaya | N=39 | N=26 | N=10 | N=7 |
| | 1-50 | 100.0 | 100.0 | 100.0 | 100.0 |
| | 51-100 | | | | |
| | 101-500 | | | | |
| | 501-1000 | | | | |
| | 1001-2000 | | | | |
| | >2000 | | | | |
| | Total | | | | |
| | Avocado | N=18 | N=13 | N=15 | N=7 |
| | 1-50 | 100.0 | 100.0 | 100.0 | 100.0 |
| | 51-100 | | | | |
| | 101-500 | | | | |
| | 501-1000 | | | | |
| | 1001-2000 | | | | |
| | >2000 | | | | |
| | Total | | | | |

| No. | No. of plants | Response of HOUSEHOLD in % | | | |
|---|---|---|---|---|---|
| | | Field 1 | Field 2 | Field 3 | Field 4 |
| | Lemon | N=27 | N=34 | N-24 | N=14 |
| | 1-50 | 100.0 | 100.0 | 100.0 | 100.0 |
| | 51-100 | | | | |
| | 101-500 | | | | |
| | 501-1000 | | | | |
| | 1001-2000 | | | | |
| | >2000 | | | | |
| | Total | | | | |
| | Banana | N=5 | N=10 | N=6 | N=5 |
| | 1-50 | 40.0 | 100.0 | 100.0 | 100.0 |
| | 51-100 | 0.0 | | | |
| | 101-500 | 20.0 | | | |
| | 501-1000 | | | | |
| | 1001-2000 | | | | |
| | >2000 | 40.0 | | | |
| | Total | 100.0 | | | |
| **II** | **Stimulants** | | | | |
| | Coffee | N=64 | N=15 | N=11 | N=8 |
| | 1-50 | 90.6 | 100.0 | 100.0 | 100.0 |
| | 51-100 | 1.6 | | | |
| | 101-500 | 7.8 | | | |
| | 501-1000 | | | | |
| | 1001-2000 | | | | |
| | >2000 | | | | |
| | Total | | | | |
| | Hops (Gesho) | N=510 | N=183 | N=39 | N=9 |
| | 1-50 | 90.0 | 88.0 | 87.2 | 100.0 |
| | 51-100 | 6.1 | 7.1 | 10.3 | |
| | 101-500 | 2.5 | 4.4 | 2.6 | |
| | 501-1000 | 0.6 | 0.5 | 0.0 | |
| | 1001-2000 | 0.6 | 0.0 | 0.0 | |
| | >2000 | 0.2 | 0.0 | 0.0 | |
| | Total | | | | |
| | Chaat | N=28 | N=15 | N=2 | |
| | 1-50 | 57.1 | 53.3 | 50.0 | 0.0 |
| | 51-100 | 25.0 | 6.7 | 0.0 | |
| | 101-500 | 17.9 | 20.0 | 50.0 | |
| | 501-1000 | 0.0 | 20.0 | 0.0 | |
| | 1001-2000 | 0.0 | 0.0 | 0.0 | |
| | >2000 | 0.0 | 0.0 | 0.0 | |
| | Total | 100.0 | 100.0 | 100.0 | |
| **III** | **Eucalyptus** | N=1175 | N=249 | N=29 | N=6 |
| | 1-50 | 75.5 | 74.7 | 65.5 | 50.0 |

| No. | No. of plants | Response of HOUSEHOLD in % | | | |
|---|---|---|---|---|---|
| | | Field 1 | Field 2 | Field 3 | Field 4 |
| | 51-100 | 11.9 | 8.8 | 13.8 | 16.7 |
| | 101-500 | 10.8 | 12.0 | 13.8 | 33.3 |
| | 501-1000 | 1.4 | 2.8 | 0.0 | 0.0 |
| | 1001-2000 | 0.2 | 1.2 | 6.9 | 0.0 |
| | >2000 | 0.3 | 0.4 | 0.0 | 0.0 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |
| **IV** | **Others** | N=77 | N=45 | N=32 | N=17 |
| | 1-50 | 89.6 | 88.9 | 87.5 | 94.1 |
| | 51-100 | 3.9 | 4.4 | 3.1 | 5.9 |
| | 101-500 | 3.9 | 6.7 | 9.4 | 0.0 |
| | 501-1000 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 1001-2000 | 0.0 | 0.0 | 0.0 | 0.0 |
| | >2000 | 2.6 | 0.0 | 0.0 | 0.0 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |

**Table 3.3. 25:** Distribution of perennial crops ready for harvest (in number) by crop type

| No. | No. of plants | Response of HOUSEHOLD in % | | | |
|---|---|---|---|---|---|
| | | Field 1 | Field 2 | Field 3 | Field 4 |
| **I** | **Fruit crops** | | | | |
| | Orange | N=26 | N=24 | N=12 | N=10 |
| | 1-50 | 96.2 | 100.0 | 100.0 | 100.0 |
| | 51-100 | 3.8 | 0.0 | 0.0 | 0.0 |
| | 101-500 | | | | |
| | 501-1000 | | | | |
| | 1001-2000 | | | | |
| | >2000 | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |
| | Cactus | N=137 | N=246 | N=61 | N=12 |
| | 1-50 | 48.9 | 42.7 | 44.3 | 58.3 |
| | 51-100 | 18.2 | 19.9 | 21.3 | 0.0 |
| | 101-500 | 22.6 | 21.5 | 26.2 | 33.3 |
| | 501-1000 | 2.9 | 8.5 | 1.6 | 0.0 |
| | 1001-2000 | 2.2 | 2.0 | 3.3 | 8.3 |
| | >2000 | 5.1 | 5.3 | 3.3 | 0.0 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |
| | Guava | N=13 | N=30 | N=19 | N=12 |
| | 1-50 | 69.2 | 90.0 | 100.0 | 100.0 |
| | 51-100 | 23.1 | 3.3 | 0.0 | 0.0 |
| | 101-500 | 7.7 | 6.7 | 0.0 | 0.0 |
| | 501-1000 | | | | |
| | 1001-2000 | | | | |
| | >2000 | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |
| | Papaya | N=8 | N=19 | N=3 | N=5 |
| | 1-50 | 100.0 | 100.0 | 100.0 | 100.0 |
| | 51-100 | | | | |
| | 101-500 | | | | |
| | 501-1000 | | | | |
| | 1001-2000 | | | | |
| | >2000 | | | | |
| | Total | | | | |
| | Avocado | N=4 | N=3 | N=5 | N=3 |
| | 1-50 | 100.0 | 100.0 | 100.0 | 100.0 |
| | 51-100 | | | | |
| | 101-500 | | | | |
| | 501-1000 | | | | |
| | 1001-2000 | | | | |
| | >2000 | | | | |
| | Total | | | | |
| | Lemon | N=8 | N=29 | N=7 | N=9 |

| | | | | | |
|---|---|---|---|---|---|
| | 1-50 | 100.0 | 100.0 | 100.0 | 100.0 |
| | 51-100 | | | | |
| | 101-500 | | | | |
| | 501-1000 | | | | |
| | 1001-2000 | | | | |
| | >2000 | | | | |
| | Total | | | | |
| | Banana | N=1 | N=9 | N=5 | N=3 |
| | 1-50 | 100.0 | 100.0 | 100.0 | 100.0 |
| | 51-100 | | | | |
| | 101-500 | | | | |
| | 501-1000 | | | | |
| | 1001-2000 | | | | |
| | >2000 | | | | |
| | Total | | | | |
| **II** | **Stimulants** | | | | |
| | Coffee | N=28 | N=12 | N=4 | N=6 |
| | 1-50 | 89.3 | 100.0 | 100.0 | 100.0 |
| | 51-100 | 3.6 | | | |
| | 101-500 | 7.1 | | | |
| | 501-1000 | | | | |
| | 1001-2000 | | | | |
| | >2000 | | | | |
| | Total | | | | |
| | Gesho | N=325 | N=155 | N=27 | N=6 |
| | 1-50 | 91.4 | 89.7 | 92.6 | 100.0 |
| | 51-100 | 4.6 | 6.5 | 3.7 | 0.0 |
| | 101-500 | 3.4 | 3.2 | 3.7 | 0.0 |
| | 501-1000 | 0.3 | 0.6 | 0.0 | 0.0 |
| | 1001-2000 | 0.3 | 0.0 | 0.0 | 0.0 |
| | >2000 | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |
| | Chat | N=45 | N=9 | N=1 | 0 |
| | 1-50 | 28.9 | 100.0 | 100.0 | 0.0 |
| | 51-100 | 15.6 | | | |
| | 101-500 | 44.4 | | | |
| | 501-1000 | 11.1 | | | |
| | 1001-2000 | 0.0 | | | |
| | >2000 | 0.0 | | | |
| | Total | 100.0 | | | |
| **III** | **Eucalyptus** | N=980 | N=221 | N=16 | N=4 |
| | 1-50 | 82.0 | 78.3 | 75.0 | 50.0 |
| | 51-100 | 9.2 | 10.0 | 6.3 | 25.0 |
| | 101-500 | 7.6 | 8.6 | 18.8 | 25.0 |
| | 501-1000 | 1.0 | 3.2 | 0.0 | 0.0 |
| | 1001-2000 | 0.2 | 0.0 | 0.0 | 0.0 |
| | >2000 | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |
| **IV** | **Others** | N=34 | N=32 | N=10 | N=10 |
| | 1-50 | 94.1 | 84.4 | 90.0 | 100.0 |
| | 51-100 | 5.9 | 9.4 | 0.0 | 0.0 |
| | 101-500 | 0.0 | 6.3 | 10.0 | 0.0 |
| | 501-1000 | | | | |
| | 1001-2000 | | | | |
| | >2000 | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |

**Table 3.3. 26:** Distribution of yield (in quintal) by crop type

| No. | Crop type & range of cultivated land (qt) | Response of HOUSEHOLD in % | | | |
|---|---|---|---|---|---|
| | | Field 1 | Field 2 | Field 3 | Field 4 |
| **I** | **Fruit crops** | | | | |
| | Orange | 15 | 4 | 0 | 2 |
| | <1.05 | 46.7 | 25.0 | | 100.0 |
| | 1.06-2.05 | 20.0 | 50.0 | | |
| | 2.06-5.05 | 6.7 | | | |
| | 5.06-10.05 | 13.3 | | | |
| | 10.06-20.05 | 6.7 | | | |
| | 20.06-30.05 | 6.7 | | | |
| | 30.06-40.05 | | | | |
| | 40.06-50.05 | | 25.0 | | |
| | 50.06-100.5 | | | | |
| | >100.5 | | | | |
| | Total | 100.0 | 100.0 | | 100.0 |
| | Cactus | 34 | 0 | 11 | 8 |
| | <1.05 | | | | |
| | 1.06-2.05 | | | | |
| | 2.06-5.05 | 14.7 | | | 25.0 |
| | 5.06-10.05 | 11.8 | | | |
| | 10.06-20.05 | 11.8 | | | 12.5 |
| | 20.06-30.05 | | | 27.3 | |
| | 30.06-40.05 | 8.8 | | | |
| | 40.06-50.05 | 8.8 | | 36.4 | 25.0 |
| | 50.06-100.5 | 14.7 | | 18.2 | 25.0 |
| | >100.5 | 29.4 | | 18.2 | 12.5 |
| | Total | 100.0 | | 100.0 | 100.0 |
| | Guava | 6 | 4 | 7 | 1 |
| | <1.05 | 50.0 | 50.0 | 42.9 | |
| | 1.06-2.05 | | | 28.6 | |
| | 2.06-5.05 | 16.7 | | | |
| | 5.06-10.05 | | | | |
| | 10.06-20.05 | 33.3 | | | |
| | 20.06-30.05 | | 0.0 | 14.3 | 0.0 |

| No. | Crop type & range of cultivated land (qt) | Response of HOUSEHOLD in % | | | |
|---|---|---|---|---|---|
| | | Field 1 | Field 2 | Field 3 | Field 4 |
| | 30.06-40.05 | | 25.0 | | |
| | 40.06-50.05 | | 0.0 | | |
| | 50.06-100.5 | | 25.0 | 14.3 | 0.0 |
| | >100.5 | | | | 100.0 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |
| | Papaya | 8 | 5 | 1 | 1 |
| | <1.05 | 37.5 | 40.0 | | |
| | 1.06-2.05 | 12.5 | 40.0 | | |
| | 2.06-5.05 | 37.5 | | | |
| | 5.06-10.05 | 12.5 | 20.0 | | |
| | 10.06-20.05 | | | | |
| | 20.06-30.05 | | | 100.0 | |
| | 30.06-40.05 | | | | |
| | 40.06-50.05 | | | | 100.0 |
| | 50.06-100.5 | | | | |
| | >100.5 | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |
| | Lemon | 3 | 3 | 4 | 3 |
| | <1.05 | 33.3 | 33.3 | 50.0 | 33.3 |
| | 1.06-2.05 | | | 25.0 | 66.7 |
| | 2.06-5.05 | 33.3 | | 25.0 | |
| | 5.06-10.05 | 33.3 | | | |
| | 10.06-20.05 | | 33.3 | | |
| | 20.06-30.05 | | | | |
| | 30.06-40.05 | | | | |
| | 40.06-50.05 | | | | |
| | 50.06-100.5 | | | | |
| | >100.5 | | 33.3 | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |
| | Banana | 1 | 3 | 0 | 2 |
| | <1.05 | 0.0 | 33.3 | | 50.0 |
| | 1.06-2.05 | 100.0 | 0.0 | | |
| | 2.06-5.05 | | 0.0 | | |
| | 5.06-10.05 | | 0.0 | | |
| | 10.06-20.05 | | 33.3 | | |
| | 20.06-30.05 | | 0.0 | | |
| | 30.06-40.05 | | 0.0 | | |
| | 40.06-50.05 | | 33.3 | | |
| | 50.06-100.5 | | | | |
| | >100.5 | | | | 50.0 |
| | Total | 100.0 | 100.0 | | 100.0 |
| **II** | **Vegetables** | 6 | 3 | 4 | 2 |
| | <1.05 | 50.0 | 33.3 | 0.0 | |
| | 1.06-2.05 | | 33.3 | 25.0 | |

| No. | Crop type & range of cultivated land (qt) | Response of HOUSEHOLD in % | | | |
|---|---|---|---|---|---|
| | | Field 1 | Field 2 | Field 3 | Field 4 |
| | 2.06-5.05 | | | 25.0 | |
| | 5.06-10.05 | | | | 100.0 |
| | 10.06-20.05 | 16.7 | | | |
| | 20.06-30.05 | 0.0 | | | |
| | 30.06-40.05 | 16.7 | | | |
| | 40.06-50.05 | | 33.3 | 25.0 | |
| | 50.06-100.5 | | | 0.0 | |
| | >100.5 | 16.7 | | 25.0 | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |
| **III** | **Root crops** | | | | |
| | Onion | 7 | 4 | 4 | 3 |
| | <1.05 | 28.6 | 0.0 | 0.0 | 0.0 |
| | 1.06-2.05 | 14.3 | 0.0 | 25.0 | 33.3 |
| | 2.06-5.05 | 28.6 | 50.0 | 0.0 | 0.0 |
| | 5.06-10.05 | 0.0 | 25.0 | 25.0 | 33.3 |
| | 10.06-20.05 | 28.6 | 25.0 | | |
| | 20.06-30.05 | | | | 33.3 |
| | 30.06-40.05 | | | 25.0 | |
| | 40.06-50.05 | | | | |
| | 50.06-100.5 | | | | |
| | >100.5 | | | 25.0 | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |
| **IV** | **Stimulants** | | | | |
| | Coffee | 7 | 5 | 3 | 2 |
| | <1.05 | 57.1 | 20.0 | 100.0 | 50.0 |
| | 1.06-2.05 | 0.0 | 40.0 | 0.0 | 50.0 |
| | 2.06-5.05 | 14.3 | 40.0 | | |
| | 5.06-10.05 | | | | |
| | 10.06-20.05 | | | | |
| | 20.06-30.05 | 14.3 | | | |
| | 30.06-40.05 | | | | |
| | 40.06-50.05 | | | | |
| | 50.06-100.5 | | | | |
| | >100.5 | 14.3 | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |
| | Gesho | 82 | 35 | 24 | 12 |
| | <1.05 | 47.6 | 42.9 | 29.2 | 58.3 |
| | 1.06-2.05 | 15.9 | 8.6 | 12.5 | 0.0 |
| | 2.06-5.05 | 18.3 | 31.4 | 37.5 | 33.3 |
| | 5.06-10.05 | 7.3 | 14.3 | 12.5 | 0.0 |
| | 10.06-20.05 | 7.3 | 0.0 | 8.3 | 0.0 |
| | 20.06-30.05 | 2.4 | | | 8.3 |
| | 30.06-40.05 | | | | |
| | 40.06-50.05 | | | | |

| No. | Crop type & range of cultivated land (qt) | Response of HOUSEHOLD in % | | | |
|---|---|---|---|---|---|
| | | Field 1 | Field 2 | Field 3 | Field 4 |
| | 50.06-100.5 | 1.2 | 2.9 | | |
| | >100.5 | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |
| | Chat | 18 | 3 | 6 | 2 |
| | <1.05 | 33.3 | 0.0 | 16.7 | |
| | 1.06-2.05 | 22.2 | 0.0 | 16.7 | |
| | 2.06-5.05 | 33.3 | 33.3 | | |
| | 5.06-10.05 | 5.6 | 0.0 | 16.7 | |
| | 10.06-20.05 | | 33.3 | 16.7 | 50.0 |
| | 20.06-30.05 | | | | |
| | 30.06-40.05 | | | | |
| | 40.06-50.05 | | 33.3 | | |
| | 50.06-100.5 | 5.6 | | | 50.0 |
| | >100.5 | | | 33.3 | 0.0 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |
| | Sugarcane | 1 | 8 | 0 | 0 |
| | <1.05 | | | | |
| | 1.06-2.05 | | | | |
| | 2.06-5.05 | | 12.5 | | |
| | 5.06-10.05 | | | | |
| | 10.06-20.05 | | 12.5 | | |
| | 20.06-30.05 | | 25.0 | | |
| | 30.06-40.05 | | | | |
| | 40.06-50.05 | 100.0 | | | |
| | 50.06-100.5 | | 12.5 | | |
| | >100.5 | | 37.5 | | |
| | Total | 100.0 | 100.0 | | |
| **V** | **Others** | 45 | 84 | 189 | 53 |
| | <1.05 | 33.3 | 34.5 | 29.1 | 39.6 |
| | 1.06-2.05 | 31.1 | 39.3 | 29.6 | 20.8 |
| | 2.06-5.05 | 17.8 | 15.5 | 32.8 | 34.0 |
| | 5.06-10.05 | 13.3 | 10.7 | 8.5 | 1.9 |
| | 10.06-20.05 | 2.2 | 0.0 | 0.0 | 3.8 |
| | 20.06-30.05 | | | | |
| | 30.06-40.05 | 2.2 | 0.0 | 0.0 | 0.0 |
| | 40.06-50.05 | | | | |
| | 50.06-100.5 | | | | |
| | >100.5 | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |

### *3.3.1.6.. Possession of farm implements and ox, and Labor sufficiency*

#### 3.3.1.6.1 Possession of farm implements

Table 3.3.27 shows the response of household on complete plough set possession, and 77% of the household responded to have complete plough set in the region. Hoe, axe, sickle, and spade are some of the farm implements used by the farmers. Among 12917 household who responded for possessing different implements and machineries (Table 3.3. 28:), 29%, 25%, 24% and 22% of them owned hoe, axe, sickle, and spade, respectively. Tractor and harvester machine were owned by 0.5 and 0.3%, respectively. In line with this, Table 3.3.29 presents the number of implements possessed by different households.

**Table 3.3. 27:** Response of households on complete plough set possession

| No. | Response | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=6576) | Infant town (N=951) | Rural (N=5625) |
| 1 | Yes | 77.4 | 60.8 | 80.2 |
| 2 | No | 22.6 | 39.2 | 19.8 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 28:** Distribution of farm implements possession among households

| No. | Type of implement | Region | | Infant town | | Rural | |
|---|---|---|---|---|---|---|---|
| | | No. HOUSEHOLD | % HOUSEHOLD | No. HOUSEHOLD | % of HOUSEHOLD | No. HOUSEHOLD | % of HOUSEHOLD |
| 1 | Hoe | 3734 | 28.9 | 93 | 7.9 | 3641 | 31.0 |
| 2 | Axe | 3164 | 24.5 | 367 | 31.3 | 2797 | 23.8 |
| 3 | Sickle | 3113 | 24.1 | 365 | 31.1 | 2748 | 23.4 |
| 4 | Spade | 2807 | 21.7 | 327 | 27.9 | 2480 | 21.1 |
| 5 | Tractor | 66 | 0.5 | 12 | 1.0 | 54 | 0.5 |
| 6 | Harvester machine | 33 | 0.3 | 8 | 0.7 | 25 | 0.2 |
| | Total | 12917 | 100.0 | 1172 | 100.0 | 11745 | 100.0 |

**Table 3.3. 29:**Distribution of farm implements possession among households

| No. | Type of implement | Region | | Infant town | | Rural | |
|---|---|---|---|---|---|---|---|
| | | No. HOUSEHOLD | % | No. HOUSEHOLD | % | No. HOUSEHOLD | % |
| 1 | Complete plough set | | | | | | |
| | 1 | 3316 | 70.9 | 353 | 68.8 | 2963 | 71.1 |
| | 2 | 638 | 13.6 | 79 | 15.4 | 559 | 13.4 |
| | 3 | 125 | 2.7 | 13 | 2.5 | 112 | 2.7 |
| | 4 or more | 599 | 12.8 | 68 | 13.3 | 531 | 12.7 |
| | hoe | | | | | | |
| | 1 | 4177 | 96.1 | 507 | 92.7 | 3670 | 96.6 |
| | 2 | 97 | 2.2 | 23 | 4.2 | 74 | 1.9 |
| | 3 | 41 | 0.9 | 8 | 1.5 | 33 | 0.9 |
| | 4 or more | 31 | 0.7 | 9 | 1.6 | 22 | 0.6 |
| 2 | Sickle | | | | | | |
| | 1 | 2765 | 67.4 | 283 | 69.0 | 2482 | 67.2 |
| | 2 | 643 | 15.7 | 61 | 14.9 | 582 | 15.8 |
| | 3 | 392 | 9.6 | 42 | 10.2 | 350 | 9.5 |
| | 4 or more | 304 | 7.4 | 24 | 5.9 | 280 | 7.6 |
| 3 | Spade | | | | | | |
| | 1 | 3965 | 96.5 | 491 | 96.5 | 3474 | 96.5 |
| | 2 | 121 | 2.9 | 15 | 2.9 | 106 | 2.9 |
| | 3 | 13 | 0.3 | 3 | 0.6 | 10 | 0.3 |
| | 4 or more | 9 | 0.2 | | 0.0 | 9 | 0.3 |
| 4 | Triddle pump | | | | | | |
| | 1 | 73 | 91.3 | 11 | 91.7 | 62 | 91.2 |
| | 2 | 7 | 8.8 | 1 | 8.3 | 6 | 8.8 |
| | 3 | 0 | 0.0 | | 0.0 | | 0.0 |
| | 4 or more | 0 | 0.0 | | 0.0 | | 0.0 |
| 5 | drip | | | | | | |
| | 1 | 37 | 80.4 | 6 | 75.0 | 31 | 81.6 |
| | 2 | 9 | 19.6 | 2 | 25.0 | 7 | 18.4 |
| | 3 | 0 | 0.0 | | 0.0 | | 0.0 |
| | 4 or more | 0 | 0.0 | | 0.0 | | 0.0 |
| 6 | Axe | | | | | | |
| | 1 | 10 | 0.3 | 2 | 0.4 | 8 | 0.2 |
| | 2 | 0 | 0.0 | | 0.0 | | 0.0 |
| | 3 | 0 | 0.0 | | 0.0 | | 0.0 |
| | 4 or more | 3931 | 99.7 | 495 | 99.6 | 3436 | 99.8 |

### 3.3.1.6.2 Possession of ox

Almost all subsistence farmers in the Tigray region plough their lands with ox. Table 3.3.30 shows the response of household on the number of ox owned (out of the total number of male

and female households), and 34% of the total household had no ox that could be used for ploughing their land. Among those household who hadn't ox, 17% each were male and females. Among the total household, 28.6% of them had one ox among which 24.4% were male and 4.2% were female household's. The percentages of household with two oxen in the region comprised 33.3% out of which 30.8% were males and 2.5% were female household's. Generally, these results indicate the female household's were with less possession of ox which might force them to rent or share-out their farmlands.

Table 3.3.31 shows the response of households on the means how to plough if they possessed only one or no ox, and 45.7% of the household's plough their farm by sharing ox. Among the households who shared ox, 37% were male and 8.5 were female household's. Renting ox was also another means used to plough farm lands (10% of male and 5% of female household respondents). Others (sharing- or renting-out of farm land, ploughing of land with the agreement giving straw in exchange of plough service etc comprised 35.5% of the response by the households.

**Table 3.3. 30:** Response of households on the number of ox owned (out of the total number of males and females)

| No. | Land size | Response of HOUSEHOLD in % | | | | | |
|---|---|---|---|---|---|---|---|
| | | Region | | Infant towns | | Rural | |
| | | Male (N=4976) | Female (N=1597) | Male (N=693) | Female (N=258) | Male (N=4283) | Female (N=1339) |
| 1 | None | 16.8 | 17.3 | 27.4 | 22.5 | 14.9 | 16.4 |
| 2 | One ox | 24.4 | 4.2 | 16.4 | 2.2 | 25.8 | 4.6 |
| 3 | Two oxen | 30.8 | 2.5 | 24.3 | 1.9 | 31.9 | 2.7 |
| 4 | 3-4 oxen | 3.5 | 0.2 | 4.2 | 0.5 | 3.4 | 0.1 |
| 5 | 5-6 oxen | 0.2 | 0.0 | 0.4 | 0.0 | 0.1 | 0.0 |
| 6 | >6 oxen | 0.1 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 |
| | Total | 75.7 | 24.3 | 72.9 | 27.1 | 76.2 | 23.8 |
| | Total | 100.0 | | 100.0 | | 100.0 | |

**Table 3.3. 31:** Response of households on the means how to plough if only one or none ox owned

| No. | Land size | Response of HOUSEHOLD in % | | | | | |
|---|---|---|---|---|---|---|---|
| | | Region | | Infant towns | | Rural | |
| | | Male (N=2708) | Female (N=1416) | Male (N=417) | Female (N=235) | Male (N=2291) | Female (N=1181) |
| 1 | Renting ox/oxen | 9.7 | 4.8 | 10.9 | 5.7 | 9.4 | 4.6 |
| 2 | Share ox | 37.2 | 8.5 | 24.4 | 4.0 | 39.6 | 9.3 |
| 3 | Pairing with cow, donkey, camel/mule | 3.0 | 0.3 | 1.2 | 0.2 | 3.3 | 0.3 |
| 4 | Using only cow or mule | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 |
| 5 | Digging with labour | 0.5 | 0.4 | 0.2 | 0.2 | 0.6 | 0.5 |
| 6 | Others | 15.2 | 20.3 | 27.3 | 26.1 | 12.9 | 19.2 |
| | | 65.7 | 34.3 | 64.0 | 36.0 | 66.0 | 34.0 |
| | Total | 100.0 | | 100.0 | | 100.0 | |

### 3.3.1.6.3. Labour sufficiency

Family labour and/or hired labour is used for performing various activities in crop production. Table 3.3.32 shows response of household on sufficiency of household size to carry out farm activities. Among the total household surveyed in the region 53% responded to sufficiency of household labour to run their farm activities while 45% responded to insufficiency. It was only 2% of the total household who responded to excess labour they had for farming. Similar trends were also observed for the infant towns and rural households.

Farmers face labour shortages during harvesting and threshing, and weeding. According to the survey result (Table 3.3.33), 18-19% of the household's responded that the aforementioned field activities were critical with regard to labour shortages. In tackling labour shortages, 32% of the household's practiced village cooperation, while 22% and 16% of the household's responded to hiring labour and sought assistance from relatives (Table 3.3. 34:).

**Table 3.3. 32:** Response of households on sufficiency of household size to carry out agricultural activities

| No. | Response | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=4125) | Infant Towns (N=652) | Rural (N=3473) |
| 1 | Sufficient | 52.6 | 65.1 | 50.5 |
| 2 | Insufficient | 45.3 | 33.0 | 47.4 |
| 3 | Excess | 2.1 | 1.9 | 2.1 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 33:** Response of households on the occurrence of labor shortages during major agricultural Activities

| No. | Activity | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=3018) | Infant Towns (N=525) | Rural (N=2493) |
| 1 | Ploughing and sowing | 15.2 | 14.9 | 15.3 |
| 2 | Weeding | 18.3 | 16.2 | 18.7 |
| 3 | Harvesting and threshing | 19.3 | 19.8 | 19.2 |
| 4 | Looking after cattle | 0.6 | 0.0 | 0.8 |
| 5 | Others | 6.0 | 6.5 | 5.9 |
| 6 | 1 & 2 | 1.3 | 1.3 | 1.3 |
| 7 | 1 & 3 | 2.7 | 1.9 | 2.8 |
| 8 | 2 & 3 | 13.6 | 14.7 | 13.4 |
| 9 | 1, 2 & 3 | 19.3 | 22.5 | 18.7 |
| 10 | 2, 3, & 4 | 0.6 | 1.1 | 0.5 |
| 11 | 1, 2, 3 & 4 | 3.0 | 1.1 | 3.4 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 34:** Response of households on how to overcome labour shortage during major activities

| No. | Attempt | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=3057) | Infant Towns (N=528) | Rural (N=2529) |
| 1 | Hiring labour | 22.3 | 39.4 | 18.7 |
| 2 | Village cooperation | 31.7 | 22.2 | 33.7 |
| 3 | Assistance from relatives | 15.9 | 10.2 | 17.1 |
| 4 | Others | 19.3 | 19.9 | 19.2 |
| 5 | 1 & 2 | 3.4 | 4.5 | 3.2 |
| 6 | 1 & 3 | 1.3 | 0.8 | 1.4 |
| 7 | 2 & 3 | 4.7 | 2.1 | 5.3 |
| 8 | 1, 2 & 3 | 1.4 | 0.9 | 1.5 |
| | Total | 100.0 | 100.0 | 100.0 |

### *3.3.1.7 Use of seeds*

Use of high yielding and clean seeds is one of the important inputs to enhance crop productivity. Farmers use either local seeds and/or improved seeds. Among the total household respondents, only 79% used improved seeds, while 21% of the household's responded to using improved seeds (Table 3.3. 35:). The source of local seeds could be cooperatives, government, relatives, or local markets. The major sources of local seeds were from relatives/friends (25% of the respondents) and markets (18% of the respondents) (Table 3.3. 36:).

Regionally, the practice of using improved seeds was low. When regarded by crop type, improved seeds of tef (67%) and wheat (60%) were the ones which most of the farmers use (Table 3.3.37). Maize was also the third in the rank (15% of the respondents). On average, 60 kg of improved wheat seeds was used by 558 householders, and 18.1 kg of improved tef seeds was used by 438 householders (

Table 3.3. 38:). About 79% of the householders of who responded of not using improved seeds said higher seed price constrained them for not using improved seeds while 8% of respondents attributed to non-availability of improved seeds (Table 3.3. 39:).

**Table 3.3. 35:** Response of households on use of improved seeds

| No. | Response | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=6484) | Infant Towns (N=1012) | Rural (N=5472) |
| 1 | Yes | 20.6 | 18.0 | 21.1 |
| 2 | No | 79.4 | 82.0 | 78.9 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 36:** Response of households on source of local seeds

| No. | Source | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=5624) | Infant Towns (N=782) | Rural (N=4842) |
| 1 | Cooperative | 6.7 | 4.7 | 7.1 |
| 2 | Gov't | 4.6 | 4.0 | 4.6 |
| 3 | NGO's | 0.2 | 0.1 | 0.2 |
| 4 | Relatives/friends | 25.4 | 30.7 | 24.5 |
| 5 | Local market | 18.1 | 20.2 | 17.8 |
| 6 | Others | 18.6 | 20.6 | 18.3 |
| 7 | 4 & 5 | 25.4 | 18.5 | 26.5 |
| 8 | 1 & 2 | 1.0 | 1.2 | 1.0 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 37:** Response of house holders on use of improved seeds

| Crop type | No. of HOUSEHOLD | | | |
|---|---|---|---|---|
| | Yes | No | Total | % - Yes |
| **Cereals** | | | | |
| Teff | 439 | 1320 | 1759 | 25.0 |
| Barley | 82 | 703 | 785 | 10.4 |
| Wheat | 558 | 380 | 938 | 59.5 |
| Kerkaeta | 6 | 53 | 59 | 10.2 |
| Maize | 101 | 564 | 665 | 15.2 |
| Sorghum | 79 | 970 | 1049 | 7.5 |
| Lequa | 2 | 36 | 38 | 5.3 |
| Finger millet | 11 | 97 | 108 | 10.2 |
| **Pulses** | | | | |
| Faba bean | 3 | 27 | 30 | 10.0 |
| Pulses | 5 | 42 | 47 | 10.6 |
| Ground nut | 0 | 5 | 5 | 0.0 |
| Lentils | 1 | 19 | 20 | 5.0 |
| **Oil crops** | | | | |
| Sesame | 23 | 82 | 105 | 21.9 |
| Linseed | 0 | 2 | 2 | 0.0 |
| **Vegetables** | | | | |
| Vegetables Potatoes | 1 | 3 | 4 | 25.0 |
| Onion | 1 | 4 | 5 | 20.0 |

**Table 3.3. 38:** Response of house holders on amount of improved seeds (kg) used

| Crop type | No. of HOUSEHOLD | | | |
|---|---|---|---|---|
| | Mean | Obs | SD | Ranges |
| **Cereals** | | | | |
| Tef | 18.1 | 438 | 25.2 | 0.5-408 |
| Barley | 39.2 | 82 | 23.0 | 2-100 |
| Wheat | 59.5 | 558 | 148.9 | 1-3000 |
| Kerkaeta | 25.3 | 6 | 15.2 | 2-50 |
| Maize | 14.2 | 100 | 25.2 | 1-200 |
| Sorghum | 15.8 | 78 | 12.6 | 1-50 |
| Lequa | 7.5 | 2 | 3.5 | 5-10 |
| Finger millet | 12.8 | 10 | 7.1 | 2-25 |
| **Pulses** | | | | |
| Faba bean | 23 | 3 | 23.5 | 7-50 |
| Pulses | 39 | 5 | 11.4 | 25-50 |
| **Oil crops** | | | | |
| Sesame | 18.1 | 23 | 21.6 | 2-100 |
| **Vegetables** | | | | |

| | | | | |
|---|---|---|---|---|
| Vegetables | 14.5 | 20 | 14.0 | 1-60 |

**Table 3.3. 39:** Reason for not using improved seeds

| No. | Reason | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=4545) | Infant Towns (N=634) | Rural (N=3911) |
| 1 | Expensive | 40.2 | 34.2 | 41.2 |
| 2 | Not available | 34.2 | 35.2 | 34.1 |
| 3 | No significant difference in the yields from that of the local seeds | 7.9 | 8.0 | 7.9 |
| 4 | Lack of knowledge | 4.2 | 6.5 | 3.9 |
| 5 | Susceptible to pests and diseases | 2.7 | 3.9 | 2.5 |
| 6 | Intolerance to water stress | 3.3 | 2.1 | 3.5 |
| 7 | Lower straw productivity | 4.4 | 5.5 | 4.2 |
| 8 | Lower palatability | 1.1 | 2.1 | 0.9 |
| 9 | Others | 2.0 | 2.5 | 1.9 |
| | Total | 100.0 | 100.0 | 100.0 |

### *3.3.1.8. Soil fertility management*

Low soil fertility is among the major constraints in Tigray region that reduce crop productivity. Poor soil fertility is attributed to the overall land degradation. Most soils in the region have been highly degraded because of long years' of continuous cultivation, poor soil fertility management, deforestation, soil erosion, improper land use systems etc. As a means of maintaining or improving soil fertility 24% of the householders responded to applying commercial fertilizers while 20 % of the householders said they applied both commercial and manure for improving soil fertility (Table 3.3. 40:). Availability of commercial fertilizers had not been a constraint (95% of the householder respondents) (Table 3.3. 41:). It is, however, noted that 79-89% of the respondents used less than 50 kg of Urea, DAP and other type of fertilizers (Table 3.3. 42:). This seems quite a low amount of fertilizer consumption to improve soil fertility and thereby enhance crop productivity. About 37% of the respondents whom didn't use chemical fertilizer said that increased price was the limitation while 34% of the respondents indicated shortages of rainfall and sufficient soil fertility were the reasons of not using chemical fertilizers (Table 3.3. 44:). Surprisingly 12.4% of the householders who didn't use fertilizer believed that applying commercial fertilizer was not useful.

These days fertilizer recommendation was based on the nutrient status of the soil (ATA, 2014). Therefore, various fertilizer blends have been formulated for applications in accordance to different soil types. Even though the rates of fertilizer should vary based on the nutrient status, 200 kg per ha was mostly recommended. Looking at the results presented on Table 3.3.43, however, 41% of the respondents consumed 51-100 kg of Urea and DAP each per ha, while another 40% of the respondents consumed below 50 kg of Urea and DAP each per ha.

In addition to applying fertilizer, intercropping, crop rotation and fallowing contributes in improving soil fertility. About 88% of the householders practiced crop rotation (Table 3.3. 45:), but intercropping was practiced by 77% of the householders (Table 3.3. 46:). Fallowing was practiced by 35% of the householders (Table 3.3. 47:). About 90% of the householders who didn't fallow said that shortage of farmland was the reason that limited them for not fallowing (Table 3.3. 48:).

**Table 3.3. 40:** Response of households on measures taken to maintain soil fertility

| No. | Measures taken | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=6229) | Infant Towns (N=913) | Rural (N=5316) |
| 1 | Apply manure | 5.2 | 6.0 | 5.0 |
| 2 | Apply commercial fertilizer | 24.4 | 26.5 | 24.0 |
| 3 | Practice terracing | 4.1 | 8.1 | 3.4 |
| 4 | Crop residue use | 0.3 | 0.7 | 0.2 |
| 5 | Plant trees and/or grass | 0.2 | 0.3 | 0.1 |
| 6 | Others | 10.5 | 18.5 | 9.1 |
| 7 | 1 & 2 | 19.8 | 14.3 | 20.7 |
| 8 | 1 & 3 | 1.8 | 1.1 | 2.0 |
| 9 | 2 & 3 | 8.2 | 7.3 | 8.3 |
| 10 | 3 & 4 | 0.4 | 0.5 | 0.4 |
| 11 | 1, 2 & 3 | 23.8 | 14.7 | 25.3 |
| 12 | 1, 3 & 4 | 0.3 | 0.1 | 0.3 |
| 13 | 2, 3 & 4 | 1.1 | 1.8 | 1.0 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 41:** Response of households on availability of chemical fertilizers on time

| | | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| No. | Response | Region (N=5127) | Infant Towns (N=623) | Rural (N=4504) |
| 1 | Available | 94.5 | 96.1 | 94.3 |
| 2 | Not available | 5.5 | 3.9 | 5.7 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 42:** Response of householder to the total use of fertilizers

| No | Total fertilizer used (kg) | Response of HOUSEHOLD in % | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Urea | | | DAP | | | Others | | |
| | | Region (N=4725) | Infant Towns (N=558) | Rural (N=4167) | Region (N=4873) | Infant Towns (N=586) | Rural (N=4287) | Region (N=202) | Infant Towns (N=18) | Rural (N=184) |
| 1 | <50 | 89.1 | 87.8 | 89.2 | 85.1 | 79.4 | 85.9 | 79.2 | 72.2 | 79.9 |
| 2 | 51-100 | 9.2 | 9.1 | 9.2 | 12.1 | 15.9 | 11.5 | 9.4 | 5.6 | 9.8 |
| 3 | 101-150 | 1.2 | 1.8 | 1.1 | 1.7 | 2.4 | 1.6 | 1.0 | 0.0 | 1.1 |
| 4 | 151-200 | 0.3 | 0.7 | 0.2 | 0.6 | 1.0 | 0.5 | 2.5 | 0.0 | 2.7 |
| 5 | 201-300 | 0.2 | 0.0 | 0.2 | 0.4 | 0.7 | 0.3 | 0.5 | 5.6 | 0.0 |
| 6 | 301-400 | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 | 0.0 | 1.0 | 5.6 | 0.5 |
| 7 | 401-600 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.0 | 0.5 |
| 8 | >600 | 0.1 | 0.5 | 0.0 | 0.1 | 0.5 | 0.1 | 5.9 | 11.1 | 5.4 |
| | Total | 100.0 | 100.0 | 100 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Table 3.3. 43:** Response of householder to the consumption of different rates fertilizer

| No | Rate of fertilizer consumed (kg/ha) | Response of HOUSEHOLD in % | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Urea | | | DAP | | | Others | | |
| | | Region (N=4302) | Infant Towns (N=501) | Rural (N=3801) | Region (N=4436) | Infant Towns (N=528) | Rural (N=3908) | Region (N=190) | Infant Towns (N=17) | Rural (N=173) |
| 1 | <50 | 39.7 | 37.5 | 39.9 | 36.9 | 31.6 | 37.6 | 69.5 | 58.8 | 70.5 |
| 2 | 51-100 | 41.0 | 41.9 | 40.9 | 41.1 | 42.8 | 40.9 | 10.0 | 11.8 | 9.8 |
| 3 | 101-150 | 4.6 | 3.4 | 4.8 | 5.6 | 5.5 | 5.6 | 3.2 | 11.8 | 2.3 |
| 4 | 151-200 | 10.9 | 12.2 | 10.8 | 11.7 | 12.7 | 11.6 | 5.3 | 0.0 | 5.8 |
| 5 | >200 | 3.8 | 5.0 | 3.7 | 4.7 | 7.4 | 4.3 | 12.1 | 17.6 | 11.6 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Table 3.3. 44:** Response of households on reason for not using chemical fertilizer

| No. | Response | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=3470) | Infant Towns (N=625) | Rural (N=2845) |
| 1 | It is not useful | 12.4 | 11.0 | 12.7 |
| 2 | Expensive | 36.8 | 30.2 | 38.2 |
| 3 | Shortage of money | 6.2 | 7.8 | 5.8 |
| 4 | Not available | 0.9 | 1.4 | 0.7 |
| 5 | No credit service | 0.7 | 0.3 | 0.8 |
| 6 | No significant difference in production | 3.5 | 5.6 | 3.1 |
| 7 | Fear of drought | 5.2 | 7.2 | 4.8 |
| 8 | Others | 34.4 | 36.3 | 33.9 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 45:** Response of households on practice of crop rotation

| No. | Response | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=5784) | Infant Towns (N=810) | Rural (N=4974) |
| 1 | Yes | 87.6 | 89.3 | 87.3 |
| 2 | No | 12.4 | 10.7 | 12.7 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 46:** Response of households on using intercropping

| No. | Response | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=5784) | Infant Towns (N=810) | Rural (N=4974) |
| 1 | Yes | 23.0 | 19.8 | 23.5 |
| 2 | No | 77.0 | 80.2 | 76.5 |
| | Total | 100.0 | 100 | 100 |

**Table 3.3. 47:** Response of households on practice of fallow system

| No. | Response | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=5784) | Infant Towns (N=810) | Rural (N=4974) |
| 1 | Yes | 34.8 | 36.0 | 34.5 |
| 2 | No | 65.2 | 64.0 | 65.5 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 48:** Distribution of households by reason for not practicing fallow system

| No. | Response | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=3774) | Infant Towns (N=518) | Rural (N=3256) |
| 1 | Shortage of farm lands | 90.8 | 84.9 | 91.7 |
| 2 | Encouraged by increased crop prices | 1.2 | 0.8 | 1.3 |
| 3 | Lack of knowledge | 5.0 | 8.7 | 4.4 |
| 4 | Others | 3.0 | 5.6 | 2.6 |
| | Total | 100.0 | 100.0 | 100.0 |

### 3.3.1.9. Pests and diseases and their management

The potential crop yield couldn't be attained because of various limitations. Late onset and early cessation of rainfall, less amount of rainfall, water logging, crop damage by rodents, insect pests and diseases, hail, flood, and frost are among the limitations. About 51% of the respondents complained of water stress due to less amount of rainfall, while 18% indicated late onset and early cessation of rainfall as constraints in crop production (Table 3.3. 49:). When analyzed within the pests and diseases category, 66% of the respondents said insects were the major causes of crop loss. Another 13 % of the respondents mentioned weeds to be the main constraints and while 12% of the respondents attributed the losses to diseases. Use of chemicals for the control of pests and diseases in the crop field was generally low in the region. Most of the respondents (23-32%) mentioned that higher price had been the main limitation for not using chemicals (Table 3.3. 50:). Another 19-22% of the respondents also said that lack of knowledge in the importance and availability of chemicals limited them not to use chemicals.

**Table 3.3. 49:** Response of households to causes of crop loss

| No. | Causes of crop loss | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=3898) | Infant Towns (N=534) | Rural (N=3364) |
| 1 | Late onset & early cessation of rainfall | 31.9 | 26.8 | 32.7 |
| 2 | Less amount of rainfall | 42.1 | 44.6 | 41.8 |
| 3 | Excess rainfall (water logging) | 2.1 | 3.2 | 1.9 |
| 4 | Weeds | 2.6 | 5.1 | 2.2 |
| 5 | Insect pests | 9.9 | 10.5 | 9.8 |
| 6 | Diseases | 1.5 | 1.3 | 1.5 |
| 7 | Rodents | 0.5 | 0.6 | 0.5 |
| 8 | Hail | 6.6 | 5.2 | 6.8 |
| 9 | Flood | 0.8 | 0.7 | 0.8 |
| 10 | Frost | 0.6 | 0.4 | 0.7 |
| 11 | Termites | 0.5 | 0.7 | 0.5 |
| 12 | Others | 1.0 | 0.9 | 1.0 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 50:** Response of households on reasons for not using chemicals against weeds, pests and crop diseases

| | Response | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| Weeds | | Region (N=2762) | Infant Towns (N=426) | Rural (N=2336) |
| | Lack of knowledge | 18.6 | 13.6 | 19.5 |
| | Expensive | 32.1 | 31.5 | 32.2 |
| | Shortage of money | 9.7 | 8.7 | 9.9 |
| | Not Available | 6.8 | 5.9 | 7.0 |
| | No credit services | 0.6 | 0.5 | 0.6 |
| | Suspect its effectiveness | 6.4 | 8.2 | 6.1 |
| | Fears of drought occurrence | 4.5 | 4.9 | 4.5 |
| | Others | 21.3 | 26.8 | 20.2 |
| | Total | 100.0 | 100.0 | 100.0 |
| Insect Pests | | Region (N=1107) | Infant Towns (N=109) | Rural (N=998) |
| | Lack of knowledge | 18.1 | 19.3 | 17.9 |
| | Expensive | 22.9 | 16.5 | 23.5 |
| | Shortage of money | 8.5 | 8.3 | 8.5 |
| | Not Available | 9.0 | 8.3 | 9.1 |
| | No credit services | 1.4 | 1.8 | 1.3 |
| | Suspect its effectiveness | 6.6 | 9.2 | 6.3 |
| | Fears of drought occurrence | 7.3 | 4.6 | 7.6 |
| | Others | 26.3 | 32.1 | 25.7 |

| | | | | |
|---|---|---|---|---|
| | Total | 100.0 | 100.0 | 100.0 |
| Crop diseases | | Region (N=3898) | Infant Towns (N=534) | Rural (N=3364) |
| | Lack of knowledge | 22.0 | 18.0 | 22.7 |
| | Expensive | 24.9 | 19.1 | 25.8 |
| | Shortage of money | 9.3 | 9.0 | 9.3 |
| | Not Available | 13.8 | 16.7 | 13.3 |
| | No credit services | 1.3 | 1.1 | 1.4 |
| | Suspect its effectiveness | 6.0 | 7.5 | 5.8 |
| | Fears of drought occurrence | 4.6 | 4.9 | 4.5 |
| | Others | 18.2 | 23.8 | 17.3 |
| | Total | 100.0 | 100.0 | 100.0 |

### *3.3.1.10. Frequency of crop harvest and food sufficiency*

Annual crops are produced based on rainfall as source of water. The main rainy season spanned between June and September. About 97% of the householders produced crops only once in the year while 2.9% of the respondents produced twice per year (Table 3.3. 51:). With regard to sufficiency of food within a year, 66% of the householders responded to having difficulty in having enough food for a year (Table 3.3. 52:). Among the householders who had shortages of food for a year, 56% of them faced shortages for over six months, 24 % had shortages for 4-5 months, and 16% had shortages for 2-3 months (Table 3.3. 53:). When asked how to manage food shortages until the next harvest, about 20% of the house holders responded o selling of animals, while another 17% said that they received aid (Table 3.3. 54:). Relatives also assisted if there are problems of food shortages (9% of the respondents).

**Table 3.3. 51:** Households response on frequency of harvest

| No. | Frequency | No. of households | % | |
|---|---|---|---|---|
| | | Region (N=6576) | Infant Towns (N=951) | Rural (N=5625) |
| 1 | Once | 96.9 | 97.0 | 96.9 |
| 2 | Twice | 2.9 | 2.7 | 3.0 |
| 3 | Three times | 0.1 | 0.3 | 0.1 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 52:** Households response on sufficiency of food until next harvest

| No. | Response | No. of households | % | |
|---|---|---|---|---|
| | | Region (N=6576) | Infant Towns (N=951) | Rural (N=5625) |
| 1 | Yes | 33.9 | 42.3 | 32.5 |
| 2 | No | 66.1 | 57.7 | 67.5 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 53:** Response of households on period of food sufficiency

| No. | Period (months) | No. of households % | | |
|---|---|---|---|---|
| | | Region (N=4269) | Infant Towns (N=522) | Rural (N=3747) |
| 1 | One month | 3.1 | 4.0 | 2.9 |
| 2 | Two months | 7.9 | 12.6 | 7.3 |
| 3 | Three months | 8.3 | 10.5 | 8.0 |
| 4 | Four to five months | 24.5 | 24.3 | 24.5 |
| 5 | Six months or more | 56.2 | 48.5 | 57.3 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 54:** Households response on how to manage food shortage until next harvest

| No. | Means of management | No. of households % | | |
|---|---|---|---|---|
| | | Region (N=3921) | Infant Towns (N=498) | Rural (N=3423) |
| 1 | Assistance from relatives | 9.3 | 13.9 | 8.7 |
| 2 | Borrowing | 3.4 | 4.8 | 3.2 |
| 3 | Sell of animals | 19.5 | 12.7 | 20.5 |
| 4 | Aid | 16.9 | 16.1 | 17.1 |
| 5 | Others | 14.4 | 25.1 | 12.9 |
| 6 | 1 & 4 | 7.3 | 9.2 | 7.0 |
| 7 | 2 & 4 | 3.7 | 2.4 | 3.9 |
| 8 | 3 & 4 | 9.9 | 4.6 | 10.7 |
| 9 | 1 & 3 | 5.6 | 4.8 | 5.8 |
| 10 | 2 & 3 | 2.7 | 2.8 | 2.7 |
| 11 | 1 & 2 | 2.2 | 2.6 | 2.2 |
| 12 | 1, 3 & 4 | 3.1 | 0.8 | 3.4 |
| 13 | 2, 3 & 4 | 1.9 | 0.2 | 2.1 |
| | Total | 100.0 | 100.0 | 100.0 |

### *3.3.1.11. Post-harvest management*

After crop harvest, grain is stored in different storage structures. Plastic bag (=Tirinshwa) is the main material (50% of respondents) used for storing grain (Table 3.3. 55:). This is followed by Godo (27% of respondents) and sisal bags (12.2% of the respondents). About 34% of the householders stored their harvest for 6-8 months, while another 28% of the respondents stored their grain for over 8 months, and another 28% of the respondents for 3-5 months (Table 3.3. 56:). During storage, grain is affected by different biological agents (fungus, weevils, rodents etc). Over 65% of the householders responded to no losses in all crops during grain storage. However, losses up to 10% were commonly responded for wheat, barley, maize, sorghum and pulses (Table 3.3.57). About 39% of the householders indicated weevils as major causes of post-harvest losses while another 37% of the respondents said it was rodents which caused major

losses (Table 3.3. 58:). Termites and lack of care were also other causes of losses even though the percentages of respondents were low (4-5%).

As post-harvest grain management practices, about 23 % of the respondents used traditional and/or chemicals to control the causes of losses (Table 3.3. 59: and Table 3.3. 60:). About 7 % of the respondents use ash as traditional control means. With regard to chemical control measures, 12% of the respondents used insecticides in form of dusts while 4% use fumigants.

**Table 3.3. 55:** What storage structure does the household use

| No. | Storage structure | No. of households % | | |
|---|---|---|---|---|
| | | Region (N=4700) | Infant Towns (N=641) | Rural (N=4059) |
| 1 | Plastic bag | 50.0 | 57.1 | 48.9 |
| 2 | Aibet | 1.4 | 0.9 | 1.5 |
| 3 | Sisal bag | 12.2 | 16.2 | 11.6 |
| 4 | Godo | 26.7 | 16.1 | 28.4 |
| 5 | Shirfa | 2.8 | 1.7 | 3.0 |
| 6 | Wala | 0.5 | 1.2 | 0.4 |
| 7 | Maeken | 1.3 | 1.1 | 1.4 |
| 8 | Pit | 0.6 | 0.0 | 0.6 |
| 9 | Pot | 0.0 | 0.2 | 0.0 |
| 10 | Others | 4.4 | 5.5 | 4.2 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 56:** For how long does the household stored harvested crop

| No. | Control measures | No. of households % | | |
|---|---|---|---|---|
| | | Region (N=4621) | Infant Towns (N=623) | Rural (N=3998) |
| 1 | One month | 4.2 | 6.1 | 4.0 |
| 2 | Two months | 6.9 | 9.0 | 6.5 |
| 3 | 3-5 months | 27.7 | 24.1 | 28.2 |
| 4 | 6-8 months | 33.6 | 31.5 | 33.9 |
| 5 | >8 months | 27.6 | 29.4 | 27.3 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 57:** Post-harvest crop losses by crop type

| No | Crop type | Crop loss (%) | No. of HOUSEHOLD | % |
|---|---|---|---|---|
| **I** | **Cereals** | | | |
| | Tef | | | |
| | | 0 | 1008 | 77.9 |
| | | >0-10 | 203 | 15.7 |
| | | 11-25 | 53 | 4.1 |
| | | 26-50 | 18 | 1.4 |
| | | 51-75 | 2 | 0.2 |
| | | 76-100 | 10 | 0.8 |
| | | Total | 1294 | 100.0 |
| | Wheat | | | |
| | | 0 | 391 | 73.9 |
| | | >0-10 | 106 | 20.0 |
| | | 11-25 | 18 | 3.4 |
| | | 26-50 | 7 | 1.3 |
| | | 51-75 | | |
| | | 76-100 | 7 | 1.3 |
| | | Total | 529 | 100.0 |
| | Barley | | | |
| | | 0 | 425 | 79.3 |
| | | >0-10 | 84 | 15.7 |
| | | 11-25 | 19 | 3.5 |
| | | 26-50 | 3 | 0.6 |
| | | 51-75 | 1 | 0.2 |
| | | 76-100 | 4 | 0.8 |
| | | Total | 536 | 100.0 |
| | Kerkaeta | | | |
| | | 0 | 28 | 71.8 |
| | | >0-10 | 6 | 15.4 |
| | | 11-25 | 3 | 7.7 |
| | | 26-50 | 1 | 2.6 |
| | | 51-75 | 1 | 2.6 |
| | | 76-100 | | |
| | | Total | 39 | 100.0 |
| | Sorghum | | | |
| | | 0 | 521 | 66.5 |
| | | >0-10 | 153 | 19.5 |
| | | 11-25 | 81 | 10.3 |
| | | 26-50 | 23 | 2.9 |
| | | 51-75 | 1 | 0.1 |
| | | 76-100 | 5 | 0.6 |
| | | Total | 784 | 100.0 |
| | Maize | | | |
| | | 0 | 213 | 65.7 |
| | | >0-10 | 69 | 21.3 |
| | | 11-25 | 27 | 8.3 |
| | | 26-50 | 12 | 3.7 |
| | | 51-75 | | |

| No | Crop type | Crop loss (%) | No. of HOUSEHOLD | % |
|---|---|---|---|---|
| | | 76-100 | 3 | 0.9 |
| | | Total | 324 | 100.0 |
| | Lequa | | | |
| | | 0 | 14 | 93.3 |
| | | >0-10 | | |
| | | 11-25 | 1 | 6.7 |
| | | 26-50 | | |
| | | 51-75 | | |
| | | 76-100 | | |
| | | Total | | 100.0 |
| | Finger millet | | | |
| | | 0 | 12 | 92.3 |
| | | >0-10 | 1 | 7.7 |
| | | 11-25 | | |
| | | 26-50 | | |
| | | 51-75 | | |
| | | 76-100 | | |
| | | Total | | 100.0 |
| **II** | **Pulses** | | | |
| | Faba bean | | | |
| | | 0 | 8 | 72.7 |
| | | >0-10 | 3 | 27.3 |
| | | 11-25 | | |
| | | 26-50 | | |
| | | 51-75 | | |
| | | 76-100 | | |
| | | Total | 11 | 100.0 |
| | Pulses | | | |
| | | 0 | 19 | 97.9 |
| | | >0-10 | 6 | 21.4 |
| | | 11-25 | 1 | 3.6 |
| | | 26-50 | 2 | 7.1 |
| | | 51-75 | | |
| | | 76-100 | | |
| | | Total | | 100.0 |
| | Lentils | | | |
| | | 0 | 10 | 83.3 |
| | | >0-10 | 2 | 16.7 |
| | | 11-25 | | |
| | | 26-50 | | |
| | | 51-75 | | |
| | | 76-100 | | |
| | | Total | | 100.0 |
| **III** | **Oil crops** | | | |
| | Sesame | | | |
| | | 0 | 35 | 92.1 |
| | | >0-10 | 3 | 7.9 |
| | Linseed | | | 100.0 |

| No | Crop type | Crop loss (%) | No. of HOUSEHOLD | % |
|---|---|---|---|---|
| | | 0 | 1 | 50.0 |
| | | >0-10 | | |
| | | 11-25 | 1 | 50 |
| | | Total | 2 | 100.0 |

**Table 3.3. 58:** Causes of crop post-harvest losses

| No. | Causes of losses | No. of households % | | |
|---|---|---|---|---|
| | | Region (N=437) | Infant Towns (N=68) | Rural (N=369) |
| 1 | Fungus | 1.1 | 0.0 | 1.4 |
| 2 | Weevil | 38.7 | 57.4 | 35.2 |
| 3 | Rodents | 36.8 | 26.5 | 38.8 |
| 4 | Theft | 1.8 | 0.0 | 2.2 |
| 5 | Termites | 4.1 | 1.5 | 4.6 |
| 6 | Lack of care | 5.3 | 5.9 | 5.1 |
| 7 | Others | 2.7 | 4.4 | 2.4 |
| 8 | 2 & 3 | 5.7 | 1.5 | 6.5 |
| 9 | 3 & 5 | 3.7 | 2.9 | 3.8 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 59:** Type of post-harvest traditional control measures

| No. | Control measures | No. of households % | | |
|---|---|---|---|---|
| | | Region (N=1610) | Infant Towns (N=305) | Rural (N=1305) |
| 1 | Ash | 7.1 | 6.9 | 7.1 |
| 2 | Botanicals | 3.5 | 1.6 | 3.9 |
| 3 | Don’t use | 77.2 | 79.0 | 76.8 |
| 4 | Others | 12.2 | 12.5 | 12.2 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 60:** Type of post-harvest chemical control measures

| No. | Control measures | No. of households % | | |
|---|---|---|---|---|
| | | Region (N=3090) | Infant Towns (N=426) | Rural (N=2664) |
| 1 | Dust (e.g., actellic) | 12.0 | 11.7 | 12.0 |
| 2 | Fumigant (tablet) | 3.7 | 5.9 | 3.3 |
| 3 | Don’t use | 76.9 | 73.5 | 77.4 |
| 4 | Others | 7.4 | 8.9 | 7.2 |
| | Total | 100.0 | 100.0 | 100.0 |

### *3.3.1.12. Environmental degradation and Natural Resources Management*

#### 3.3.1.12.1. Environmental degradation

The summer season is the main cropping period where most of the annual crop production is harvested. However, most devastating Ethiopian droughts are associated with failure of summer rains (Segele and Lamb, 2005). Droughts due to insufficient and/or poor distribution of rainfall are a common incidence. About 63% of the householders indicated the occurrence of drought in the last five years (Table 3.3. 61:). According to the majority of the respondents, drought occurred once every five years (42% of respondents) or twice every five years (34% of the respondents) (Table 3.3. 62:). About 24 % of the respondents also mentioned occurrence of drought once every almost two years. When drought occurred, 58% of the householders responded to receiving help from different institutions and individuals (Table 3.3. 63:). Governmental institutions took the lion's share (86% of the respondents) in offering aid to people who were in need of it during drought while relatives shared 2% (Table 3.3. 64:).

When the different householders were asked about the cause of drought, 42% of them indicated the curse of God, while 13% of the respondents attributed to environmental degradation (Table 3.3. 65:). The view of the respondents towards overpopulation and environmental degradation was very low. When suggesting in overcoming drought, 38% of the respondents said praying to God as the main solution, while 18% said environmental protection was the main solution (Table 3.3. 66:). When asked whether drought could occur in the future, 73% of the respondents said God knows (Table 3.3. 67:).

**Table 3.3. 61:** Response to whether households had been affected by drought in the last five years

| No. | Response | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=8145) | Infant Towns (N=1687) | Rural (N=6458) |
| 1 | Yes | 63.3 | 47.1 | 67.6 |
| 2 | No | 36.7 | 52.9 | 32.4 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 62:** Number of times of drought occurrence in the last five years

| No. | Response | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=5159) | Infant Towns (N=794) | Rural (N=4365) |
| 1 | Once | 41.6 | 44.6 | 41.1 |
| 2 | Twice | 33.8 | 34.6 | 33.6 |
| 3 | More than twice | 24.0 | 20.2 | 24.7 |
| 4 | It didn't occur | 0.6 | 0.6 | 0.5 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 63:** Response to whether households got help during the drought period

| No. | Response | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=5152) | Infant Towns (N=793) | Rural (N=4359) |
| 1 | Yes | 57.5 | 50.3 | 58.8 |
| 2 | No | 42.5 | 49.7 | 41.2 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 64:** Distribution of donors

| No. | Response | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=2957) | Infant Towns (N=399) | Rural (N=2558) |
| 1 | Government | 85.5 | 86.5 | 85.3 |
| 2 | NGOs | 0.6 | 1.0 | 0.6 |
| 3 | Relatives | 2.0 | 2.0 | 2.0 |
| 4 | Others | 0.6 | 1.0 | 0.5 |
| 5 | 1 & 3 | 6.2 | 4.0 | 6.6 |
| 6 | 2 & 3 | 0.3 | 0.5 | 0.2 |
| 7 | 1 & 2 | 2.5 | 3.0 | 2.4 |
| 8 | 1, 2 & 3 | 2.4 | 2.0 | 2.4 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 65:** Response about causes of famine

| No. | Response | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=3787) | Infant Towns (N=584) | Rural (N=3203) |
| 1 | Curse of God | 49.2 | 56.8 | 47.8 |
| 2 | Environmental degradation | 12.8 | 12.2 | 12.9 |
| 3 | Over population | 1.8 | 1.9 | 1.8 |
| 4 | Others | 2.7 | 2.9 | 2.7 |
| 5 | 1 &3 | 1.0 | 1.2 | 0.9 |
| 6 | 2 & 3 | 3.6 | 4.8 | 3.4 |
| 7 | 1 & 2 | 22.1 | 16.6 | 23.1 |
| 8 | 1, 2 & 3 | 6.7 | 3.6 | 7.3 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 66:** Distribution of households to suggestions in overcoming drought

| No. | Response | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=5128) | Infant Towns (N=788) | Rural (N=4340) |
| 1 | Pray to God | 38.2 | 41.5 | 37.6 |
| 2 | Environmental (forest, water, land etc) protection | 17.6 | 17.4 | 17.6 |
| 3 | Reduce population growth | 1.0 | 1.5 | 0.9 |
| 4 | Others | 0.7 | 1.3 | 0.6 |
| 5 | 1 & 3 | 1.1 | 1.1 | 1.1 |
| 6 | 2 & 3 | 2.6 | 4.1 | 2.3 |
| 7 | 1 & 2 | 32.3 | 27.9 | 33.0 |
| 8 | 1, 2 & 3 | 6.6 | 5.2 | 6.8 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 67:** Response of households to continuation of drought in the future

| No. | Response | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=8143) | Infant Towns (N=1686) | Rural (N=6457) |
| 1 | Yes | 5.2 | 3.7 | 5.6 |
| 2 | No | 8.5 | 9.1 | 8.3 |
| 3 | God knows | 73.1 | 71.9 | 73.3 |
| 4 | I don't know | 13.3 | 15.2 | 12.8 |
| | Total | 100.0 | 100.0 | 100.0 |

### 3.3.1.12.2 Natural Resources management

Land, water, vegetation and air are among the natural resources which should be properly utilized. Soil and water conservation have been practiced in the region since long years ago in effect of land was rehabilitated amazingly.

Terracing is done in the crop fields to conserve soil and moisture, and shape the fields. When farmers were asked whether they terrace their fields, about 72% responded to yes, while 27% said no (Table 3.3. 68:). The reason why they didn't terrace were because their farmland was plain (37% of the respondents), it was laborious (16% of the respondents) and insufficiency of farmland (17% of the respondents) (Table 3.3. 69:).

Every year seedlings of different tree types were raised by government, community or NGO's nursery for planting in areas which are required for conserving soil and water, and for beautification. Table 3.3.70 shows the response of households on source of seedlings for plantation, and 23% of the householders responded that the source of seedlings were government, while 27% of the household said community nursery. When the households were asked if they would plant more seedlings, 46% of them said yes but the remaining responded no

(Table 3.3. 71:). Table 3.3.72 shows the distribution of the required number of seedling to plant more, and 69% of the household responded to planting 11-100 seedlings, while 17% of the household responded to 101-500 seedlings. When asked for the reasons why not wanting to plant more seedlings, 20% of the household responded to shortage of land while 6% responded to shortage of water (Table 3.3. 73:). In line with this, it was also asked where to get trees that could be used for construction purposes, and 38% of the household said from the market, while another 24% and 7% of the household responded respectively own plantation and community forest as sources (Table 3.3. 74:).

Table 3.3.75 shows the response of household to participation in different development programs, and 35% of the household indicated their participation in terracing, while another 6% of the household said that they participated in construction of dams. When asked whether the different development programs were useful or not to the community, 86% of the household responded that the programs were useful and the remaining household said they were not useful (Table 3.3. 76:). Various development programs indicated in Table 3.3.70 were organized by the government (67% of the respondents), community (9% of the respondents and by both the government and the community (15% of the respondents) (Table 3.3. 77:).

**Table 3.3. 68:** Response of households on practice of terracing on own farm

| No. | Response | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=6576) | Infant Towns (N=951) | Rural (N=5625) |
| 1 | Yes | 71.5 | 65.7 | 72.5 |
| 2 | No | 28.5 | 34.3 | 27.5 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 69:**Distribution of households by reason for not practicing terracing on own farm

| No. | Reason | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=1801) | Infant Towns (N=316) | Rural (N=1485) |
| 1 | Laborious | 15.9 | 15.8 | 15.9 |
| 2 | Hide out crop damaging rodents | 2.2 | 2.2 | 2.2 |
| 3 | Insufficiency of farmland | 17.1 | 13.6 | 17.8 |
| 4 | The farmland is plain | 36.6 | 43.7 | 35.1 |
| 5 | Others | 16.2 | 17.4 | 15.9 |
| 6 | 1 & 4 | 1.6 | 2.2 | 1.5 |
| 7 | 3 & 4 | 4.0 | 1.9 | 4.4 |
| 8 | 1 & 3 | 2.1 | 1.6 | 2.2 |
| 9 | 2 & 3 | 2.6 | 0.9 | 2.9 |
| 10 | 1 & 2 | 1.8 | 0.6 | 2.1 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 70:** Distribution of households response on source of seedlings

| No. | Source | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=6405) | Infant Towns (N=931) | Rural (N=5474) |
| 1 | Government | 23.1 | 26.1 | 22.6 |
| 2 | NGO's | 0.5 | 0.4 | 0.5 |
| 3 | Own nursery | 2.1 | 1.5 | 2.2 |
| 4 | Market | 8.6 | 8.6 | 8.6 |
| 5 | Nursery | 26.7 | 21.9 | 27.5 |
| 6 | Don't use | 28.7 | 32.3 | 28.1 |
| 7 | Others | 1.7 | 2.8 | 1.6 |
| 8 | 1 & 5 | 4.4 | 2.7 | 4.7 |
| 9 | 4 & 5 | 2.6 | 1.7 | 2.7 |
| 10 | 1 & 4 | 1.6 | 1.9 | 1.5 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 71:** Response of households on planting more if seedlings are available

| No. | Response | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=6576) | Infant Towns (N=951) | Rural (N=5625) |
| 1 | Yes | 45.8 | 43.2 | 46.2 |
| 2 | No | 54.2 | 56.8 | 53.8 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 72:** Distribution of the required number of seedlings to plant more

| No. | Number of seedlings | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=3002) | Infant Towns (N=409) | Rural (N=2593) |
| 1 | <10 | 11.3 | 18.6 | 10.2 |
| 2 | 11-100 | 68.5 | 66.0 | 68.8 |
| 3 | 101-500 | 16.8 | 11.5 | 17.6 |
| 4 | 501-1000 | 2.4 | 2.9 | 2.3 |
| 5 | >1000 | 1.1 | 1.0 | 1.1 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 73:** Response of households on not wanting more seedlings

| No. | Reason | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=2899) | Infant Towns (N=403) | Rural (N=2496) |
| 1 | Shortage of land | 19.7 | 15.1 | 20.4 |
| 2 | Shortage of labour | 1.7 | 1.7 | 1.7 |
| 3 | Shortage of time | 1.0 | 2.0 | 0.8 |
| 4 | Shortage of water | 6.2 | 5.7 | 6.3 |
| 5 | Others | 61.0 | 69.5 | 59.7 |
| 6 | 1 & 4 | 4.8 | 2.2 | 5.2 |
| 7 | 1 & 2 | 2.9 | 2.0 | 3.1 |
| 8 | 1, 2 & 3 | 2.7 | 1.7 | 2.8 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 74:** Response of households on where to get trees for construction

| No. | Place | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=6463) | Infant Towns (N=947) | Rural (N=5516) |
| 1 | Own plantation | 23.7 | 15.8 | 25.0 |
| 2 | Community forest | 7.4 | 8.1 | 7.3 |
| 3 | State forest/enclosure | 2.5 | 2.5 | 2.5 |
| 4 | Market | 38.0 | 45.6 | 36.7 |
| 5 | Don’t use | 8.8 | 9.9 | 8.6 |
| 6 | Others | 1.6 | 2.0 | 1.5 |
| 7 | 1 & 4 | 9.0 | 6.8 | 9.4 |
| 8 | 2 & 4 | 3.2 | 3.2 | 3.2 |
| 9 | 3 & 4 | 1.0 | 0.8 | 1.1 |
| 10 | 1 & 3 | 0.5 | 0.2 | 0.5 |
| 11 | 2 & 3 | 0.5 | 0.5 | 0.5 |
| 12 | 1 & 2 | 2.5 | 3.0 | 2.4 |
| 13 | 1, 2 & 4 | 1.2 | 1.5 | 1.2 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 75:** Response of households on participation in different development programs

| No. | Programme | Response of HOUSEHOLD (in %) for Participation | | |
|---|---|---|---|---|
| | | Region (N=6233) | Infant Towns (N=910) | Rural (N=5323) |
| 1 | Terracing | 34.8 | 39.0 | 34.0 |
| 2 | Plant seedlings | 1.9 | 2.5 | 1.8 |
| 3 | Development of ditch spring | 0.5 | 0.5 | 0.5 |
| 4 | Construction of dams | 5.6 | 5.6 | 5.6 |
| 5 | Construction of roads | 1.2 | 1.4 | 1.2 |
| 6 | Others | 12.7 | 15.7 | 12.2 |
| 7 | 1 & 5 | 1.7 | 1.4 | 1.7 |
| 8 | 1 & 4 | 8.1 | 8.4 | 8.1 |
| 9 | 1 & 3 | 1.3 | 1.5 | 1.3 |
| 10 | 1 & 2 | 7.2 | 5.8 | 7.4 |
| 11 | 1, 4 & 5 | 2.8 | 2.1 | 2.9 |
| 12 | 1, 2 & 5 | 1.9 | 0.9 | 2.0 |
| 13 | 1, 2 & 4 | 3.3 | 3.7 | 3.2 |
| 14 | 1, 2 & 3 | 2.6 | 1.1 | 2.8 |
| 15 | 1, 3, 4 & 5 | 1.1 | 0.4 | 1.2 |
| 16 | 1, 2, 4 & 5 | 2.4 | 2.4 | 2.3 |
| 17 | 1, 2, 3 & 4 | 3.7 | 2.0 | 4.0 |
| 18 | 1, 2, 3, 4, & 5 | 7.4 | 5.4 | 7.7 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 76:** Response of households on importance of the development programs

| No. | Evaluation | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=6988) | Infant Towns (N=1097) | Rural (N=5891) |
| 1 | Important | 85.8 | 77.8 | 87.3 |
| 2 | Not Important | 14.2 | 22.2 | 12.7 |
| | Total | 100.0 | 100.0 | 100.0 |

**Table 3.3. 77:** Response of households on organizer of the different programms

| No. | Organizer | Response of HOUSEHOLD in % | | |
|---|---|---|---|---|
| | | Region (N=6542) | Infant Towns (N=942) | Rural (N=5600) |
| 1 | Government | 66.6 | 65.1 | 66.9 |
| 2 | NGO's | 0.3 | 0.6 | 0.3 |
| 3 | Community | 8.7 | 9.6 | 8.6 |
| 4 | Others | 7.0 | 7.4 | 6.9 |
| 5 | 1 & 3 | 14.9 | 15.9 | 14.8 |
| 6 | 2 & 3 | 1.7 | 0.8 | 1.9 |
| 7 | 1, 2 & 3 | 0.7 | 0.5 | 0.8 |
| | Total | 100.0 | 100.0 | 100.0 |

### *3.3.1.13. Food Security and coping mechanism*

Food security is another important dimension of development in the agriculture sector. Efforts were made to ensure food security through enabling chronically food insecure households participate in productive safety net program and household asset building to prepare the ground for a smooth transition to speed up their graduation (National planning Commission, 2016).

Table 3.3.78 shows the number of householders who responded to the period for how long they had enough food. Among the total householders, 2.5% of the householders in the region had no enough food in the whole year, while 2.7 % had enough food only for 1-2 months. Generally, 54% of the householders had enough food for 10-12 months, but 43% of the householders had shortages of food for the period ranging between 1 and 10 months.

In the urban, 75% of the householders responded to having enough food for the period of over 10 months. However, 5.3% of the sampled householders responded to shortages of food throughout the year. In the rural area, 44% of the householders responded to sufficiency of food for a year. It is only one percent who responded to shortages of food throughout the year.

**Table 3.3. 78:** Response of householders to how long (mo) they had enough food

| No | Period | Response of HOUSEHOLD (in %) | | | |
|---|---|---|---|---|---|
| | | Region (N=12266) | Urban (N=4127) | Infant Towns (N=1686) | Rural (N=6453) |
| 1 | None | 2.5 | 5.3 | 1.7 | 0.9 |
| 2 | 1-2 months | 2.7 | 1.3 | 3.4 | 3.4 |
| 3 | 3-4 months | 7.4 | 3.7 | 7.1 | 9.9 |
| 4 | 5-6 months | 10.3 | 3.2 | 8.8 | 15.3 |
| 5 | 7-8 months | 12.2 | 4.7 | 11.6 | 17.1 |
| 6 | 9-10 months | 10.5 | 6.7 | 9.7 | 13.2 |
| 7 | >10 months | 54.4 | 75.2 | 57.7 | 40.2 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 |

Table 3.3.79 shows the number and percent of householders who responded to which months they had/hadn't enough food. Regionally, about 91-93 % of the house holders said they had enough food in November, December, and January. Starting from February, the percent of householders who responded to sufficiency of food declined progressively. July and August were the months with lower percentage of the householders (59-60%) who responded to having enough food. With regard to the urban and rural, food sufficiency in the months followed the same trend as it was noted for the region. In rural, sufficiency for food was improved starting from September probably because of the new harvest which could be used as dry or fresh ones.

**Table 3.3. 79:** Number of HOUSEHOLD responded to which months they had enough food

| No. | Month | Region | | | Urban | | | Infant Towns | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No. of HOUSEHOLD | | | No. of HOUSEHOLD | | | No. of HOUSEHOLD | | | No. of HOUSEHOLD | | |
| | | Yes | Total HOUSEHOLD | % for Yes | Yes | Total HOUSEHOLD | % for Yes | Yes | Total HOUSEHOLD | % for Yes | Yes | Total HOUSEHOLD | % for Yes |
| 1 | Sept | 8191 | 12276 | 66.7 | 3433 | 4130 | 83.1 | 1185 | 1687 | 70.2 | 3573 | 6459 | 55.3 |
| 2 | Oct. | 7408 | 12268 | 60.4 | 3531 | 4122 | 85.7 | 1359 | 1687 | 80.6 | 4738 | 6459 | 73.4 |
| 3 | Nov | 11197 | 12268 | 91.3 | 3672 | 4122 | 89.1 | 1562 | 1687 | 92.6 | 5963 | 6459 | 92.3 |
| 4 | Dec. | 11377 | 12260 | 92.8 | 3702 | 4114 | 90 | 1574 | 1687 | 93.3 | 6101 | 6459 | 94.5 |
| 5 | Jan | 11191 | 12266 | 91.2 | 3710 | 4120 | 90 | 1557 | 1687 | 92.3 | 5924 | 6459 | 91.7 |
| 6 | Feb | 10688 | 12266 | 87.1 | 3630 | 4120 | 88.1 | 1489 | 1687 | 88.3 | 5569 | 6459 | 86.2 |
| 7 | March | 10158 | 12267 | 82.8 | 3584 | 4121 | 87 | 1426 | 1687 | 84.5 | 5148 | 6459 | 79.7 |
| 8 | April | 9667 | 12266 | 78.8 | 3558 | 4120 | 86.4 | 1362 | 1687 | 80.7 | 4747 | 6459 | 73.5 |
| 9 | May | 6179 | 12266 | 50.4 | 3486 | 4120 | 84.6 | 1259 | 1687 | 74.6 | 4194 | 6459 | 64.9 |
| 10 | June | 8213 | 12268 | 66.9 | 3415 | 4122 | 82.8 | 1157 | 1687 | 68.6 | 3641 | 6459 | 56.4 |
| 11 | July | 7411 | 12267 | 60.4 | 3329 | 4121 | 80.8 | 1061 | 1687 | 62.9 | 3021 | 6459 | 46.8 |
| 12 | Aug | 7196 | 12263 | 58.7 | 3319 | 4117 | 80.6 | 1038 | 1687 | 61.5 | 2839 | 6459 | 44.0 |

Table 3.3.80 shows the response of householders to the type of mechanisms with which they cope with the food shortages. Eating less food per day and per meal, borrowing grain &/or money, and eating less preferred food are among the frequently answered mechanisms. About 11-14% of the householders in the region responded to eating less food per day and per meal, and borrowing money &/or grain to cope with situations of food shortages. Eating less preferred food was responded by 10% of the householders. Relief aid (12%) in form of grain, food for work or safety net program is another program which eases people to cope with food shortages.

The coping mechanisms used in the urban and rural followed similar trend as it was noted in the region. However about 16 % of the householders in the rural benefit from relief aid in the rural but few percentages of the householders (3.2 %) in the urban received food aid. Selling of livestock as coping mechanism was also responded by 13% of the householders in the rural.

**Table 3.3. 80:** Response of house holders to the coping mechanisms they implement during shortages of food

| No. | Coping mechanisms | Region | | | Urban | | | Infant Towns | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No. of HH | | | No. of HH | | | No. of HH | | | No. of HH | | |
| | | Yes | Total HH | % for Yes | Yes | Total HH | % for Yes | Yes | Total HH | % for Yes | Yes | Total HH | % for Yes |
| 1 | Selling of productive assets | 137 | 3535 | 3.9 | 137 | 3535 | 3.9 | | 1687 | 0 | | 6459 | 0 |
| 2 | Eating food which is not consumed normally | 383 | 11650 | 3.3 | 198 | 3504 | 5.7 | 29 | 1687 | 1.7 | 156 | 6459 | 2.4 |
| 3 | Eat less preferred food | 1158 | 11649 | 9.9 | 347 | 3503 | 9.9 | 133 | 1687 | 7.9 | 678 | 6459 | 10.5 |
| 4 | Looking for off farm activities | 810 | 11645 | 7 | 109 | 3499 | 3.1 | 92 | 1687 | 5.5 | 609 | 6459 | 9.4 |
| 5 | Borrow grain and//or cash | 1334 | 11660 | 11.4 | 419 | 3514 | 11.9 | 143 | 1687 | 8.5 | 772 | 6459 | 12.0 |
| 6 | Eat less food in a day | 1617 | 11651 | 13.9 | 477 | 3505 | 13.6 | 204 | 1687 | 12.1 | 936 | 6459 | 14.5 |
| 7 | Eat less food per meal | 1527 | 11653 | 13.1 | 404 | 3507 | 11.5 | 179 | 1687 | 10.6 | 944 | 6459 | 14.6 |
| 8 | Sell livestock | 1116 | 11645 | 9.6 | 62 | 3499 | 1.8 | 97 | 1687 | 5.7 | 957 | 6459 | 14.8 |
| 9 | Sell household utensils | 113 | 11643 | 1 | 74 | 3497 | 2.1 | 5 | 1687 | 0.3 | 34 | 6459 | 0.5 |
| 10 | Sell firewood | 149 | 11642 | 1.3 | 49 | 3496 | 1.4 | 12 | 1687 | 0.7 | 88 | 6459 | 1.4 |
| 11 | Making & selling charcoals | 117 | 11641 | 1 | 46 | 3495 | 1.3 | 14 | 1687 | 0.8 | 57 | 6459 | 0.9 |
| 12 | Rent out land | 116 | 11642 | 1 | 33 | 3496 | 0.9 | 16 | 1687 | 0.9 | 67 | 6459 | 1.0 |
| 13 | Withdraw children from school | 84 | 11643 | 0.7 | 44 | 3497 | 1.3 | 1 | 1687 | 0.1 | 39 | 6459 | 0.6 |
| 14 | Selling of jewellery | 77 | 11642 | 0.7 | 39 | 3496 | 1.1 | 2 | 1687 | 0.1 | 36 | 6459 | 0.6 |
| 15 | Distressed migration | 132 | 11642 | 1.1 | 37 | 3496 | 1.1 | 14 | 1687 | 0.8 | 81 | 6459 | 1.3 |
| 16 | Relief aid | 1391 | 11642 | 11.9 | 111 | 3496 | 3.2 | 195 | 1687 | 11.6 | 1085 | 6459 | 16.8 |
| | Total | 10261 | 178225 | | 2586 | | | 7675 | | | | | |

### 3.3.2. Livestock production

#### *3.3.2.1. Household participation in livestock production*

Table 3.3.81 presents information on the proportion of rural households who are engaged in livestock production. Regionally, about half of the households (49.22 percent) are involved in livestock farming activities. The involvement of households in livestock activities is higher in rural areas (74.54 percent) as compared to infant towns (45.61 percent) and urban areas (11.47 percent). Of the total female households, about 28.25 percent practice livestock farming with 51.18 percent in rural, 25.93 percent in infant town and 7.48 percent in urban.

**Table 3.3. 81: Proportion of households engaged in livestock rearing in Tigray (N = 12316 HOUSEHOLDs)**

| Category | Sex of HOUSEHOLDs | Participation of farmers in livestock farming (% of HOUSEHOLDs) | |
|---|---|---|---|
| | | Yes | No |
| Regional | Male | 59.80 | 40.20 |
| | Female | 28.25 | 71.75 |
| | Total | 49.22 | 50.78 |
| Urban | Male | 14.52 | 85.48 |
| | Female | 7.48 | 92.52 |
| | Total | 11.47 | 88.53 |
| Infant town | Male | 57.09 | 42.91 |
| | Female | 25.93 | 74.07 |
| | Total | 45.61 | 54.39 |
| Rural | Male | 82.92 | 17.08 |
| | Female | 51.18 | 48.82 |
| | Total | 74.54 | 25.46 |

N = Total number of respondents; HOUSEHOLDs = Households

#### *3.3.2.2. Purpose of livestock production*

Farmers raise various animal types for different purposes. Rural households keep cattle for the purpose to draft power, income and manure in the rank of first, second and third. Small ruminants are kept for the purpose of income, meat and breeding. Donkey is an important animal as pack and income generation. Donkeys are used for transportation, water fetching, marketing and other uses. Farmers rear chickens as source of eggs, meat and income.

#### *3.3.2.3. Land ownership for livestock producers*

Land is the key factor in the agriculture production process and it is an important asset for livestock producers. Of the total urban livestock owning households (N = 478 HOUSEHOLDs), majority (88 percent) have own land for livestock activities while the rest 12 percent are landless (Table 3.3.81).

**Table 3.3. 82: Land availability for urban livestock production in Tigray (N = 478 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Category | Land availability for livestock farming | | Livestock holders |
|---|---|---|---|
| | No land | Have land | |
| Regional | 12 | 88 | 6060 |
| Urban | 12 | 88 | 478 |
| Infant town | - | - | 769 |
| Rural | - | - | 4813 |

N = Total number of respondents; HOUSEHOLDs = Households

On average, livestock producers hold 127 meter square farm size with zero the minimum (landless) and 10000 m2 the maximum (Table 3.3.83). Commercial livestock farmers hold nearly one hectare land. The farm land holding is relatively higher in central (261 m2/HOUSEHOLD) and north west (202 m2/HOUSEHOLD) followed by southern zone (131 m2/HOUSEHOLD). Lower land holding belongs to urban households of Mekelle (72 m2/HOUSEHOLD) and eastern (20 m2/HOUSEHOLD) zones.

**Table 3.3. 83: The average, minimum and maximum livestock farm size holding (m2/HOUSEHOLD) in urban areas of Tigray regional state (N = 478 HOUSEHOLDs)**

| Zone | Average | Minimum | Maximum |
|---|---|---|---|
| Southern | 131.59 | 0 | 2500 |
| Mekelle | 72.25 | 0 | 350 |
| Eastern | 19.98 | 0 | 350 |
| Central | 261.22 | 0 | 100 |
| Western | 78.47 | 0 | 10000 |
| North west | 202.21 | 0 | 400 |
| Overall | 127.62 | 0 | 10000 |

N = Total number of respondents; HOUSEHOLDs = Households

***3.3.2.4. Livestock holding types***

Table 3.3.84 shows the proportion of livestock households owning each type of livestock. As shown on the table, cattle are the most common types of livestock owned by rural households. About 83.78 percent of households that own livestock have cattle. Cattle holders are more in rural (88.39 percent) and infant town (76.20 percent) than urban (49.58 percent). Cattle are followed by chicken (45.50 percent), goats (27.33 percent) and sheep (25.78 percent) in that order. This indicates that cattle are an important animal for the households related with agricultural activities such as land ploughing, land preparation and threshing. Chickens are also important investment option for the rural people as source of food (eggs and meat) and cash income. Donkeys are owned by more people (45.18 percent) as pack animal. Approximately 6.08 percent of the livestock owning households have beehives.

**Table 3.3. 84: Livestock holding by type among households in Tigray (N=6060 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Animal type | Regional | Urban | Infant town | Rural |
|---|---|---|---|---|
| Cattle | 83.78 | 49.58 | 76.20 | 88.39 |
| Sheep | 25.78 | 33.05 | 24.19 | 25.31 |
| Goats | 27.33 | 7.32 | 24.84 | 29.71 |
| Donkeys | 42.18 | 13.39 | 40.83 | 45.25 |
| Horses | 0.58 | 2.51 | 1.30 | 0.27 |
| Mules | 0.64 | 0.21 | 0.65 | 0.69 |
| Camels | 3.00 | 0.84 | 4.42 | 2.99 |
| Chickens | 45.50 | 36.19 | 45.25 | 46.46 |
| Pig | 0.03 | 0.42 | 0.00 | 0.00 |
| Bee hive | 6.08 | 1.26 | 4.29 | 6.86 |

N = Total number of respondents; HOUSEHOLDs = Households

***3.3.2.5. Livestock herd size and composition***

The livestock herd size per household is presented in Table 3.3.85. On average, households own 3.36 TLU livestock, which is comprised of 3.18 cattle (2.46 TLU), 1.96 goats (0.19 TLU), 1.40 sheep (0.14 TLU), 2.89 chickens (0.033 TLU) and 0.918 donkeys (0.459 TLU). This shows that cattle are the dominant animal in the animal herd. Goats and sheep are also largely owned by holders. Livestock holding is more in infant town (3.82 TLU) and rural (3.32 TLU) than urban (2.88 TLU). Sheep holding is more in urban while goats out number sheep in rural areas.

**Table 3.3. 85: Livestock herd size per household in Tigray (N = 6060 HOUSEHOLDs)**

| Animal | Regional | | | Urban | | Infant town | | Rural | |
|---|---|---|---|---|---|---|---|---|---|
| type | Number | TLU | TLU % | Number | TLU | Number | TLU | Number | TLU |
| Cattle | 3.186 | 2.468 | 73.28 | 2.790 | 2.330 | 3.976 | 2.945 | 3.104 | 2.442 |
| Bull | 0.282 | 0.165 | 4.91 | 0.190 | 0.110 | 0.348 | 0.209 | 0.291 | 0.174 |
| Oxen | 1.019 | 1.123 | 33.35 | 0.420 | 0.460 | 0.955 | 1.051 | 1.095 | 1.205 |
| Cows | 0.891 | 0.891 | 26.45 | 1.600 | 1.600 | 1.227 | 1.227 | 0.773 | 0.773 |
| Heifer | 0.345 | 0.172 | 5.11 | 0.170 | 0.080 | 0.563 | 0.281 | 0.333 | 0.166 |
| Calves | 0.622 | 0.126 | 3.74 | 0.410 | 0.080 | 0.881 | 0.176 | 0.609 | 0.121 |
| Sheep | 1.407 | 0.141 | 4.19 | 2.660 | 0.270 | 1.776 | 0.177 | 1.225 | 0.122 |
| Goats | 1.965 | 0.197 | 5.86 | 0.500 | 0.050 | 2.631 | 0.263 | 2.010 | 0.201 |
| Donkeys | 0.918 | 0.459 | 13.64 | 0.200 | 0.100 | 0.651 | 0.325 | 1.036 | 0.518 |
| Horses | 0.008 | 0.011 | 0.32 | 0.020 | 0.020 | 0.023 | 0.018 | 0.004 | 0.003 |
| Mules | 0.006 | 0.000 | 0.00 | 0.000 | 0.000 | 0.006 | 0.004 | 0.008 | 0.005 |
| Camels | 0.047 | 0.056 | 1.66 | 0.010 | 0.010 | 0.058 | 0.064 | 0.047 | 0.052 |
| Chickens | 2.893 | 0.033 | 0.98 | 7.250 | 0.070 | 2.834 | 0.028 | 2.468 | 0.024 |
| Pigs | 0.002 | 0.001 | 0.02 | 0.030 | 0.010 | 0.000 | 0.000 | 0.000 | 0.000 |
| Bee hive | 0.158 | - | - | 0.040 | - | 0.161 | - | 0.170 | - |
| Total | - | 3.368 | 100.00 | - | 2.880 | - | 3.828 | - | 3.371 |

N = Total number of respondents; HOUSEHOLDs = Households; TLU = Tropical Livestock Unit (An animal with about 250 kg live body weight)

### *3.3.2.6. Livestock herd/flock composition by age and sex*

**Cattle herd composition by age and sex**

As shown in Table 3.3.86, households own 3.159 cattle, which is comprised of 1.019 oxen (32 percent), 0.891 cows (28 percent), 0.622 calves (20 percent), 0.345 heifers (11 percent) and 0.282 bulls (9 percent). This indicates that oxen are the dominant animals in the herd, serving as source of draft power for land ploughing, an important business for households. The bigger proportion of cows next to oxen indicates the paramount importance of cattle production in producing calves to replace retired oxen.

**Table 3.3. 86: Cattle herd composition by age and sex in Tigray (N = 6060 HOUSEHOLDs)**

| Cattle class | Regional | | Urban | | Infant town | | Rural | |
|---|---|---|---|---|---|---|---|---|
| | Holding | Share | Holding | Share | Holding | Share | Holding | Share |
| Bulls | 0.282 | 8.93 | 0.190 | 6.81 | 0.348 | 8.76 | 0.291 | 9.38 |
| Oxen | 1.019 | 32.26 | 0.420 | 15.05 | 0.955 | 24.03 | 1.095 | 35.31 |
| Cows | 0.891 | 28.21 | 1.600 | 57.35 | 1.227 | 30.88 | 0.773 | 24.93 |
| Heifers | 0.345 | 10.92 | 0.170 | 6.09 | 0.563 | 14.17 | 0.333 | 10.74 |
| Calves | 0.622 | 19.69 | 0.410 | 14.70 | 0.881 | 22.17 | 0.609 | 19.64 |
| Total | 3.159 | 100.00 | 2.790 | 100.00 | 3.974 | 100.00 | 3.101 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

**Sheep flock composition by age and sex**

Sheep flock structure is presented in Table 3.3.86, which shows that sheep herd (1.29) is dominated by ewes, accounting for about 60 percent of the flock followed by lambs (25 percent) and rams (14 percent). The higher proportion of ewes in the flock indicates the importance of sheep production among the rural households.

**Table 3.3. 87: Sheep flock composition by age and sex in Tigray (N = 5582 HOUSEHOLDs)**

| Sheep class | Regional | | Infant town | | Rural | |
|---|---|---|---|---|---|---|
| | Holding | Share | Holding | Share | Holding | Share |
| Sheep rams | 0.181 | 13.93 | 0.232 | 13.08 | 0.173 | 14.13 |
| Sheep ewes | 0.787 | 60.59 | 1.172 | 66.07 | 0.726 | 59.31 |
| Sheep lambs | 0.331 | 25.48 | 0.370 | 20.86 | 0.325 | 26.55 |
| Total | 1.299 | 100.00 | 1.774 | 100.00 | 1.224 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

**Goat flock composition by age and sex**

Table 3.3.88 presents information on structure of goat flock. Goat flock (2.09) is largely dominated by female goats (57 percent) and young goats (32 percent) which indicate the

significant importance of goat production in the region as the major enterprise in the farm community.

**Table 3.3. 88: Goat flock composition by age and sex in Tigray (N = 5582 HOUSEHOLDs)**

| Goat class | Regional | | Infant town | | Rural | |
|---|---|---|---|---|---|---|
| | Holding | Share | Holding | Share | Holding | Share |
| Goat bucks | 0.214 | 10.21 | 0.204 | 7.75 | 0.215 | 10.70 |
| Goat does | 1.202 | 57.37 | 1.797 | 68.30 | 1.107 | 55.10 |
| Goat kids | 0.679 | 32.41 | 0.63 | 23.95 | 0.687 | 34.20 |
| Total | 2.095 | 100.00 | 2.631 | 100.00 | 2.009 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

**Chicken flock composition by age and sex**

At regional level, on average, households own 2.518 chickens which is comprised of 1.348 hens (54 percent), 0.904 chicks (36 percent) and 0.266 cocks (11 percent) (Table 3.3.89). The bigger proportion of female chickens (hens) shows the importance of chicken production as investment option among the rural households.

**Table 3.3. 89: Chicken flock composition by age and sex in Tigray (N = 5582 HOUSEHOLDs)**

| Chicken class | Regional | | Infant town | | Rural | |
|---|---|---|---|---|---|---|
| | Holding | Share | Holding | Share | Holding | Share |
| Cocks | 0.266 | 10.56 | 0.331 | 11.68 | 0.256 | 10.37 |
| Hens | 1.348 | 53.53 | 1.698 | 59.94 | 1.292 | 52.35 |
| Chicks | 0.904 | 35.90 | 0.804 | 28.38 | 0.920 | 37.28 |
| Total | 2.518 | 100.00 | 2.833 | 100.00 | 2.468 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

***3.3.2.7. Cattle breed composition***

Table 3.3.90 provides information on proportion of livestock households owning exotic/hybrid cattle. Most of the cattle holders (98.39 percent) own indigenous breeds while few hold hybrid (5.79 percent) and exotic (2.29 percent). This indicates that the cattle production of the region is being run using indigenous breeds, which are blamed for low production potential. Exotic cattle owing holders are more in infant town (6.14 percent) than rural (1.76 percent).

**Table 3.3. 90: Cattle breed percent among cattle owning households in Tigray (N = 4840 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Cattle breed | Regional | Infant town | Rural |
|---|---|---|---|
| Local | 98.39 | 95.56 | 98.78 |
| Hybrid | 5.79 | 9.39 | 5.29 |
| Exotic | 2.29 | 6.14 | 1.76 |

N = Total number of respondents; HOUSEHOLDs = Households

Similarly, based on cattle holding size, most of the cattle are indigenous breeds (94 percent) and only 2 percent are exotic (Table 3.3.91). Exotic cattle are less in rural than infant town.

**Table 3.3. 91: Cattle breed composition per household in Tigray (N = 4840 HOUSEHOLDs)**

| Cattle breed | Regional | | Infant town | | Rural | |
|---|---|---|---|---|---|---|
| | Holding | Share | Holding | Share | Holding | Share |
| Local | 2.9957 | 93.83 | 3.3940 | 89.11 | 2.9320 | 94.76 |
| Hybrid | 0.1255 | 3.93 | 0.2366 | 6.21 | 0.1078 | 3.48 |
| Exotic | 0.0714 | 2.24 | 0.1781 | 4.68 | 0.0544 | 1.76 |
| Total | 3.1926 | 100.00 | 3.8087 | 100.00 | 3.0942 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

***3.3.2.8. Oxen ownership***

Of the total livestock households, approximately 35 percent have no ox while 29 percent own one ox and 31 percent own pair oxen (Table 3.3.92). Fewer of the households (4 percent) own three and above oxen. Oxen less farmers are more in infant town (48 percent) than rural (33 percent).

**Table 3.3. 92: Oxen ownership per household in Tigray (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Ox number | Regional | Infant town | Rural |
|---|---|---|---|
| No ox | 35.22 | 48.76 | 33.06 |
| One ox | 29.42 | 20.29 | 30.87 |
| Pair oxen | 31.21 | 26.01 | 32.04 |
| Three and above oxen | 4.16 | 4.94 | 4.03 |
| Total | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

***3.3.2.9. Trend of livestock herd size***

The trend of livestock herd size in the past five and ten years is summarized in Table 3.3.93. As shown on the table, there was decrement in cattle, sheep and goat holding among the rural households in the past five and ten years. Similarly, decrement is observed in chicken and beehive holding. On the other hand, increment is shown on equines and camels.

**Table 3.3. 93: Trend of livestock ownership per household in the past 5 and 10 years (2008 – 2017) in infant town and rural areas of Tigray regional state (N = 5582 HOUSEHOLDs)**

| Animal type | Now (2017) | Before five years (2012) | Change after 5 years (%) | Before ten years (2008) | Change after ten years (%) |
|---|---|---|---|---|---|
| Cattle | 3.220 | 3.494 | -9 | 3.630 | -13 |
| Sheep | 1.30 | 1.176 | 10 | 1.484 | -14 |
| Goats | 2.09 | 2.647 | -27 | 2.737 | -31 |
| Donkeys | 0.98 | 0.361 | 63 | 0.444 | 55 |
| Horses | 0.007 | 0.003 | 57 | 0.004 | 43 |
| Mules | 0.007 | 0.001 | 86 | 0.002 | 71 |
| Camels | 0.05 | 0.020 | 60 | 0.025 | 50 |
| Pigs | 0.00 | 0.00 | 0 | 0.000 | 0 |
| Chicken | 2.52 | 2.321 | 8 | 3.057 | -21 |
| Bee hive | 0.09 | 0.106 | -18 | 0.171 | -90 |
| Total | - | - | - | - | - |

N = Total number of respondents; HOUSEHOLDs = Households

***2.6.2.10. Household livestock asset ownership***

Livestock are a big assess for the agrarian community. The livestock value of each animal type in presented in Table 3.3.94. Attempt was made to estimate the livestock value for each animal type based on the current market selling price. Regionally, on average, a livestock producer possesses approximately 32203 Eth birr in the form of livestock with 31280 Eth birr for rural holders and 17587 for urban holders. Bigger livestock value belongs to cattle accounting for about 83 percent of the total livestock value (32203 Eth birr/HOUSEHOLD) followed by small ruminants (5.68 percent), donkey (5.44 percent) and chickens (2.83 percent) in that order. More value is stocked in the form of cows which accounts for more than 35 percent of the livestock asset value. This indicates also that the bigger livestock investment is endowed in cattle, sheep and chicken.

**Table 3.3. 94: Household livestock asset ownership in the last 12 months (March 2017 – April 2018) in Tigray (N = 12316 HOUSEHOLDs)**

| Animal type | Regional | | | Urban | | | Infant town | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Holding | Value (Birr) | % | Holding | Value (Birr) | % | Holding | Value (Birr) | % | Holding | Value (Birr) | % |
| Bulls | 0.282 | 2642 | 8.21 | 0.19 | 773 | 4.40 | 0.348 | 3261 | 8.32 | 0.291 | 2727 | 8.72 |
| Oxen | 1.019 | 8721 | 27.08 | 0.42 | 2182 | 12.41 | 0.955 | 8173 | 20.86 | 1.095 | 9371 | 29.96 |
| Cows | 0.891 | 11418 | 35.46 | 1.60 | 8894 | 50.57 | 1.227 | 15723 | 40.13 | 0.773 | 9906 | 31.67 |
| Heifers | 0.345 | 2681 | 8.32 | 0.17 | 1321 | 7.51 | 0.563 | 4375 | 11.17 | 0.333 | 2587 | 8.27 |
| Calves | 0.622 | 1398 | 4.34 | 0.41 | 922 | 5.24 | 0.881 | 1980 | 5.05 | 0.609 | 1369 | 4.38 |
| Sheep | 1.407 | 848 | 2.63 | 2.66 | 1519 | 8.64 | 1.776 | 1071 | 2.73 | 1.225 | 739 | 2.36 |
| Goats | 1.965 | 983 | 3.05 | 0.50 | 156 | 0.89 | 2.631 | 1316 | 3.36 | 2.01 | 1005 | 3.21 |
| Donkeys | 0.918 | 1753 | 5.44 | 0.20 | 382 | 2.17 | 0.651 | 1243 | 3.17 | 1.036 | 1979 | 6.33 |
| Horses | 0.008 | 91 | 0.28 | 0.02 | 284 | 1.61 | 0.023 | 262 | 0.67 | 0.004 | 46 | 0.15 |
| Mules | 0.006 | 52 | 0.16 | 0.00 | 172 | 0.98 | 0.006 | 52 | 0.13 | 0.008 | 69 | 0.22 |
| Camels | 0.047 | 569 | 1.77 | 0.01 | 121 | 0.69 | 0.058 | 702 | 1.79 | 0.047 | 569 | 1.82 |
| Chickens | 2.893 | 912 | 2.83 | 7.25 | 840 | 4.78 | 2.834 | 894 | 2.28 | 2.468 | 778 | 2.49 |
| Pig | 0.002 | 9 | 0.03 | 0.03 | 4 | 0.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| Bee hive | 0.158 | 126 | 0.39 | 0.04 | 17 | 0.10 | 0.161 | 129 | 0.33 | 0.17 | 136 | 0.43 |
| Total | - | 32203 | 100.00 | - | 17587 | 100.00 | - | 39180 | 100.00 | - | 31280 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

#### *3.3.2.11. Livestock acquisition and disposition*

Table 3.3.95 presents livestock acquisition and disposition by type. The table shows that about 12.57 percent of the livestock owing households purchased at least some livestock in the 12 months preceding the survey. Animal purchasing is most common for chicken (8.81 percent) and sheep (5.70 percent). Nearly 22.61 percent of the households sold at least some livestock in the reference dates. Selling live animals is most common for goat (15.64 percent), sheep (13.00 percent) and chicken (8.23 percent).

**Table 3.3. 95: Livestock acquisition and disposition among livestock owning households in the last 12 months (March 2017 – April 2018) in Tigray (N = 12316 HOUSEHOLDs)**

| Animal | Buying any animal | | | | Selling any animal | | | | Losing any animal | | | | Slaughtering any animal | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| type | Rg | Ur | IT | Ru | Rg | Ur | IT | Ru | Rg | Ur | IT | Ru | Rg | Ur | IT | Ru |
| Bulls | 2.00 | 8.89 | 9.74 | 10.63 | 3.97 | 22.22 | 30.52 | 21.78 | 4.61 | 8.89 | 12.99 | 35.19 | 0.19 | 0.00 | 3.25 | 0.93 |
| Oxen | 2.29 | 28.57 | 0.76 | 1.40 | 7.23 | 34.07 | 7.36 | 2.64 | 4.47 | 10.99 | 3.05 | 4.62 | 1.20 | 2.20 | 0.25 | 0.12 |
| Cows | 2.76 | 14.95 | 2.36 | 1.67 | 6.56 | 17.01 | 7.35 | 5.42 | 6.95 | 17.01 | 8.66 | 5.66 | 0.65 | 1.55 | 0.26 | 0.64 |
| Heifers | 1.65 | 3.57 | 2.58 | 1.35 | 3.21 | 17.86 | 3.61 | 2.28 | 1.89 | 1.79 | 3.09 | 1.66 | 0.16 | 0.00 | 0.00 | 0.21 |
| Calves | 0.41 | 3.48 | 0.63 | 0.17 | 0.81 | 7.83 | 0.63 | 0.39 | 2.67 | 5.22 | 3.45 | 2.36 | 0.41 | 0.00 | 0.63 | 0.39 |
| Sheep | 5.70 | 27.22 | 6.99 | 2.71 | 13.00 | 41.14 | 11.29 | 9.61 | 10.37 | 36.71 | 12.90 | 6.57 | 13.38 | 46.84 | 17.20 | 8.46 |
| Goats | 3.56 | 37.14 | 5.76 | 2.45 | 15.64 | 34.29 | 24.08 | 14.06 | 14.25 | 40.00 | 27.75 | 11.82 | 14.55 | 40.00 | 31.41 | 11.68 |
| Donkeys | 2.11 | 17.19 | 2.23 | 1.65 | 1.13 | 12.50 | 1.91 | 0.69 | 1.17 | 17.19 | 1.27 | 0.69 | - | - | - | - |
| Horses | 17.14 | 25.00 | 10.00 | 15.38 | 0.00 | 0.00 | 0.00 | 0.00 | 5.71 | 8.33 | 10.00 | 0.00 | - | - | - | - |
| Mules | 10.26 | - | 0.00 | 9.09 | 5.13 | - | 0.00 | 3.03 | 0.00 | 0.00 | 0.00 | 0.00 | - | - | - | - |
| Camels | 4.95 | 25.00 | 2.94 | 4.86 | 1.65 | 25.00 | 0.00 | 1.39 | 1.10 | 0.00 | 0.00 | 1.39 | - | - | - | - |
| Chickens | 8.81 | 41.62 | 8.62 | 6.31 | 8.23 | 20.81 | 8.91 | 7.16 | 13.86 | 34.68 | 17.53 | 11.67 | 16.43 | 49.71 | 20.98 | 13.15 |
| Pigs | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Beehives | 0.37 | 16.67 | 3.29 | 4.10 | 1.12 | 0.00 | 0.00 | 1.44 | 0.37 | 16.67 | 0.00 | 0.00 | - | - | - | - |
| Overall | 12.57 | 43.93 | 13.13 | 9.89 | 22.61 | 45.40 | 28.22 | 19.41 | 26.67 | 41.84 | 29.26 | 24.72 | 15.73 | 37.66 | 22.63 | 12.45 |

N = Total number of respondents; HOUSEHOLDs = Households; Rg = Regional; Ur = Urban; IT = Infant town; Ru = Rural

About 26.67 percent of the households faced animal loss due to diseases and/or other factors. The animal loss appears to be more common in goats (14.25 percent), chicken (13.86 percent) and sheep (10.37 percent). About 15.73 percent of the households reported slaughtering at least one type of livestock during the reference period. The slaughtering of animals appears to be more common in chicken (16.43 percent), goats (14.55 percent) and sheep (13.38 percent). Chickens and small ruminants are often slaughtered during festivals and ceremonies. Animal slaughtering is more common in urban (37 percent) than rural (12 percent). Slaughtering livestock is less common than selling.

**Financial sources for animal purchase**

Livestock holders buy animals using a cash/finance obtained from different sources (Table 3.3.96). Holders secure cash from own farm (90 percent), sale of animals (80 percent), and saving (48 percent), ranking as first, second and third. The holders get cash also from loans, gifts and other sources.

**Table 3.3. 96: Financial source for animal purchases in the last 12 months (March 2017 – April 2018) in Tigray (N = 6060 HOUSEHOLDs)**

| Source of finance | Regional | | Urban | | Infant town | | Rural | |
|---|---|---|---|---|---|---|---|---|
| | % | R | % | R | % | R | % | R |
| Income from farm | 89.79 | 1 | 15.38 | 2 | 93.35 | 1 | 93.29 | 1 |
| Income from sale of livestock | 80.62 | 2 | 23.08 | 1 | 83.38 | 2 | 83.33 | 2 |
| Savings | 48.27 | 3 | 11.54 | 3 | 50.03 | 3 | 50.00 | 3 |
| Other source | 41.87 | 4 | 11.54 | 3 | 43.32 | 4 | 43.29 | 4 |
| Loan/gift from relative | 30.80 | 5 | 11.54 | 3 | 31.72 | 5 | 31.70 | 5 |
| Income from sale of animal products | 21.80 | 6 | 23.08 | 1 | 21.75 | 6 | 21.74 | 6 |
| Income from sale of other assets | 17.65 | 7 | 3.85 | 4 | 18.31 | 7 | 18.30 | 7 |
| Loan from other household | 7.96 | 8 | 0.00 | 5 | 8.34 | 8 | 8.33 | 8 |
| Total | 100.00 | - | 100.00 | - | 100.00 | - | 100.00 | - |

N = Total number of respondents; HOUSEHOLDs = Households; R = Rank

**Reasons for selling animals**

There are many factors that force holders to sell animals. Table 3.3.97 summarizes the reasons that make farmers to sell animals in Tigray. As per the respondents, animals are sold to get cash for buying family foods, implements and other livestock as the most reasons in that order. In addition, animals are sold to pay loans, rent land, covers school and health expenses and to buy agricultural inputs. Moreover, feed shortage force farmers to sell animals.

**Table 3.3. 97: Reasons for selling animals in Tigray regional state (N = 6060 HOUSEHOLDs)**

| Reasons for selling animals | Regional | | Urban | | Infant town | | Rural | |
|---|---|---|---|---|---|---|---|---|
| | % | R | % | R | % | R | % | R |
| Buy other implements | 52.72 | 2 | 12.00 | 3 | 53.55 | 2 | 53.61 | 2 |
| Help relatives | 11.38 | 5 | 0.00 | 6 | 11.61 | 4 | 11.62 | 4 |
| Buy food | 79.88 | 1 | 44.00 | 1 | 80.58 | 1 | 80.67 | 1 |
| Buy other goods | 9.17 | 8 | 4.00 | 5 | 9.27 | 6 | 9.28 | 6 |
| Buy seeds | 9.34 | 7 | 0.00 | 6 | 9.53 | 5 | 9.54 | 5 |
| Buy livestock | 22.84 | 3 | 8.00 | 4 | 23.13 | 3 | 23.16 | 3 |
| Pay for labour | 5.26 | 9 | 0.00 | 6 | 5.37 | 8 | 5.38 | 8 |
| Repay loans | 9.42 | 6 | 4.00 | 5 | 9.53 | 5 | 9.54 | 5 |
| Pay for the use of land | 0.51 | 15 | 0.00 | 6 | 0.52 | 12 | 0.52 | 12 |
| Pay for travel purposes | 1.78 | 14 | 0.00 | 6 | 1.82 | 11 | 1.82 | 11 |
| Pay taxes | 5.26 | 9 | 0.00 | 6 | 5.37 | 8 | 5.38 | 8 |
| Buy building materials | 3.90 | 10 | 4.00 | 5 | 3.90 | 9 | 3.90 | 9 |
| Pay for health expenses | 3.06 | 11 | 0.00 | 6 | 3.12 | 10 | 3.12 | 10 |
| Pay for education expenses | 5.86 | 8 | 4.00 | 5 | 5.89 | 7 | 5.90 | 7 |
| Feed shortage or drought | 2.04 | 13 | 0.00 | 6 | 2.08 | 11 | 2.08 | 11 |
| Labor shortage | 2.55 | 12 | 0.00 | 6 | 2.60 | 10 | 2.60 | 10 |
| Other reasons | 12.56 | 4 | 20.00 | 2 | 12.39 | 4 | 12.40 | 4 |
| Total | 100.00 | - | 100.00 | - | 100.00 | - | 100.00 | - |

N = Total number of respondents; HOUSEHOLDs = Households; n = Number of respondents; R = Rank

**Animal birth and death rates**

The birth and death rates of different animal types is presented in Table 3.3.98. The data shows birth rate is 45 percent in chickens, 14 -17 percent in goats and sheep, 11 percent in cattle and 1.63 percent in equines. Likewise, the death rate is higher in chickens (27 percent) followed by shoats (5.93 – 8.69 percent), cattle (2.48 percent) and equines (0.71 percent) in that order.

**Table 3.3. 98: The average birth and death of animals per household in the last 12 months (March 2017 – April 2018) in infant town and rural areas of Tigray (N = 5582 HOUSEHOLDs)**

| Animal type | Birth | Birth rate (%) | Death | Death rate (%) |
|---|---|---|---|---|
| Cattle | 0.355 | 11.02 | 0.080 | 2.48 |
| Oxen | - | - | 0.013 | 1.48 |
| Bulls | - | - | 0.010 | 0.93 |
| Cows | - | - | 0.015 | 1.81 |
| Heifer | - | - | 0.008 | 2.22 |
| Calves | - | - | 0.034 | 5.31 |
| Sheep | 0.182 | 14.00 | 0.113 | 8.69 |
| Goats | 0.369 | 17.66 | 0.124 | 5.93 |
| Donkeys | 0.016 | 1.63 | 0.007 | 0.71 |
| Horses | 0.000 | - | 0.000 | - |
| Mules | 0.000 | - | 0.000 | - |
| Camels | 0.000 | - | 0.000 | - |
| Chickens | 1.147 | 45.52 | 0.681 | 27.02 |
| Bee hives | 0.001 | 1.11 | 0.002 | 2.22 |
| Total | - | - | - | - |

N = Total number of respondents; HOUSEHOLDs = Households

***3.3.2.12. Animal feeds***

**Livestock feed resources**

Livestock feeds are the most concern for the livestock producers. Among livestock holders, more than 90 percent use crop residues as animal feeds (Table 3.3.99). This indicates that crop residues are the most important feed sources for livestock in the region. The type of crop residues produced at the farm level is determined by the type of crops cultivated in a given area. Residues of teff, wheat, barley, sorghum, maize and pulses are commonly used as animal feeds.

Hay and natural grazing are utilized by 56 and 34 percent of livestock producers, ranking as the second and third important feed sources, respectively following crop residues. The utilization of improved fodder (17 percent) and agro-industrial by-products (8 percent) is rare, limited to few farmers. Approximately 6 percent of them use other non-conventional feeds like cactus, mill byproducts, *Attela* and meal wastes.

**Table 3.3. 99: Common feeds utilized by households in Tigray region (N = 5582 HOUSEHOLDs)**

| Feed type | Regional | Infant town | Rural |
|---|---|---|---|
| Crop residues | 92.49 | 91.29 | 92.69 |
| Natural grazing | 34.38 | 39.01 | 33.64 |
| Hay | 55.82 | 62.42 | 54.77 |
| Green fodder | 16.75 | 19.12 | 16.37 |
| Industrial by-products | 7.61 | 15.86 | 6.30 |
| Other feeds | 6.04 | 10.14 | 5.38 |
| Total (N) | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households; n= Number of respondents

**Sources of feeds for livestock**

Farmers get different feed types from various sources. As shown in Table 3.3.100, crop residues are largely obtained from own holdings (59 percent of the respondents), purchased residues (7 percent) and other sources (2 percent). Similarly, natural grazing is substantially secured from communal grazing (97 percent) and also from private grazing (36 percent), purchased grazing (9 percent) and other sources (12 percent). Holders acquire hay from own holdings (60 percent), communal holdings (9 percent), purchased hay (6 percent) and other sources (3 percent).

**Table 3.3. 100: Source of animal feed as per the farmers of Tigray (N = 5582 HOUSEHOLDs)**

| Feed type | Source of feeds (% of HOUSEHOLDs) | | | |
|---|---|---|---|---|
| | Self-produced | Purchased | Communal source | Other source |
| Regional | | | | |
| Crop residues | 59.23 | 6.82 | 8.68 | 2.36 |
| Natural grazing | 96.87 | 8.86 | 36.01 | 11.99 |
| Hay | 59.95 | 5.71 | 8.89 | 3.31 |
| Green fodder | 98.05 | 7.38 | 29.52 | 9.73 |
| Industrial by-products | 27.53 | 99.06 | 6.82 | 1.18 |
| Other feeds | 97.95 | 20.18 | 7.12 | 3.56 |
| Infant town | | | | |
| Crop residues | 73.36 | 14.39 | 11.11 | 3.28 |
| Natural grazing | 96.33 | 13.33 | 42.67 | 15.33 |
| Hay | 78.13 | 9.58 | 12.29 | 4.38 |
| Green fodder | 98.14 | 12.93 | 53.06 | 4.76 |
| Industrial by-products | 27.87 | 99.95 | 6.56 | 0.82 |
| Other feeds | 97.36 | 20.51 | 7.69 | 2.56 |
| Rural | | | | |
| Crop residues | 57.01 | 5.63 | 8.29 | 2.22 |
| Natural grazing | 94.75 | 8.03 | 34.77 | 11.37 |
| Hay | 56.64 | 5.01 | 8.27 | 3.11 |
| Green fodder | 98.17 | 6.35 | 25.13 | 10.66 |
| Industrial by-products | 27.39 | 99.18 | 6.93 | 1.32 |
| Other feeds | 97.95 | 20.08 | 6.95 | 3.86 |

N = Total number of respondents; HOUSEHOLDs = Households

**Utilization of industrial by-products**

Approximately 10 percent of livestock households use agro-industrial by-products as animal feed source while the majorities (90 percent) have no practice of utilizing by-products as feed (Table 3.3.101). Use of byproducts is relatively more common in infant towns (16 percent) than that of rural areas (9 percent). This indicates that rural livestock producers of the region hardly use industrial by-products (wheat bran, wheat middling, oil seed cakes, brewery by-products and molasses). This could be attributed to the poor availability, high cost and less awareness of people.

**Table 3.3. 101: Percentage of rural households who utilize industrial by-products as animal feed source in Tigray region (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Use industrial by-products | Regional | Infant town | Rural |
|---|---|---|---|
| Yes | 10.03 | 16.25 | 9.04 |
| No | 89.97 | 83.75 | 90.96 |
| Total | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

**Utilization of improved fodder**

The survey result shows that cultivation of improved forage is limited to fewer farmers (only 2 percent) while the remaining 98 percent do not grow forage (Table 3.3.102). No more difference between infant towns and rural areas in this regard. This limited participation of farmers in forage production is linked with land shortage, poor access to forage seeds, poor awareness of farmers and other factors. The participating farmers grow improved fodder species like elephant grass, alfalfa, cowpea, lablab, luceana, sesbania, tree lucerne, pigeon pea and others. Of the forage producing farmers, about 84 percent started feeding improved fodder to their animals.

**Table 3.3. 102: Percentage of rural households who grow and use improved animal fodder in Tigray region (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Farmers grow improved fodder | Regional | Infant town | Rural |
|---|---|---|---|
| Yes | 1.84 | 1.82 | 1.85 |
| No | 98.16 | 98.18 | 98.15 |
| Total | 100.00 | 100.00 | 100.00 |
| Farmers started feeding improved fodder to animals | | | |
| Yes | 83.50 | 92.86 | 82.02 |
| No | 16.50 | 7.14 | 17.98 |
| Total | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

**Improved fodder growing type**

Table 3.3.103 summarizes the proportion of households growing different types of improved fodder in Tigray region. Among the forage growing households, approximately 32 percent grow lueceana, 21 percent elephant grass, 15 percent sesbania and 11 percent alfalfa. This shows that lueceana, elephant grass, sesbania and alfalfa are the most common fodder types, in that order, cultivated by households. It is not uncommon also to observe households growing other fodder types (pigeon pea, lablab, cow pea, vetch, buffel grass, Rhodes grass and others).

**Table 3.3. 103: Proportion of households growing different improved fodder types in Tigray (N= 103 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Forage type | Regional | Infant town | Rural |
|---|---|---|---|
| Lueceana | 32.04 | 21.43 | 33.71 |
| Sesbania | 15.53 | 7.14 | 16.85 |
| Pigeon pea | 0.97 | 7.14 | 0.00 |
| Lablab | 4.85 | 7.14 | 4.49 |
| Cow pea | 1.94 | 7.14 | 1.12 |
| Vetch | 5.83 | 7.14 | 5.62 |
| Alfalfa | 10.68 | 7.14 | 11.24 |
| Elephant grass | 21.36 | 21.43 | 21.35 |
| Rhodes grass | 0.97 | 0.00 | 1.12 |
| Buffel grass | 0.97 | 7.14 | 0.00 |
| Other | 4.85 | 7.14 | 4.49 |
| Total | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

**Ownership and size of grazing lands**

The ownership of private and communal grazing lands is presented in Table 3.3.104. As shown in the table, only 14 percent of the livestock owning households have private grazing lands while majority of them (86 percent) have no private grazing land. Likewise, about half of the farmers have access to communal grazing lands.

**Table 3.3. 104: Livestock households owing private and communal grazing in Tigray region (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Farmers having private grazing land | Regional | Infant town | Rural |
|---|---|---|---|
| Yes | 13.59 | 13.78 | 13.56 |
| No | 86.41 | 86.22 | 86.44 |
| Total | 100.00 | 100.00 | 100.00 |
| Farmers having communal grazing land | | | |
| Yes | 47.52 | 52.28 | 46.76 |
| No | 52.48 | 47.72 | 53.24 |
| Total | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Holders own an average of 0.022 hectares private grazing land (Table 3.3.105). The private grazing lands (0.022 ha/HOUSEHOLD) covers only 1.86 percent of the farm land (1.18 ha/HOUSEHOLD). Grazing land varies by place of residence with the highest in eastern zone (0.057 ha/HOUSEHOLD) followed by central zone (0.029 ha/HOUSEHOLD). The private grazing size ranges from nil to 3.75 hectares. The maximum grazing sizes seen in north west zone (3.75 ha/HOUSEHOLD) and western zone (2.50 ha/HOUSEHOLD) may belong to commercial livestock farmers.

**Table 3.3. 105: Average, minimum and maximum private grazing land holding size of farmers in Tigray region (N = 759 HOUSEHOLDs)**

| Grazing size (ha/HOUSEHOLD) | Regional | Infant town | Rural |
|---|---|---|---|
| Average | 0.022 | 0.024 | 0.021 |
| Minimum | 0.000 | 0.000 | 0.000 |
| Maximum | 3.750 | 3.750 | 2.000 |

N = Total number of respondents; HOUSEHOLDs = Households

Of the private grazing land owning households, approximately 40 percent own 0.00 – 0.25 ha, 56 percent 0.26 – 0.50 ha and 2.59 percent 0.60 – 1.00 ha. Only few farmers (1.29 percent) are having greater than one hectare grazing land (Table 3.3.106).

**Table 3.3. 106: Private grazing land holding size of farmers in Tigray region (N = 759 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Private grazing land holding size (ha/HOUSEHOLD) | Regional | Infant town | Rural |
|---|---|---|---|
| 0.00 – 0.25 | 39.87 | 38.00 | 40.10 |
| 0.26 – 0.50 | 56.25 | 54.00 | 56.52 |
| 0.60 – 1.00 | 2.59 | 4.00 | 2.42 |
| > 1.00 | 1.29 | 4.00 | 0.97 |
| Total | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

**Feed shortage and purchase**

Feed shortage is the key limiting factor for livestock producers. In this study, about 34 percent of the farmers face feed shortage for their animals (Table 3.3.107). The farmers cope up feed shortage through different mechanisms worth mentioning feed purchase, reducing animal number, searching alternative feeds like cactus and other means.

**Table 3.3. 107: Farmers who face feed shortage in Tigray region (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Farmers face feed shortage | Regional | Infant town | Rural |
|---|---|---|---|
| Yes | 34.30 | 32.51 | 34.59 |
| No | 65.70 | 67.49 | 65.41 |
| Total (N) | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

In an attempt to solve feed problem, farmers are forced to purchase feeds from markets. The survey result shows that about 34 percent of the rural livestock farmers purchase feed for their animals to solve feed shortage problem (Table 3.3.108). Feed purchase is more common in infant towns (41 percent) than that of rural areas (32 percent).

**Table 3.3. 108: Farmers who purchase animal feed to solve feed shortage in Tigray region (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Farmers buy animal feed | Regional | Infant town | Rural |
|---|---|---|---|
| Yes | 33.75 | 41.22 | 32.55 |
| No | 66.25 | 58.78 | 67.45 |
| Total (N) | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

***3.3.2.13. Livestock housing***

Housing is an important husbandry practice in livestock production system. Livestock producers practice different housing methods, depending on agro-ecology, farming system, climatic factors and availability of materials. Table 3.3.109 provides information on the different livestock housing systems being practiced in Tigray. As shown in the table, nearly 76 percent of the respondents house their animals in different methods while the remaining 24 percent put animals in open housing. More than half of the farmers confine their animals in paddocks, 19.40 percent put animals in shed and 18.88 percent use fences or collars. This as it is, about 13 percent of the holders confine animals inside home with family. It is not uncommon also to observe farmers (0.82 percent) confining animals in kitchen.

**Table 3.3. 109: Animal housing methods being practiced by farmers in Tigray region (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Animal housing methods | Regional | Infant town | Rural |
|---|---|---|---|
| No house (open housing) | 23.77 | 22.89 | 23.91 |
| Housed in shed | 19.40 | 16.78 | 19.82 |
| Housed in paddocks | 51.30 | 48.37 | 51.77 |
| Housed in fences or corals | 18.88 | 17.30 | 19.13 |
| Housed in basket | 1.83 | 3.38 | 1.58 |
| Housed inside the home (with family) | 13.61 | 15.60 | 13.29 |
| Housed in kitchen | 0.82 | 0.65 | 0.85 |
| Other (specify) | 1.52 | 2.47 | 1.37 |
| Total (N) | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

***3.3.2.14. Animal watering***

**Sources of drinking water for livestock**

Farmers get access to drinking water for animals from various sources (Table 3.3.110). The sources of drinking water vary with place and season. Rivers (51 percent), well (19 percent),

pump (18 percent) and bore hole (10 percent) are the major water sources during the dry season. Similarly, rivers/springs/streams (50 percent), surface water (12 percent) and pump (10 percent) are among the major water sources for animals during wet season.

**Table 3.3. 110: Sources of drinking water for animals in dry and wet seasons in Tigray region (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Source of water | Regional | | Infant town | | Rural | |
|---|---|---|---|---|---|---|
| | Dry season | Wet season | Dry season | Wet season | Dry season | Wet season |
| Bore hole | 10.49 | 8.44 | 11.61 | 5.46 | 10.31 | 8.91 |
| Dam/pond | 4.63 | 5.14 | 3.99 | 5.46 | 4.74 | 5.09 |
| Well | 18.78 | 3.71 | 24.78 | 3.25 | 17.82 | 3.78 |
| River/spring/stream | 50.88 | 50.06 | 36.40 | 48.63 | 53.20 | 50.29 |
| Rain water harvesting | 0.45 | 1.13 | 0.69 | 1.43 | 0.42 | 1.08 |
| Pump | 18.32 | 9.92 | 33.10 | 19.64 | 15.96 | 8.37 |
| Reservoir/Horeye | 1.67 | 7.47 | 0.87 | 4.03 | 1.80 | 8.02 |
| Surface water | 1.82 | 12.39 | 2.25 | 8.84 | 1.75 | 12.96 |
| Other source | 2.87 | 1.74 | 5.55 | 3.25 | 2.44 | 1.50 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

**Watering frequency of animals**

The watering frequency of animals during dry and wet seasons is presented in Table 3.3.111. The table shows that majority of the livestock farmers (59.43 percent) allow animals to have free access to drinking water. Approximately 33.05 percent of them allow once a day. Others allow their animals to have access to water twice a day (3.37 percent), once in two or more days (2.76percent) and three times a day (0.77 percent).

**Table 3.3. 111: Animal watering frequency in dry and wet seasons in Tigray region (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Watering frequency | Regional | | Infant town | | Rural | |
|---|---|---|---|---|---|---|
| | Dry season | Wet season | Dry season | Wet season | Dry season | Wet season |
| Free available | - | 59.43 | - | 63.46 | - | 58.79 |
| Once a day | - | 33.05 | - | 30.43 | - | 33.46 |
| Twice a day | - | 3.37 | - | 3.25 | - | 3.39 |
| Three times a day | - | 0.63 | - | 1.17 | - | 0.54 |
| Once in two or more days | - | 2.76 | - | 0.91 | - | 3.05 |
| Other | - | 0.77 | - | 0.78 | - | 0.77 |
| Total | - | 100.00 | - | 100.00 | - | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

**Payment for drinking water**

The livestock farmers were asked if they incur any cost for drinking water. The result shows that only 7.31 percent of the farmers pay for drinking water while the remaining 92.69 percent do no so (Table 3.3.112). The proportion of farmers paying for water is bigger during dry season (10.41 percent) than that of wet season (4.21 percent). Likewise, more holders pay in infant towns (13.91 percent) than rural areas (6.25 percent).

**Table 3.3. 112: Livestock farmers who incur expenses for watering animals in dry and wet seasons in Tigray region (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Farmers incur for animal watering | Regional | | | Infant town | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| | Dry season | Wet season | Over all | Dry season | Wet season | Over all | Dry season | Wet season | Over all |
| Yes | 10.41 | 4.21 | 7.31 | 20.29 | 7.54 | 13.91 | 8.83 | 3.68 | 6.25 |
| No | 89.59 | 95.79 | 92.69 | 79.71 | 92.46 | 86.09 | 91.17 | 96.32 | 93.75 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

The annual payment for drinking water is presented in Table 3.3.113. Livestock households pay an average of 17.85 Eth birr per annum for animal drinking water. The water payment is less in rural (16.23 Eth birr) than infant towns (27.98 Eth birr).

**Table 3.3. 113: Annual expenses for animal drinking water per household in Tigray region (N = 5582 HOUSEHOLDs) (Eth birr/HOUSEHOLD)**

| Water expense (Eth birr/HOUSEHOLD) | Regional | Infant town | Rural |
|---|---|---|---|
| Average | 17.850 | 27.980 | 16.233 |
| Minimum | 0.000 | 0.000 | 0.000 |
| Maximum | 21600.000 | 6000.000 | 21600.000 |

N = Total number of respondents; HOUSEHOLDs = Households

**Distance to water source**

The average, minimum and maximum distance travelled by animals to water point is presented in Table 3.3.114. On average, animals move 3.25 km to reach water point. More distance is travelled by animals in rural areas (3.33 km) as compared to that of infant towns (2.76 km). There is a condition to move animal more than 30 km to reach water source in areas like north western zone.

**Table 3.3. 114: Distance (km) travelled by animals to water source in Tigray region (N = 5582 HOUSEHOLDs)**

| Distance to water source (km) | Regional | Infant town | Rural |
|---|---|---|---|
| Average | 3.25 | 2.76 | 3.33 |
| Minimum | 0.00 | 0.00 | 0.00 |
| Maximum | 32.00 | 30.00 | 30.00 |

N = Total number of respondents; HOUSEHOLDs = Households

More than half of the households (52.21 percent) are expected to trek their animals less than one kilometer to reach water point. This as it is, 34.49 percent of them trek animals up to 5 km, 6.81 percent up to 10 km, 4.10 percent up to 20 km and 2.39 percent above 20 km (Table 3.3.115).

**Table 3.3. 115: Distance travelled by animals to water source in Tigray (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Distance to water source (km) | Regional | Infant town | Rural |
|---|---|---|---|
| 0.00 – 1.00 | 52.21 | 49.34 | 52.57 |
| 1.10 – 5.00 | 34.49 | 34.88 | 34.44 |
| 5.10 – 10.00 | 6.81 | 8.97 | 6.55 |
| 10.10 – 20.00 | 4.10 | 4.49 | 4.05 |
| > 20 | 2.39 | 2.33 | 2.39 |
| Total (N) | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

***3.3.2.15. Animal health***

**Livestock vaccination against common diseases**

The survey results show that about 72.57 percent of the livestock owning households reported their cattle had been vaccinated against at least one disease during the 12 months preceding the survey (Table 3.3.116). About 69 - 72 percent of the households made their sheep and goats to be vaccinated against common diseases. Likewise, 30.84 percent of the donkey owners reported vaccination. Vaccination is more common in infant towns than rural in all animal types.

**Table 3.3. 116: Animals vaccinated against common diseases in Tigray (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Animal type | Animals vaccinated against common diseases (% of HOUSEHOLDs) | | |
|---|---|---|---|
| | Regional | Infant town | Rural |
| Cattle | 71.57 | 79.49 | 70.36 |
| Sheep | 69.49 | 75.76 | 68.69 |
| Goats | 72.37 | 81.62 | 70.97 |
| Equine | 30.84 | 37.05 | 29.75 |
| Total | - | - | - |

N = Total number of respondents; HOUSEHOLDs = Households

Diseases have great impact on productivity of animals. In attempts to prevent diseases occurrence, animals are vaccinated periodically against common diseases. Cattle are vaccinated against anthrax, blacklegs, lumpy skin disease (LSD) and bovine pasteurellosis; sheep and goats against ovine pasteurellosis, PPR and sheep pox; and chickens against newcastle disease (NCD).

**Livestock treatment against external parasites**

Table 3.3.117 provides information on proportion of livestock households exposed their animals for spraying against external parasites. The data shows that 71 – 76 percent of the livestock holders made their livestock (cattle, sheep and goats) to be sprayed against external parasites in the past 12 months. Similarly, about 35.12 percent of the donkey owners did the same.

**Table 3.3. 117: Animals sprayed against external parasites in Tigray (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Animal type | Animals sprayed against external parasites (% of HOUSEHOLDs) | | |
|---|---|---|---|
| | Regional | Infant town | Rural |
| Cattle | 74.40 | 71.67 | 74.89 |
| Sheep | 76.10 | 68.60 | 77.12 |
| Goats | 71.70 | 67.94 | 72.35 |
| Equine | 35.12 | 34.07 | 35.32 |
| Total | - | - | - |

N = Total number of respondents; HOUSEHOLDs = Households

**Livestock treatment against internal parasites**

As shown in Table 3.3.118, farmers said their animals had been dewormed against internal parasites during the last 12 months preceding the survey; with 47.41 percent for cattle, 56.02 percent sheep, 54.15 percent goats and 28.69 percent donkeys.

**Table 3.3. 118: Animals dewormed against internal parasites in Tigray (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Animal type | Animals dewormed against internal parasites (% of HOUSEHOLDs) | | |
|---|---|---|---|
| | Regional | Infant town | Rural |
| Cattle | 47.41 | 44.33 | 47.96 |
| Sheep | 56.02 | 56.82 | 55.96 |
| Goats | 54.15 | 43.75 | 54.93 |
| Equine | 28.69 | 25.53 | 29.03 |
| Total | - | - | - |

N = Total number of respondents; HOUSEHOLDs = Households

Livestock holders made their animals to be dewormed at various intervals. About half of cattle holders (48 percent) reported deworming every 4 – 6 months, 33 percent every 3 months and 14

percent every 7 – 12 months. But, less than 5 percent of cattle holders said deworming every 12 months. The frequency of drenching for sheep, goats and donkeys is presented in Table 3.3.119.

**Table 3.3. 119: Frequency of animal deworming against internal parasites in Tigray (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Frequency of animal deworming | Regional | Infant town | Rural |
|---|---|---|---|
| Cattle | | | |
| Every 3 months | 32.40 | 35.75 | 31.83 |
| Every 4 - 6 months | 48.30 | 45.08 | 48.85 |
| Every 7 - 12 months | 14.24 | 16.06 | 13.93 |
| Every above 12 months | 5.05 | 3.11 | 5.38 |
| Sheep | | | |
| Every 3 months | 35.27 | 48.00 | 33.67 |
| Every 4 - 6 months | 48.21 | 42.00 | 48.99 |
| Every 7 - 12 months | 11.38 | 6.00 | 12.06 |
| Every above 12 months | 5.13 | 4.00 | 5.28 |
| Goats | | | |
| Every 3 months | 31.07 | 40.00 | 29.79 |
| Every 4 - 6 months | 49.43 | 38.18 | 51.04 |
| Every 7 - 12 months | 14.51 | 16.36 | 14.25 |
| Every above 12 months | 4.99 | 5.45 | 4.92 |
| Equines | | | |
| Every 3 months | 26.32 | 17.50 | 28.02 |
| Every 4 - 6 months | 38.87 | 40.00 | 38.65 |
| Every 7 - 12 months | 24.29 | 30.00 | 23.19 |
| Every above 12 months | 10.53 | 12.50 | 10.14 |

N = Total number of respondents; HOUSEHOLDs = Households

**Animal illness and death occurrence**

The animal illness and death occurrence in Tigray is presented in Table 3.3.120. As shown in the table, about 10 – 15 percent of the livestock households reported occurrence of illness on their animals (cattle, sheep and goats) during the 12 months preceding the survey. The illness occurrence on donkey was reported to be less (2 percent). Approximately 16 and 11 percent of the livestock farmers reported occurrence of death on goats and sheep, respectively during the referenced period. As per the farmers, less death occurs on cattle (5.31 percent) and equines (0.92 percent).

**Table 3.3. 120: Percent of households who faced animal illness and death in the past 12 months (March 2017- April 2018) in Tigray (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Animal type | Regional | Infant town | Rural |
|---|---|---|---|
| Animal illness occurrence (% of HOUSEHOLDs) | | | |
| Cattle | 10.95 | 15.87 | 10.27 |
| Sheep | 9.83 | 10.75 | 9.69 |
| Goats | 15.48 | 24.08 | 14.34 |
| Equine | 2.05 | 3.50 | 1.84 |
| Chickens | - | - | - |
| Animal death occurrence(% of HOUSEHOLDs) | | | |
| Cattle | 5.31 | 7.85 | 4.96 |
| Sheep | 10.75 | 9.68 | 10.92 |
| Goats | 15.73 | 23.04 | 14.76 |
| Equine | 0.92 | 1.59 | 0.83 |
| Chickens | - | - | - |

N = Total number of respondents; HOUSEHOLDs = Households

**Traditional animal medication practices**

The survey work shows that about 10.14 percent of the livestock holders medicate their animals using traditional practices while the remaining 90 percent use other medication options (Table 3.3.121). Among the farmers who practice traditional treatment, nearly 86.29 percent reported the traditional animal medication method to be effective.

**Table 3.3. 121: Percent of households who practice traditional animal medication and its effectiveness in Tigray (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Use traditional animal medication (% of HOUSEHOLDs) | Regional | Infant town | Rural |
|---|---|---|---|
| Yes | 10.14 | 8.88 | 10.37 |
| No | 89.86 | 91.12 | 89.63 |
| Total | 100.00 | 100.00 | 100.00 |
| Effectiveness of traditional animal medication | | | |
| Effective | 87.41 | 92.31 | 86.29 |
| Not effective | 12.59 | 7.69 | 13.71 |
| Total | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

***3.3.2.16. Animal breeding***

**Use of controlled breeding**

Table 3.3.122 presents data on proportion of livestock farmers who practice controlled animal breeding. As per the table, majority of the farmers (78.31 percent) practice free breeding while the remaining 21.69 percent practice controlled breeding. Controlled breeding is relatively more practiced in infant towns (27.70 percent) than rural areas (20.73 percent).

**Table 3.3. 122: Livestock farmers who practice controlled animal breeding method in Tigray (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Practicing controlled breeding | Practicing controlled animal breeding (% of HOUSEHOLDs) | | |
|---|---|---|---|
| | Regional | Infant town | Rural |
| Yes | 21.69 | 27.70 | 20.73 |
| No | 78.31 | 72.30 | 79.27 |
| Total | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

**Livestock breeding methods**

Livestock breeding methods that being practiced in Tigray is presented in Table 3.3.123. As mentioned above, about 22 percent of the livestock holders practice controlled animal breeding techniques. Of these farmers, more than 90 percent use natural mating in which majority (62.43 percent) select sire from own breeding herd/flock, 30.31 percent select sire from village or neighbor and 20.73 percent use purchased or exchanged sire. About 4.12 percent of holders use AI with higher in infant towns (7.52 percent) than urban holders (3.64 percent).

**Table 3.3. 123: Livestock breeding methods being practiced by farmers of Tigray (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Breeding methods | Regional | Infant town | Rural |
|---|---|---|---|
| Natural mating (sire selected from own herd/flock) | 62.43 | 56.81 | 63.63 |
| Natural mating (sire purchased or exchanged) | 20.73 | 24.88 | 19.84 |
| Natural mating (sire from village or neighbor) | 30.31 | 30.99 | 30.16 |
| Natural mating (non-breeding males castrated) | 2.48 | 1.88 | 2.61 |
| Natural mating (dam purchased) | 3.96 | 5.16 | 3.71 |
| Artificial insemination (AI) | 4.12 | 7.52 | 3.64 |
| Other breeding method | 2.06 | 4.69 | 1.50 |

N = Total number of respondents; HOUSEHOLDs = Households

**Payment for animal breeding**

The number and percent of livestock farmers who incur cost for livestock breeding is presented in Table 3.3.124. As shown on the table, most of the livestock farmers (97.60 percent) do not incur any cost for animal breeding while the rest 2.40 percent pay for livestock breeding. Comparatively, holders of infant towns (3.64 percent) pay more than that of rural holders (2.20 percent).

**Table 3.3. 124: Livestock farmers who incur cost for animal breeding/mating in Tigray (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Farmers pay for animal breeding | Regional | Infant town | Rural |
|---|---|---|---|
| Yes | 2.40 | 3.64 | 2.20 |
| No | 97.60 | 96.36 | 97.80 |
| Total | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

**Use of AI and farmers' satisfaction**

The data shows that out of the total livestock producers (N= 5583 HOUSEHOLDs) only 4 percent use AI as animal breeding method. Similarly, out of the cattle producers (N= 4840) about 4.11 percent use AI for breeding purpose. The perception of farmers on AI showed that about 67.84 percent of the AI users reported their satisfaction with AI while the remaining 32.16 percent reported not so (Table 3.3.125). AI is relatively more used in infant towns (7.51 percent) as compared to rural (3.64 percent).

**Table 3.3. 125: Cattle owning farmers who use AI as animal breeding method in Tigray (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Farmers use AI (% of HOUSEHOLDs) | Regional | Infant town | Rural |
|---|---|---|---|
| Yes | 4.11 | 7.51 | 3.64 |
| No | 95.89 | 92.49 | 96.36 |
| Total | 100.00 | 100.00 | 100.00 |
| Farmers' satisfaction with AI (% of HOUSEHOLDs) | | | |
| Yes | 67.84 | 65.91 | 68.39 |
| No | 32.16 | 34.09 | 31.61 |
| Total | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

***3.3.2.17. Dairy production***

**Participation of farmers in dairy farming**

The survey result shows that approximately 21.20 percent of the livestock producers are engaged in dairy farming (Table 3.3.126). Of these dairy producers, 87 percent are male producers and the rest 13 percent are female producers. Comparatively, dairy producers are slightly more in infant towns (23.28 percent) than rural (20.88 percent).

**Table 3.3. 126: Farmers who keep milking animals by sex in Tigray (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Farmers keep milking animals | Regional | | | Infant town | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| | Male | Female | Overall | Male | Female | Overall | Male | Female | Overall |
| Yes | 22.73 | 14.44 | 21.20 | 25.00 | 16.77 | 23.28 | 22.38 | 14.01 | 20.88 |
| No | 77.27 | 85.56 | 78.80 | 75.00 | 83.23 | 76.72 | 77.62 | 85.99 | 79.12 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

**Cow holding type**

The holding of different cow breeds among dairy producers is presented in Table 3.3.127. Among the dairy producers, nearly 90 percent practice dairying using local cows, 11 percent Begait cows, 7 percent exotic cows and 3 percent crossbred cows. Local cows are largely kept in rural (91.44 percent) than infant town (81.56 percent). On the other hand, exotic/crossbred cows are relatively more used in infant town than that of rural areas.

**Table 3.3. 127: Distribution of cow breeds among dairy producers in Tigray (N= 1184 HOUSEHOLDs) (% of HOUSEHOLDS)**

| Cow breeds | Regional | Infant town | Rural |
|---|---|---|---|
| Local cows | 89.95 | 81.56 | 91.44 |
| Begait cows | 11.32 | 17.88 | 10.15 |
| Exotic cows | 6.93 | 12.85 | 5.87 |
| Crossbred cows | 2.53 | 3.35 | 2.39 |
| Total | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Amongst the dairy producers owning local cows (N= 452 HOUSEHOLDs), more than 90.27 percent hold one cow, 8.19 percent two cows and below 2 percent three and above cows (Table 3.3.128).

**Table 3.3. 128: Number of exotic cows owned by dairy producers in Tigray (N= 1184 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Local cow number | Regional | Infant town | Rural |
|---|---|---|---|
| One cow | 90.27 | 100.00 | 89.216 |
| Two cows | 8.19 | 0.00 | 9.069 |
| Three cows | 0.88 | 0.00 | 0.980 |
| Above three cows | 0.66 | 0.00 | 0.735 |
| Total | 100.00 | 100.00 | 100.000 |

N = Total number of respondents; HOUSEHOLDs = Households

Amongst the dairy producers owning exotic cows, about 30 percent have one cow, 28 percent two cows and 33 percent three cows (Table 3.3.129). And less than 10 percent hold above three exotic cows.

**Table 3.3. 129: Number of exotic cows owned by dairy producers in Tigray (N= 1184 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Exotic cow number | Regional | Infant town | Rural |
|---|---|---|---|
| One cow | 30.49 | 19.23 | 35.71 |
| Two cows | 28.05 | 23.08 | 30.36 |
| Three cows | 32.93 | 42.31 | 28.57 |
| Above three cows | 8.54 | 15.38 | 5.36 |
| Total | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

**Milk production**

Table 3.3.130 presents information on average, maximum and minimum daily milk production of different cow breeds in Tigray. Average daily milk production is 1.13 liter for local cows, 6.82 liters Begait cows, 11.29 liters exotic cows and 8.24 liters crossbred cows.

**Table 3.3. 130: Average, maximum and minimum daily cattle milk production in Tigray (N = 1184 HOUSEHOLDs)**

| Cow breed | Regional | | | Infant town | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| | Ave | Min | Max | Ave | Min | Max | Ave | Min | Max |
| Local | 1.13 | 0.50 | 6.00 | 1.26 | 0.30 | 6.00 | 1.115 | 0.50 | 5.00 |
| Begait | 6.82 | 2.00 | 14.00 | 7.21 | 3.00 | 14.00 | 6.12 | 2.00 | 12.00 |
| Exotic | 11.29 | 4.00 | 36.00 | 12.68 | 4.00 | 36.00 | 10.08 | 4.00 | 24.00 |
| Crossbred | 8.24 | 3.50 | 21.00 | 8.86 | 4.00 | 21.00 | 8.14 | 3.50 | 15.00 |

N = Total number of respondents; HOUSEHOLDs = Households

***3.3.2.18. Poultry production***

**Participation of farmers in poultry production**

Among the livestock farmers, about 44.17 percent raise chicken; of which 82 percent are male producers and 18 percent female chicken producers (Table 3.3.131). The proportion of chicken producers is almost similar in both infant town (43.82 percent) and rural (44.23 percent).

**Table 3.3. 131: Households who raise chicken in Tigray by sex (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Farmers raise chicken | Regional | | | Infant town | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| | Male | Female | Overall | Male | Female | Overall | Male | Female | Overall |
| Yes | 43.88 | 45.45 | 44.17 | 43.09 | 46.58 | 43.82 | 44.00 | 45.24 | 44.23 |
| No | 56.12 | 54.55 | 55.83 | 56.91 | 53.42 | 56.18 | 56.00 | 54.76 | 55.77 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

**Hen holding types**

The survey result shows that majority of the poultry producers (68.37 percent) possess local chicken while 27.86 percent run poultry production using exotic/hybrid chicken breeds (Table 3.3.132). The proportion of local and exotic chicken holding is almost similar between rural and infant town.

**Table 3.3. 132: Distribution of chicken breeds among poultry producers in Tigray (N= 2466 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Chicken breeds | Regional | Infant town | Rural |
|---|---|---|---|
| Local chicken | 68.37 | 67.66 | 68.48 |
| Exotic/hybrid chicken | 27.86 | 28.19 | 27.81 |
| Total | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

**Hen holding size**

The average, minimum and maximum laying hen holding size of the chicken producers is presented in Table 3.3.133. Chicken producers, on average, hold 4.46 local hens and 7.36 exotic/hybrid hens. The holding is bigger in rural than infant town in both local and exotic.

**Table 3.3. 133: Average number of laying hens per household in Tigray region (N = 2466 HOUSEHOLDs)**

| Hen breed | Regional | Infant town | Rural |
|---|---|---|---|
| Local | 4.46 | 3.44 | 4.62 |
| Exotic/hybrid | 7.36 | 4.50 | 7.82 |
| Total | - | - | - |

N = Total number of respondents; HOUSEHOLDs = Households

**Clutch length**

The clutch length of local hen breeds ranges from 10 up to 32 days with average of 17.31 days (Table 3.3.134). Area does not have effect in clutch length of local hens.

**Table 3.3. 134: The average, minimum and maximum clutch length in days of local hens (days/head) in Tigray region (N = 2466 HOUSEHOLDs)**

| Hen breed | Regional | | | Infant town | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| | Ave | Min | Max | Ave | Min | Max | Ave | Min | Max |
| Local | 17.31 | 10 | 32 | 17.00 | 10 | 30 | 7.36 | 10 | 32 |
| Exotic/hybrid | - | - | - | - | - | - | - | - | - |

N = Total number of respondents; HOUSEHOLDs = Households

**Egg production per clutch**

Average egg production per clutch is 14.78 eggs/hen/clutch for local hens with minimum of 8 eggs/hen/clutch and maximum of 20 eggs/hen/clutch (Table 3.3.135). Egg production per clutch is comparative between rural and infant town.

**Table 3.3. 135: The average, minimum and maximum egg production per clutch of local hens (egg/hen/clutch) in Tigray region (N = 2466 HOUSEHOLDs)**

| Hen breed | Regional | | | Infant town | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| | Ave | Min | Max | Ave | Min | Max | Ave | Min | Max |
| Local | 14.78 | 8 | 20 | 13.50 | 8 | 30 | 14.99 | 6 | 30 |
| Exotic/hybrid | - | - | - | - | - | - | - | - | - |

N = Total number of respondents; HOUSEHOLDs = Households

**Egg production per annum**

The egg production per year for local and exotic/hybrid hens is presented in Table 3.3.136. Local hens produce an average of 56.21 eggs/hen/year, ranging 31 – 76 eggs/hen/year. The corresponding figure for exotic/hybrid hens is 250 eggs/hen/year (90 – 360 eggs/hen/year).

**Table 3.3. 136: The average, minimum and maximum annual egg production in year of local and exotic/hybrid hens (eggs/hen/year) in Tigray region (N = 2466 HOUSEHOLDs)**

| Hen breed | Regional | | | Infant town | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| | Ave | Min | Max | Ave | Min | Max | Ave | Min | Max |
| Local | 56.21 | 31.00 | 76.00 | 57.32 | 35.00 | 74.00 | 56.12 | 31.00 | 76.00 |
| Exotic/hybrid | 249.80 | 90.00 | 360.00 | 252.14 | 95.00 | 350.00 | 248.24 | 90.00 | 360.00 |

N = Total number of respondents; HOUSEHOLDs = Households

***3.3.2.19. Beehive products production***

**Participation of farmers in beekeeping**

Amongst the livestock households, approximately 6.50 percent practice beekeeping, while the remaining 93.50 percent do not so (Table 3.3.137). Out of these beekeepers, more than 90 percent are male beekeepers while female beekeepers account for about 8 percent. The proportion of beekeeper is bigger in rural (6.86 percent) than infant towns (4.29 percent).

**Table 3.3. 137: Rural households who practice beekeeping in Tigray by sex (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Farmers practice beekeeping | Regional | | | Infant town | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| | Male | Female | Overall | Male | Female | Overall | Male | Female | Overall |
| Yes | 7.34 | 2.81 | 6.50 | 5.10 | 1.24 | 4.29 | 7.69 | 3.10 | 6.86 |
| No | 92.66 | 97.19 | 93.50 | 94.90 | 98.76 | 95.71 | 92.31 | 96.90 | 93.14 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households; n = Number of respondents

**Beehive holding type**

Of the total beehive holders, nearly 76.58 percent of them possess traditional beehives while 22.87 percent of them own modern beehives (Table 3.3.138). The proportion of modern beehive holders is comparative between rural (23.03 percent) and infant town (21.21 percent).

**Table 3.3. 138: Beehive holding type amongst beekeepers in Tigray (N= 363 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Beehive type | Regional | Infant town | Rural |
|---|---|---|---|
| Traditional hive | 76.58 | 78.79 | 76.36 |
| Modern hive | 22.87 | 21.21 | 23.03 |
| Total | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

**Beehive holding size**

The survey result reveals that beekeepers hold an average of 2.38 traditional hives (ranging 0 – 40 hives) and 4.88 modern hives (ranging 0 – 200 hives) in the traditional and modern beekeeping production systems, respectively (Table 3.3.139).

**Table 3.3. 139: Average number of owned bee hives per household in Tigray region (N = 363 HOUSEHOLDs)**

| Beehive type | Regional | Infant town | Rural |
|---|---|---|---|
| Traditional hive | 2.38 | 3.11 | 2.30 |
| Modern hive | 4.88 | 2.56 | 5.07 |
| Total | - | - | - |

N = Total number of respondents; HOUSEHOLDs = Households

**Honey yield**

Average, minimum and maximum honey yield of traditional and modern beehives is presented in Table 3.3.140. As expected, beekeepers harvest more honey from modern hives (12.92 kg/hive/year) than that of traditional hives (6.84 kg/hive/year). The honey yield ranges 3 – 21 kg

for local hives and 5 – 30 kg modern hives. Modern hives out yield traditional hives by almost double.

**Table 3.3. 140: Average, minimum and maximum honey yield of traditional and local hives (kg/hive/year) in Tigray region (N = 363 HOUSEHOLDs)**

| Hive type | Regional | | | Infant town | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| | Ave | Min | Max | Ave | Min | Max | Ave | Min | Max |
| Traditional | 6.84 | 3.00 | 21.00 | 6.44 | 3.00 | 15.00 | 6.89 | 3.00 | 21.00 |
| Modern | 12.92 | 5.00 | 30.00 | 13.46 | 7.00 | 30.00 | 11.39 | 5.00 | 30.00 |
| Total | - | - | - | - | - | - | - | - | - |

N = Total number of respondents; HOUSEHOLDs = Households

In the traditional system, about 45 percent of the beekeepers harvest 1 – 4 kg honey per hive, 37 percent harvest 5 – 10 kg honey, 10 percent 11 – 15 kg honey and 14 percent 16 – 20 kg honey per hive (Table 3.3.141). Only one percent of the traditional hive holders harvest honey greater than 21 kg. In the modern beekeeping system, the beekeepers get 5 – 10 kg honey (35 percent), 11 – 15 kg (8 percent), 16 – 20 kg (5 percent), 21 – 25 kg (3 percent) and 26 – 30 kg (2 percent).

**Table 3.3. 141: Honey yield of traditional and local hives (kg/hive/year) in Tigray region (N = 363 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Honey yield (kg/hive/year) | Traditional hive | | Modern hive | |
|---|---|---|---|---|
| | Number of HOUSEHOLDs | Percent | Number of HOUSEHOLDs | Percent |
| 1- 4 | 84 | 45 | 0 | 0 |
| 5- 10 | 68 | 37 | 35 | 66 |
| 11 – 15 | 18 | 10 | 8 | 15 |
| 16 – 20 | 14 | 8 | 5 | 9 |
| 21 – 25 | 1 | 1 | 3 | 6 |
| 26 – 30 | 0 | 0 | 2 | 4 |
| > 30 | 0 | 0 | 0 | 0 |
| No response | 93 | - | 30 | - |
| Total | 278 | 100 | 83 | 100 |

N = Total number of respondents; HOUSEHOLDs = Households

**Frequency of honey harvesting**

Table 3.3.142 presents frequency of honey harvesting in traditional and modern beekeeping systems. The beekeepers harvest honey, on average, 1.43 (1 – 4) and 1.56 (1- 4) per annum for traditional and modern system, respectively.

**Table 3.3. 142: Average, minimum and maximum frequency of honey harvesting per annum in Tigray region (N = 363 HOUSEHOLDs)**

| Hive type | Regional | | | Infant town | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| | Ave | Min | Max | Ave | Min | Max | Ave | Min | Max |
| Traditional | 1.43 | 1 | 4 | 1.50 | 1 | 4 | 1.43 | 1 | 4 |
| Modern | 1.56 | 1 | 4 | 2.28 | 1 | 4 | 1.50 | 1 | 4 |
| Total | - | - | - | - | - | - | - | - | - |

N = Total number of respondents; HOUSEHOLDs = Households

Majority of the beekeepers (70 and 64 percent) harvest honey once a year and other beekeepers (22 and 25 percent) harvest twice a year in both traditional and modern systems, respectively (Table 3.3.143).

**Table 3.3. 143: Frequency of honey harvesting per annum in Tigray region (N = 363 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Frequency of honey harvesting | Regional | | Infant town | | Rural | |
|---|---|---|---|---|---|---|
| | Traditional hive | Modern hive | Traditional hive | Modern hive | Traditional hive | Modern hive |
| Once a year | 69.78 | 63.86 | 69.23 | 57.14 | 69.84 | 64.47 |
| Twice a year | 22.30 | 25.30 | 19.23 | 0.00 | 22.62 | 27.63 |
| Three times a year | 2.16 | 1.20 | 3.85 | 0.00 | 1.98 | 1.32 |
| Four times a year | 5.76 | 9.64 | 7.69 | 42.86 | 5.56 | 6.58 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

**Wax production**

Among the traditional beekeepers, about 22.66 percent harvest wax and the corresponding figure is 11.30 percent for modern beekeepers (Table 3.3.144).

**Table 3.3. 144: Farmers who harvested wax in the past 12 months (March 2017 – April 2018) in Tigray (N = 363 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Farmers harvest wax | Regional | | Infant town | | Rural | |
|---|---|---|---|---|---|---|
| | Traditional hive | Modern hive | Traditional hive | Modern hive | Traditional hive | Modern hive |
| Yes | 22.66 | 11.30 | 19.23 | 42.86 | 23.02 | 23.68 |
| No | 77.34 | 88.70 | 80.77 | 57.14 | 76.98 | 76.32 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

**Rearing new bee colony**

The proportion of beekeepers rearing new bee colony is presented in Table 3.3.145. As per the table, only 14.33 percent of beekeepers rear new honeybee colonies while majority (85.67 percent) do not practice queen rearing.

**Table 3.3. 145: Farmers who reared new bee colony in the past 12 months (March 2017 – April 2018) in Tigray (N = 363 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Farmers rear new bee colony | Regional | Infant town | Rural |
|---|---|---|---|
| Yes | 14.33 | 12.12 | 14.55 |
| No | 85.67 | 87.88 | 85.45 |
| Total | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

***3.3.2.20. Animal products utilization***

**Milk utilization**

As per the respondents, milk is used for various purposes. Most of the dairy producers (89.53 percent) utilize milk for home consumption, 44.51 percent for processing to milk products (making of cheese, butter and yoghurt) and others (7.52 percent) sell raw milk to get cash (Table 3.3.146). Milk sale is higher in infant towns (19.55 percent) than that of rural (5.37 percent).

**Table 3.3. 146: Utilization of milk in Tigray (N = 1184 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Milk use for | Regional | Infant town | Rural |
|---|---|---|---|
| Home consumption | 89.53 | 88.83 | 89.65 |
| Sale (market) | 7.52 | 19.55 | 5.37 |
| Processing (milk products) | 44.51 | 46.93 | 44.08 |
| Other uses | 5.07 | 3.91 | 5.27 |
| Total | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

The dairy producers were asked if they have the culture of selling raw milk to consumers and/or traders. Only few producers (6.33 percent) reported selling of raw milk during the 12 months preceding the survey (Table 3.3.147). As expected, milk sale practice is bigger in infant towns (18.99 percent) than rural areas (4.08 percent). This indicates that further efforts are required to link the producers with market to commercialize the dairy production system.

**Table 3.3. 147: Milk sale practice of sampled households in Tigray (N = 1184 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Farmers sell milk | Regional | Infant town | Rural |
|---|---|---|---|
| Yes | 6.33 | 18.99 | 4.08 |
| No | 93.67 | 81.01 | 95.92 |
| Total | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Similarly, about 15.79 percent of the dairy producers sell dairy products (cheese, butter and yoghurt) to market (Table 3.3.148). The milk product sale is bigger in infant towns (22.91 percent) than that of rural areas (14.53 percent).

**Table 3.3. 148: Milk products sale practice of sampled households in Tigray (N = 1184 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Farmers sell milk products | Regional | Infant town | Rural |
|---|---|---|---|
| Yes | 15.79 | 22.91 | 14.53 |
| No | 84.21 | 77.09 | 85.47 |
| Total | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

**Egg utilization**

As shown in Table 3.3.149, about 42.03 percent of the poultry producers use eggs for home consumption while 56.06 percent sell eggs to generate income to cover household expenses. Egg sale is bigger in rural areas (58.62 percent) than infant towns (39.88 percent). On the other hand, larger proportion of producers use eggs at home in infant towns (48.81 percent) as compared to rural producers (40.96 percent).

**Table 3.3. 149: Utilization of eggs of sampled households in Tigray (N = 2466 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Egg use for | Regional | Infant town | Rural |
|---|---|---|---|
| Home consumption | 42.03 | 48.81 | 40.96 |
| Sale (market) | 56.06 | 39.88 | 58.62 |
| Processing | 0.16 | 0.00 | 0.19 |
| Other use | 2.92 | 1.49 | 3.15 |
| Total | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

More than 50 percent of the poultry producers reported selling of eggs at market during the 12 months preceding the survey (Table 3.3.150). Egg sale is more common in rural areas (56.32 percent) than that of infant towns (39.76 percent).

**Table 3.3. 150: Egg sale practice of sampled households in Tigray (N = 2466 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Farmers sell egg | Regional | Infant town | Rural |
|---|---|---|---|
| Yes | 54.06 | 39.76 | 56.32 |
| No | 45.94 | 60.24 | 43.68 |
| Total (N) | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

**Hive products utilization**

According to the beekeepers, honey is utilized for home consumption (76.03 percent of the beekeepers), sale/income (54.27 percent), processing to other products like *Teji* making (0.55 percent) and other purposes like medicinal use (10.74 percent) (Table 3.3.151). Honey sale is more common in rural (55.15 percent) than infant towns (45.45 percent).

**Table 3.3. 151: Utilization of honey of sampled households in Tigray (N = 363 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Honey use for | Regional | Infant town | Rural |
|---|---|---|---|
| Home consumption | 76.03 | 81.82 | 75.45 |
| Sale (market) | 54.27 | 45.45 | 55.15 |
| Processing (tejj etc) | 0.55 | 0.00 | 0.61 |
| Other use | 10.74 | 12.12 | 10.61 |
| Total | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

As shown in Table 3.3.152, beekeepers use wax for different purpose; home consumption (44.63 percent of the respondents), sale/income (8.54 percent), processing to other products like candle making (3.58 percent) and other uses (50.41 percent).

**Table 3.3. 152: Utilization of wax of sampled households in Tigray (N = 363 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Wax use for | Regional | Infant town | Rural |
|---|---|---|---|
| Home consumption | 44.63 | 54.55 | 43.64 |
| Sale (market) | 8.54 | 6.06 | 8.79 |
| Processing (candle etc) | 3.58 | 3.03 | 3.64 |
| Other use | 50.41 | 39.39 | 51.52 |
| Total | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

The survey result shows that more than half of the beekeepers reported selling of honey during the 12 months preceding the survey (Table 3.3.153).

**Table 3.3. 153: Honey sale practice of sampled households in Tigray (N = 363 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Farmers sell honey | Regional | Infant town | Rural |
|---|---|---|---|
| Yes | 51.52 | 48.48 | 51.82 |
| No | 48.48 | 51.52 | 48.18 |
| Total | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Likewise, approximately 4.68 percent of the beekeepers reported selling of wax during the 12 months preceding the survey work (Table 3.3.154).

**Table 3.3. 154: Wax sale practice of sampled households in Tigray (N = 363 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Farmers sell wax | Regional | Infant town | Rural |
|---|---|---|---|
| Yes | 4.68 | 6.06 | 4.55 |
| No | 95.32 | 93.94 | 95.45 |
| Total | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

As shown in Table 3.3.155, only 4.41 percent of the beekeepers reported selling of new reared bee colony during the last year preceding the survey work.

**Table 3.3. 155: New bee colony sale practice of sampled households in Tigray (N = 363 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Farmers sell new bee colony | Regional | Infant town | Rural |
|---|---|---|---|
| Yes | 4.41 | 3.03 | 4.55 |
| No | 95.59 | 96.97 | 95.45 |
| Total | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

**Revenues from hive products**

The average revenue obtained from beehive products per household is presented in Table 3.3.156. On average, beekeepers fetch about 5343 Eth birr per annum from beehive products. The annual revenue belongs to honey sale (3164 birr, 60 percent), wax sale (994 birr, 18 percent) and colony sale (1185 birr, 22 percent).

**Table 3.3. 156: Average revenue obtained from sale of hive products per household in Tigray (N = 363 HOUSEHOLDs) (Eth birr)**

| Hive products | Regional | | Infant town | | Rural | |
|---|---|---|---|---|---|---|
| | Average | Percent | Average | Percent | Average | Percent |
| Honey | 3164 | 59.22 | 2990 | 63.08 | 3180 | 58.41 |
| Wax | 994 | 18.60 | 150 | 3.16 | 1107 | 20.33 |
| New bee colony | 1185 | 22.18 | 1600 | 33.76 | 1157 | 21.25 |
| Total | 5343 | 100.00 | 4740 | 100.00 | 5444 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

### *3.3.2.21. Livestock extension services*

The survey result highlights that livestock holders are engaged in different livestock extension packages such as poultry development (15.25 percent of the holders), animal fattening (12.45 percent), dairy development (9.06 percent), forage development (4.17 percent) and beekeeping development (2.60 percent) (Table 3.3.157). About 32.26 percent of the holders are involved in either of these packages.

**Table 3.3. 157: Participation of livestock households in animal extension packages (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Livestock extension service | Regional | | Infant town | | Rural | |
|---|---|---|---|---|---|---|
| | Yes | No | Yes | No | Yes | No |
| Dairy development | 9.06 | 90.94 | 11.31 | 88.69 | 8.68 | 91.32 |
| Fattening development | 12.45 | 87.55 | 13.13 | 86.87 | 12.30 | 87.70 |
| Poultry development | 15.25 | 84.75 | 11.83 | 88.17 | 15.72 | 84.28 |
| Beekeeping development | 2.60 | 97.40 | 1.43 | 98.57 | 2.70 | 97.30 |
| Forage development | 4.17 | 95.83 | 3.25 | 96.75 | 4.22 | 95.78 |
| Fish development | 1.18 | 98.82 | 1.04 | 98.96 | 1.08 | 98.92 |
| One or more of the above | 32.26 | 67.74 | 28.60 | 71.40 | 32.84 | 67.16 |

N = Total number of respondents; HOUSEHOLDs = Households

### *3.3.2.22. Expenditure for animal production*

**Expenses for animal purchase**

Average expenses for animal purchase in the past year preceding the survey work is presented in Table 3.3.158. On average, a livestock producer incurs 1296.38 Eth birr per annum for the purpose of animal purchases. Of the total annual expenses for animal purchase, about 67.06 percent is devoted for purchase of cattle (31.25 percent for oxen, 14.74 percent bulls and 17.10 percent cows), 7.59 percent goats, 11.36 percent sheep, 4.99 chickens and 3.89 percent donkeys.

**Table 3.3. 158: Average expenses for animal purchases per household in the last 12 months (March 2017 – April 2018) in Tigray (N = 5582 HOUSEHOLDs) (Eth birr)**

| Animal type | Regional | | Urban | | Infant town | | Rural | |
|---|---|---|---|---|---|---|---|---|
| | Expense | Percent | Expense | Percent | Expense | Percent | Expense | Percent |
| Cattle | 869.34 | 67.06 | 2633.54 | 58.54 | 1157.17 | 74.73 | 683.27 | 72.84 |
| Bull | 191.09 | 14.74 | 1291.00 | 28.70 | 204.00 | 13.17 | 89.90 | 9.58 |
| Oxen | 405.13 | 31.25 | 16.38 | 0.36 | 650.00 | 41.98 | 431.42 | 45.99 |
| Cows | 221.69 | 17.10 | 1248.33 | 27.75 | 240.00 | 15.50 | 126.78 | 13.52 |
| Heifer | 36.36 | 2.81 | 12.00 | 0.27 | 45.45 | 2.94 | 31.45 | 3.35 |
| Calves | 15.07 | 1.16 | 65.83 | 1.46 | 17.72 | 1.14 | 3.72 | 0.40 |
| Sheep | 147.22 | 11.36 | 1203.33 | 26.75 | 84.24 | 5.44 | 49.78 | 5.31 |
| Goats | 98.37 | 7.59 | 277.33 | 6.17 | 90.04 | 5.81 | 76.04 | 8.11 |
| Donkeys | 50.37 | 3.89 | 81.67 | 1.82 | 54.69 | 3.53 | 40.69 | 4.34 |
| Horses | 12.41 | 0.96 | 49.83 | 1.11 | 16.21 | 1.05 | 2.21 | 0.24 |
| Mules | 20.60 | 1.59 | 26.83 | 0.60 | 27.07 | 1.75 | 13.07 | 1.39 |
| Camels | 30.89 | 2.38 | 0.00 | 0.00 | 40.53 | 2.62 | 26.53 | 2.83 |
| Chickens | 64.73 | 4.99 | 221.50 | 4.92 | 69.2 | 4.47 | 44.31 | 4.72 |
| Bee hive | 2.45 | 0.19 | 3.83 | 0.09 | 9.33 | 0.60 | 2.12 | 0.23 |
| Total | 1296.38 | 100.00 | 4497.86 | 100.00 | 1548.48 | 100.00 | 938.02 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

**Expenses for livestock activities**

As shown in Table 3.3.159, about 37.52 percent of the livestock producers pay cost for any of livestock activities; feeding, watering, breeding, medication, transporting and the like. Livestock expense is more common in urban (73.01 percent), infant town (43.17 percent) and rural (33.10 percent) in that order.

**Table 3.3. 159: Farmers who incurred expenses for livestock production in the past 12 months (March 2017 – April 2018) in Tigray (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)**

| Farmers incur expenses for animal production | Regional | Urban | Infant town | Rural |
|---|---|---|---|---|
| Yes | 37.52 | 73.01 | 43.17 | 33.10 |
| No | 62.48 | 26.99 | 56.83 | 66.90 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Regionally, households incur an average of 1247.25 Eth birr annually (Table 3.3.160). Feed cost (776.53 Eth birr/HOUSEHOLD/year) accounts for about 62.26 percent of the total livestock production expenses followed by labor cost (254.36 Eth birr/HOUSEHOLD/year, 20.39 percent) and animal medication costs (103.41 Eth birr/HOUSEHOLD/year, 8.29 percent). Drinking water costs (75.14 Eth birr/HOUSEHOLD/year) and other expenses (37.81 Eth birr/HOUSEHOLD/year) cover only 6 and 3 percent of the total production costs, respectively. Expenses are bigger in urban (8785 Eth birr) than infant town (1391 Eth birr) and rural (440 Eth birr).

**Table 3.3. 160: Average annual expenses for animal production in the past 12 months (March 2017 – April 2018) in Tigray (N = 5582 HOUSEHOLDs) (Eth birr)**

| Kind of expenses | Regional | | Urban | | Infant town | | Rural | |
|---|---|---|---|---|---|---|---|---|
| | Expense | % | Expense | % | Expense | % | Expense | % |
| Labor/herding | 254.36 | 20.39 | 1111 | 12.65 | 673.70 | 48.42 | 78.88 | 17.93 |
| Feed purchase | 776.53 | 62.26 | 6715 | 76.44 | 400.75 | 28.80 | 241.23 | 54.83 |
| Animal medication | 103.41 | 8.29 | 260 | 2.96 | 183.35 | 13.18 | 71.05 | 16.15 |
| Water | 75.14 | 6.02 | 649 | 7.39 | 77.46 | 5.57 | 15.76 | 3.58 |
| Other expenses | 37.81 | 3.03 | 50 | 0.57 | 56.00 | 4.03 | 33.08 | 7.52 |
| Total | 1247.25 | 100.00 | 8785 | 100.00 | 1391.26 | 100.00 | 440.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

### *3.3.2.23. Revenues from livestock production*

**Revenues from live animal sales**

Table 3.3.161 presents annual average revenues obtained from sale of live animals per household in Tigray. At regional level, livestock producers fetch about 3487.03 Eth birr per annum from sales of live animals. The higher revenue is come from cattle (1504.19 Eth birr, 43.14 percent), sheep (226.12 Eth birr, 6.48 percent), goats (147.90 Eth birr, 4.24 percent), and chickens (66.77 Eth birr, 2 percent) in that order. Animal sale income is bigger in urban (11404 Eth birr) than infant town (1836 Eth birr) and rural (1070 Eth birr).

**Table 3.3. 161: Average revenues from sale of animals per household in the last 12 months (March 2017 – April 2018) in Tigray (N = 5582 HOUSEHOLDs) (Eth birr)**

| Animal type | Regional | | Urban | | Infant town | | Rural | |
|---|---|---|---|---|---|---|---|---|
| | Revenue | Percent | Revenue | Percent | Revenue | Percent | Revenue | Percent |
| Cattle | 1504.19 | 43.14 | 8980.00 | 78.74 | 1334.31 | 72.66 | 788.89 | 73.69 |
| Oxen | 472.43 | 13.55 | 3542.00 | 31.06 | 332.51 | 18.11 | 189.94 | 17.74 |
| Bull | 618.33 | 17.73 | 3329.00 | 29.19 | 504.81 | 27.49 | 367.26 | 34.30 |
| Cows | 354.67 | 10.17 | 1875.00 | 16.44 | 396.22 | 21.58 | 197.04 | 18.40 |
| Heifer | 39.86 | 1.14 | 92.00 | 0.81 | 95.57 | 5.20 | 25.78 | 2.41 |
| Calves | 18.90 | 0.54 | 142.00 | 1.25 | 5.20 | 0.28 | 8.87 | 0.83 |
| Sheep | 226.12 | 6.48 | 1850.00 | 16.22 | 133.55 | 7.27 | 79.63 | 7.44 |
| Goats | 147.90 | 4.24 | 95.00 | 0.83 | 311.19 | 16.95 | 127.07 | 11.87 |
| Donkeys | 24.40 | 0.70 | 198.00 | 1.74 | 24.18 | 1.32 | 7.18 | 0.67 |
| Horses | 7.10 | 0.20 | 90.00 | 0.79 | 0.00 | 0.00 | 0.00 | 0.00 |
| Mules | 1.32 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 1.66 | 0.16 |
| Camels | 4.12 | 0.12 | 0.00 | 0.00 | 0.00 | 0.00 | 5.19 | 0.48 |
| Chickens | 66.77 | 1.91 | 189.00 | 1.66 | 33.08 | 1.80 | 60.01 | 5.61 |
| Pigs | 0.16 | 0.00 | 2.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 |
| Bee hive | 0.77 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.97 | 0.09 |
| Total | 3487.03 | 100.00 | 11404.00 | 100.00 | 1836.31 | 100.00 | 1070.60 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

**Revenues from animal products sale**

On average households get about 1201.78 Eth birr from sale of different animal products (Table 3.3.162). The biggest share comes from milk (410.65 Eth birr, accounting for about 34.17 percent) and milk products (379.47 Eth birr, 31.58 percent) followed by eggs (137.96 Eth birr, 1.48 percent) and honey (105.85 Eth birr, 8.81 percent). This indicates that milk, milk products, eggs and honey are the main income sources for livestock holders. Milk and milk products together fetch more than 65 percent of the total annual revenues. This implies that dairying is an important business in the region.

**Table 3.3. 162: Average annual revenues obtained from sale of various animal products in the past 12 months (March 2017 – April 2018) in Tigray (N = 5582 HOUSEHOLDs) (Eth birr)**

| Type of animal product | Regional | | Urban | | Infant town | | Rural | |
|---|---|---|---|---|---|---|---|---|
| | Revenue | % | Revenue | % | Revenue | % | Revenue | % |
| Meat | 99.59 | 8.29 | 1091.68 | 14.17 | 41.00 | 2.30 | 10.42 | 2.43 |
| Milk | 410.65 | 34.17 | 3749.52 | 48.67 | 820.29 | 46.09 | 72.00 | 16.78 |
| Milk products | 379.47 | 31.58 | 1633.28 | 21.20 | 184.39 | 10.36 | 128.04 | 29.85 |
| Eggs | 137.96 | 11.48 | 776.27 | 10.08 | 560.00 | 31.46 | 72.00 | 16.78 |
| Honey | 105.85 | 8.81 | 104.07 | 1.35 | 132.00 | 7.42 | 102.00 | 23.78 |
| Wax | 2.78 | 0.23 | 0.00 | 0.00 | 3.02 | 0.17 | 3.02 | 0.70 |
| Bee colony | 3.12 | 0.26 | 0.00 | 0.00 | 0.00 | 0.00 | 3.92 | 0.91 |
| Hides and skins | 34.94 | 2.91 | 3.89 | 0.05 | 37.60 | 2.11 | 37.60 | 8.76 |
| Manure | 7.08 | 0.59 | 89.20 | 1.16 | 0.40 | 0.02 | 0.00 | 0.00 |
| Animal dung | 0.77 | 0.06 | 7.85 | 0.10 | 1.20 | 0.07 | 0.00 | 0.00 |
| Other product | 19.58 | 1.63 | 248.24 | 3.22 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 1201.78 | 100.00 | 7704.00 | 100.00 | 1779.90 | 100.00 | 429.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

***3.3.2.24. Income from livestock production***

Regionally, livestock households incur about 2543.63 Eth birr for both animal purchases (1296.38 Eth birr) and livestock activities (1247.25 Eth birr), each accounting about half percent of the total households' expenses (Table 3.3.163). Expenses for animal activities is bigger in urban (66.14 percent) than that of infant town (47.33 percent) and rural (31.93 percent).

**Table 3.3. 163: Total annual expenses for animal production activities in the past 12 months (March 2017 – April 2018) in Tigray (N = 5582 HOUSEHOLDs) (Eth birr)**

| Kind of expenses | Regional | | Urban | | Infant town | | Rural | |
|---|---|---|---|---|---|---|---|---|
| | Expense | % | Expense | % | Expense | % | Expense | % |
| Animal purchase | 1296.38 | 50.97 | 4497.86 | 33.86 | 1548.48 | 52.67 | 938.02 | 68.07 |
| Animal activities | 1247.25 | 49.03 | 8785.00 | 66.14 | 1391.26 | 47.33 | 440.00 | 31.93 |
| Total | 2543.63 | 100.00 | 13282.86 | 100.00 | 2939.74 | 100.00 | 1378.02 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

The total revenue from livestock production is presented in Table 3.3.164. On average, households fetch about 4688.81 Eth birr which is attributed to animal sales (3487.03 Eth birr, accounting for about 74.37 percent) and animal products sales (1201.78 Eth birr, 25.63 percent). Revenue from animal sale is bigger than animal products sale in both urban and rural.

**Table 3.3. 164: Total annual revenues from animal production activities in the past 12 months (March 2017 – April 2018) in Tigray (N = 5582 HOUSEHOLDs) (Eth birr)**

| Kind of revenues | Regional | | Urban | | Infant town | | Rural | |
|---|---|---|---|---|---|---|---|---|
| | Revenue | % | Revenue | % | Revenue | % | Revenue | % |
| Animal sale | 3487.03 | 74.37 | 11404.00 | 59.68 | 1836.31 | 50.78 | 1070.60 | 71.39 |
| Animal products sale | 1201.78 | 25.63 | 7704.00 | 40.32 | 1779.90 | 49.22 | 429.00 | 28.61 |
| Total | 4688.81 | 100.00 | 19108.00 | 100.00 | 3616.21 | 100.00 | 1499.60 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Table 3.3.165 summarizes average income obtained from livestock production. As shown in the table, livestock households get an average of 2145.18 Eth birr from livestock production. The income is higher in urban (5825.14 Eth birr) than infant town (676.47 percent) and rural (121.58 Eth birr).

**Table 3.3. 165: Average annual income obtained from livestock production in the past 12 months (March 2017 – April 2018) in Tigray (N = 5582 HOUSEHOLDs) (Eth birr)**

| Variable | Regional | Urban | Infant town | Rural |
|---|---|---|---|---|
| Total expenses | 2543.63 | 13282.86 | 2939.74 | 1378.02 |
| Total revenue | 4688.81 | 19108.00 | 3616.21 | 1499.60 |
| Total income | 2145.18 | 5825.14 | 676.47 | 121.58 |

N = Total number of respondents; HOUSEHOLDs = Households

## 3.4. Employment opportunities, income sources and household consumption expenditures of surveyed households

### 3.4.1 Employment opportunities

Consistent with main objective of poverty estimation, the study adopted the World BankLiving Standards Measurement Study: Household Survey Questionnaires for Developing Countries. Employment and occupational classifications were designed accordingly, which are different from the United Nations Industrial Development Organization's (UNIDO) and International Labor Organization's (ILO) International Standard Industrial Classification (ISIC) of all economic activities. Hence, all tables and summary statistics are presented following the World Bank approach. Out of the total 4170 urban population households sampled in this study, it was found that 2790 people (household members) were found to be employed and 2133 of them engaged in paid employment (Table 3.4.1).

The study also enquired about the socio-economic activities of the sampled households in the region. Accordingly, respondents were asked to mention their level of income diversification. Income diversification is defined in terms of the number of income sources each householdhave access or number household members participate in income generating activities[3]. A household is said to have high income diversification, if it managed to increase its income sources (have different income sources) or if it has more household members participate in income generating activities, regardless of the diversity of the sources of income[4].

A household is said to be a participant in any job, if the head of the household or member of the household participate in any income generating activity (employed or self-employed) the household is said to be considered as active economic activity participant. Out of the total 12,316 sampled households (at the regional level), as can be seen from Table 3.4.2, 95% of the household members reported (including self-employed in agriculture and other sectors), at least to have one or more than one job (activity) by any member of the household. Moreover, 33% of

[3]A household or member of a household can have x number of different income generating or N number of household members can in 1 type of income generating activity.

[4] This is a working definition we have adopted, which differ slightly from Reardon, T., C. Delgado, and P. Matlon. 1992. Determinants and effects of income diversification amongst farm households in Burkina Faso. Journal of Development Studies, 28 (January1992), pp. 264-296.

sampled households reported to have engaged in more than one activity. However, 4.8 of the sampled households them reported none of the members to have no job. When we compare urban and rural areas in terms of job diversification no significant difference was observed.

**Table 3.4. 1:** Employed population of urban areas aged ten years and above by status in employment, bygender

| Region | total employed persons | total paid employees | Employee Government | employee Private Organization | Employee NGO | employee Domestic | Other Employee | members of cooperatives | self-employed | unpaid family worker | employer | apprentice | others |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Male | 1829 | 1375 | - | - | - | 62 | - | | | | | 17 | 375 |
| Female | 961 | 758 | - | - | - | 47 | 2 | | | | | 9 | 145 |
| Total | 2790 | 2133 | - | - | - | 109 | 2 | | | | | 26 | 520 |

As we can observe from the table below, we do not see substantial difference in household income diversification between urban and rural dwellers. The reason is that, the inclusion of agriculture[5], especially in the rural area has definitely exaggerated the number of people participating in income earning activities.

**Table 3.4. 2: Household Income diversification by place of residence[6]**

| | Regional | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| Income diversification | Freq. | Percent | Cum. | Freq. | Percent | Cum. | Freq. | Percent | Cum. |
| 0 | 588 | 4.77 | 4.77 | 383 | 6.54 | 6.54 | 205 | 3.17 | 3.17 |
| 1 | 7,643 | 62.06 | 66.83 | 3,388 | 57.85 | 64.38 | 4,255 | 65.88 | 69.05 |
| 2 | 3,119 | 25.32 | 92.16 | 1,552 | 26.50 | 90.88 | 1,567 | 24.26 | 93.31 |
| 3 | 713 | 5.79 | 97.95 | 393 | 6.71 | 97.59 | 320 | 4.95 | 98.27 |
| 4 | 199 | 1.62 | 99.56 | 105 | 1.79 | 99.39 | 94 | 1.46 | 99.72 |
| 5 | 32 | 0.26 | 99.82 | 25 | 0.43 | 99.81 | 7 | 0.11 | 99.83 |
| 6 | 18 | 0.15 | 99.97 | 10 | 0.17 | 99.98 | 8 | 0.12 | 99.95 |
| 7 | 3 | 0.02 | 99.99 | 1 | 0.02 | - | 2 | 0.03 | 99.98 |
| 8 | 1 | 0.01 | 100.00 | - | - | - | 1 | 0.02 | - |
| Total | 12,316 | 100.00 | | 5,857 | 100.00 | 100.00 | 6,459 | 100.00 | 100.00 |

When we compare the level of income diversification between male and female heads of households the number of households without any means of livelihood is almost more than 3 times (12 percent) than their male counterparts (5 percent).

[5] For instance, if a given household has 6 adult and all of them participate in the farm activities of the household, then the household is considered to have income diversification level of 6.

[6] Weighted and un-weighted gave the same result

**Table 3.4. 3:** Household Income diversification by gender

| | Regional | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| Income diversification | Freq. | Percent | Cum. | Freq. | Percent | Cum. | Freq. | Percent | Cum. |
| 0 | 588 | 4.77 | 4.77 | 110 | 1.34 | 1.34 | 478 | 11.57 | 11.57 |
| 1 | 7,643 | 62.06 | 66.83 | 4,898 | 59.86 | 61.20 | 2,745 | 66.42 | 77.98 |
| 2 | 3,119 | 25.32 | 92.16 | 2,432 | 29.72 | 90.92 | 687 | 16.62 | 94.60 |
| 3 | 713 | 5.79 | 97.95 | 547 | 6.68 | 97.60 | 166 | 4.02 | 98.62 |
| 4 | 199 | 1.62 | 99.56 | 153 | 1.87 | 99.47 | 46 | 1.11 | 99.73 |
| 5 | 32 | 0.26 | 99.82 | 22 | 0.27 | 99.74 | 10 | 0.24 | 99.98 |
| 6 | 18 | 0.15 | 99.97 | 18 | 0.22 | 99.96 | | | |
| 7 | 3 | 0.02 | 99.99 | 2 | 0.02 | 99.99 | 1 | 0.02 | 100.00 |
| 8 | 1 | 0.01 | 100.00 | 1 | 0.01 | 100.00 | | | |
| Total | 12,316 | 100.00 | | 8,183 | 100.00 | | 4,133 | 100.00 | |

In addition to number of jobs income sources and number of members participate in economic activities, the survey also collected the type of occupational category of urban household heads (rural questionnaire do not include this section) or members of the households participate. As shown in Table 3.4.4 below, out of the total (urban household) sample units were found to depend on professional 28%, followed by unskilled workers and others 19% (temporary and other miscellaneous activities).

**Table 3.4. 4:** Household members participation by occupational c**ategories**: by place of residence

| Fm1_occupation | Family member 1 | | | Family member 2 | | | Family member 3 | | | Family member 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Freq. | % | Cum. | Freq. | % | Cum. | Freq. | % | Cum. | Freq. | % | Cum. |
| professional /technical | 590 | 28.91 | 28.91 | 131 | 24.39 | 24.77 | 38 | 28.15 | 28.89 | 16 | 31.37 | 31.37 |
| administrative /manager | 93 | 4.56 | 33.46 | 21 | 3.91 | 28.68 | 2 | 1.48 | 30.37 | 1 | 1.96 | 33.33 |
| clerical | 44 | 2.16 | 35.62 | 26 | 4.84 | 33.52 | 6 | 4.44 | 34.81 | 4 | 7.84 | 41.17 |
| sales worker | 71 | 3.48 | 39.10 | 34 | 6.33 | 39.85 | 3 | 2.22 | 37.04 | 3 | 5.88 | 47.05 |
| supervisor/foreman | 83 | 4.07 | 43.17 | 17 | 3.17 | 43.02 | 6 | 4.44 | 41.48 | | | |
| technician | 45 | 2.20 | 45.37 | 16 | 2.98 | 46.00 | 4 | 2.96 | 44.44 | 4 | 7.84 | 54.89 |
| equipment maintance skilled production | 18 | 0.88 | 46.25 | 3 | 0.56 | 46.55 | 5 | 3.70 | 48.15 | 3 | 5.88 | 60.77 |
| unskilled production worker | 506 | 24.79 | 71.04 | 116 | 21.60 | 68.16 | 34 | 25.19 | 73.33 | 7 | 13.73 | 74.5 |
| other supportive service | 126 | 6.17 | 77.22 | 30 | 5.59 | 73.74 | 6 | 4.44 | 77.78 | 1 | 1.96 | 76.46 |
| apprentice/trainee | 15 | 0.73 | 77.95 | 6 | 1.12 | 74.86 | 2 | 1.48 | 79.26 | 1 | 1.96 | 78.42 |
| domestic skills/cooking | 61 | 2.99 | 80.94 | 29 | 5.40 | 80.26 | 8 | 5.93 | 85.19 | 2 | 3.92 | 82.34 |
| other specify | 389 | 19.06 | 100 | 106 | 19.74 | 100 | 20 | 14.81 | 100 | 9 | 17.64 | 100 |
| Total | 2,041 | 100 | | 537 | 100 | | 135 | 100 | | 51 | 100 | |

**Table 3.4. 5:** Household members participation by occupational c**ategories**: by place of residence

| | Family member 5 | | | Family member 6 | | | Family member 7 | | | Family member 8 | | | Regional | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Freq. | % | Cum. | Freq. | % | Cum. | Freq. | % | Cum. | Freq. | % | Cum. | Freq. | % |
| professional /technical | 8 | 33.33 | 33.33 | 2 | 28.57 | 28.57 | | | | | | | 785 | 28 |
| administrative /manager | 1 | 4.17 | 37.5 | | | | | | | | | | 118 | 4,2 |
| clerical | 1 | 4.17 | 41.67 | | | | | | | | | | 81 | 3.0 |
| sales worker | 1 | 4.17 | 45.84 | | | | | | | | | | 112 | 4.0 |
| supervisor/foreman | | | | | | | | | | | | | 106 | 3.8 |
| technician | | | | | | | | | | | | | 69 | 2.5 |
| equipment maintance skilled production | | | | | | | | | | | | | 29 | 1.0 |
| unskilled production worker | 2 | 8.33 | 54.17 | 1 | 14.29 | 42.86 | 1 | 25.00 | 25 | | | | 667 | 23.8 |
| other supportive service | 3 | 12.50 | 66.67 | | | | | | | | | | 166 | 5.9 |
| apprentice/trainee | | | | | | | | | | | | | 24 | 0.9 |
| domestic skills/cooking | 4 | 16.67 | 83.34 | 1 | 14.29 | 57.14 | 3 | 75.00 | 100 | 1 | 100 | 100 | 109 | 3.9 |
| other specify | 4 | 16.67 | 100 | 3 | 42.86 | 100 | | | | | | | 531 | 19.0 |
| Total | 24 | 100 | | 7 | 100 | | 4 | 100 | | 1 | 100 | | 2790 | 100 |

### 3.4.2 Household income sources

Household income is the sum total of monetary income and income "in kind". Household income consists of receipts, which are received regularly by the household or by individual members at annual or more frequent intervals. According to our survey result, respondents have revealed that, they draw their income from different sources: employment wage, business (both petty trade and medium and large scale), remittance, pension, agricultural and other incomes. Based on survey results, most households (95%) had at least one income source: 62% had one source, 25.3% had two income sources while 5.8% had three and above sources (Table 3.4. 2). In terms number of people participating in each income source 40% and 36.8% reported to draw their income from agriculture and wage income respectively

As we can observe, the household income survey data seems to suffer from serious missing data; mainly people naturally do not want to reveal their full income as well as due to routine survey problems. Moreover, due to the lack of refined household list at the regional, and woreda level we do not clam all households had equal probability for selection, thence perfect simple random sampling could not exercised. As a result we suspect minor problem of oversampling and under sampling in our sampling process. As explained in the methodology section, a weight has been used for estimation of population means in the descriptive statistics and in the regression estimation. However, against our suspicion our weighted and unweighted results do not show significant difference, hence in this section we simply reported the unweighted ones.

Given these background situations the average household income(Table 3.4.6), censoring income per annum report below birr 1000 and above birr 500,000 responses, the regional average income was found to Birr 25365 and the average per adult income birr 6855 (given an average adult equivalent of 3.7). When we compare the average household income across place of residences it does not reveal substantial difference as expected between urban and rural on one hand and male female on the other hand.

As can be seen from, (Table 3.4.8), 4495 of the households (36.5 percent) reportedto have zero income, which is very far from reality. Moreover, when include households who report income below birr 1000 (1097 households) accounting 8.9% of the total sample, we will be left with

54.6% of the total samples. This shows that the income survey result, apart from indicative, it cannot be used for serious analysis and draw any sort of conclusions and recommendations. In view of the under reporting and excessive missing data, observed in household income data the interpretation should be with caution. As a result household income cannot be used for poverty analysis and instead consumption expenditure will be used for poverty analysis.

**Table 3.4. 6:** Income sources: Regional, urban and rural[7]

| Variable | Regional | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Wage income | 2730 | 41700 | 1486 | 2273 | 24682 | 953 | 457 | 126343 | 6134 |
| Business income | 671 | 9129 | 818 | 529 | 10019 | 1012 | 142 | 5812 | 806 |
| Income from Household Female Petty Businesses | 84 | 7371 | 2357 | 84 | 7371 | 2357 | - | - | - |
| Income from Underage Children | 9 | 8735 | 6255 | 4 | 17555 | 13709 | 5 | 1680 | 333 |
| Income from Remittances | 760 | 5976 | 447 | 317 | 4666 | 470 | 443 | 6914 | 686 |
| Income from pension | 185 | 6077 | 743 | 117 | 4979 | 848 | 68 | 7966 | 1378 |
| Agricultural income | 2988 | 12318 | 417 | 779 | 18052 | 1278 | 2209 | 10296 | 329 |
| **Total income** | **6693** | **25365** | **682** | **3719** | **21800** | **688** | **2974** | **29823** | **1267** |

[7] Weighted and un-weighted gave the same result

**Table 3.4. 7:** Income sources: by gender[8]

| Variable | Regional | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Wage income | 2730 | 41700 | 1486 | 1662 | 44721 | 1918 | 1068 | 36997 | 2346 |
| Business income | 671 | 9129 | 818 | 431 | 9763 | 1148 | 240 | 7988 | 989 |
| Income from Household Female Petty Businesses | 84 | 7371 | 2357 | 44 | 9941 | 4314 | 40 | 4543 | 1362 |
| Income from Underage Children | 9 | 8735 | 6255 | 5 | 13424 | 11281 | 4 | 2875 | 1441 |
| Income from Remittances | 760 | 5976 | 447 | 496 | 5673 | 384 | 264 | 6615 | 1066 |
| Income from pension | 185 | 6077 | 743 | 118 | 6343 | 893 | 67 | 5607 | 1327 |
| Agricultural income | 2988 | 12318 | 417 | 2139 | 12222 | 474 | 849 | 12557 | 853 |
| Total income | 6693 | 25365 | 682 | 4382 | 25753 | 824 | 2311 | 24630 | 1209 |

**Table 3.4. 8:** Income Category by type of income: total income by place of residence and gender

| Income range | Regional | Urban | Rural | Male | Female |
|---|---|---|---|---|---|
| 0 | 4495 | 1492 | 3002 | 3106 | 1388 |
| 0-1000 | 1097 | 625 | 472 | 675 | 422 |
| 1001-5000 | 2136 | 1127 | 1009 | 1357 | 779 |
| 5001-10000 | 1399 | 730 | 669 | 921 | 478 |
| 10001-15000 | 841 | 464 | 377 | 547 | 294 |
| 15001-20000 | 584 | 365 | 219 | 375 | 209 |
| 20001-25000 | 367 | 235 | 132 | 244 | 123 |
| >25001 | 1397 | 818 | 579 | 957 | 440 |

[8] Weighted and un-weighted gave the same result

**Table 3.4. 9:** Income category by type of income : employment (wage income) by place of residence and gender

| Income range | Regional | Urban | Rural | Male | Female |
|---|---|---|---|---|---|
| 0 | 9563 | 3566 | 5996 | 6505 | 3057 |
| 0-1000 | 14 | 10 | 4 | 11 | 3 |
| 1001-5000 | 485 | 459 | 26 | 259 | 226 |
| 5001-10000 | 512 | 469 | 43 | 295 | 217 |
| 10001-15000 | 334 | 315 | 19 | 197 | 137 |
| 15001-20000 | 335 | 312 | 23 | 193 | 142 |
| 20001-25000 | 191 | 174 | 17 | 124 | 67 |
| >25001 | 883 | 552 | 331 | 599 | 284 |

**Table 3.4. 10:** Income category by type of income : business income by place of residence and gender

| Income range | Regional | Urban | Rural | Male | Female |
|---|---|---|---|---|---|
| 0 | 11,060 | 4874 | 6185 | 7402 | 3657 |
| 0-1000 | 582 | 450 | 132 | 348 | 234 |
| 1001-5000 | 451 | 342 | 109 | 285 | 166 |
| 5001-10000 | 97 | 84 | 13 | 67 | 30 |
| 10001-15000 | 35 | 27 | 8 | 21 | 14 |
| 15001-20000 | 20 | 17 | 3 | 14 | 6 |
| 20001-25000 | 16 | 13 | 3 | 9 | 7 |
| >25001 | 56 | 50 | 6 | 37 | 19 |

**Table 3.4. 11:** Income Category by type of income: Income from Household Female Petty Businesses by place of residence and gender

| Income range | Regional | Urban | Rural | Male | Female |
|---|---|---|---|---|---|
| 0 | 12,065 | 5605 | 6459 | 8047 | 4017 |
| 0-1000 | 168 | 168 | 0 | 92 | 76 |
| 1001-5000 | 66 | 66 | 0 | 33 | 33 |
| 5001-10000 | 9 | 9 | 0 | 4 | 5 |
| 10001-15000 | 4 | 4 | 0 | 3 | 1 |
| 15001-20000 | 1 | 1 | 0 | 1 | 0 |
| 20001-25000 | 1 | 1 | 0 | 1 | 0 |
| >25001 | 3 | 3 | 0 | 2 | 1 |

**Table 3.4. 12:** Income Category by type of income: Income from Underage Children by place of residence and gender

| Income range | Regional | Urban | Rural | Male | Female |
|---|---|---|---|---|---|
| 0 | 12279 | 5832 | 6446 | 8160 | 4118 |
| 0-1000 | 29 | 21 | 8 | 18 | 11 |
| 1001-5000 | 7 | 2 | 5 | 4 | 3 |
| 5001-10000 | 1 | 1 | 0 | 0 | 1 |
| 10001-15000 | 0 | 0 | 0 | 0 | 0 |
| 15001-20000 | 0 | 0 | 0 | 0 | 0 |
| 20001-25000 | 0 | 0 | 0 | 0 | 0 |
| >25001 | 1 | 1 | 0 | 1 | 0 |

**Table 3.4. 13:** Income Category by type of income: Remittance income by place of residence and gender

| Income Range | Regional | Urban | Rural | Male | Female |
|---|---|---|---|---|---|
| 0 | 10818 | 4908 | 5908 | 7258 | 3559 |
| 0-1000 | 739 | 632 | 107 | 429 | 310 |
| 1001-5000 | 553 | 258 | 295 | 359 | 194 |
| 5001-10000 | 119 | 30 | 89 | 84 | 35 |
| 10001-15000 | 39 | 16 | 23 | 22 | 17 |
| 15001-20000 | 15 | 3 | 12 | 10 | 5 |
| 20001-25000 | 10 | 2 | 8 | 6 | 4 |
| >25001 | 24 | 8 | 16 | 15 | 9 |

**Table 3.4. 14:** Income Category by type of income: Pension income by place of residence and gender

| Income Range | Regional | Urban | Rural | Male | Female |
|---|---|---|---|---|---|
| 0 | 11543 | 5287 | 6255 | 7715 | 3827 |
| 0-1000 | 589 | 453 | 136 | 350 | 239 |
| 1001-5000 | 111 | 87 | 24 | 70 | 81 |
| 5001-10000 | 58 | 19 | 39 | 34 | 24 |
| 10001-15000 | 9 | 7 | 2 | 8 | 1 |
| 15001-20000 | 3 | 1 | 2 | 3 | 0 |
| 20001-25000 | 1 | 1 | 0 | 1 | 0 |
| >25001 | 3 | 2 | 1 | 2 | 1 |

**Table 3.4. 15:** Income Category by type of income: Agricultural income by place of residence and gender

| Income range | Regional | Urban | Rural | Male | Female |
|---|---|---|---|---|---|
| 0 | 8809 | 4917 | 3891 | 5687 | 3121 |
| 0-1000 | 502 | 152 | 350 | 344 | 158 |
| 1001-5000 | 1194 | 293 | 901 | 848 | 346 |
| 5001-10000 | 806 | 187 | 619 | 578 | 228 |
| 10001-15000 | 405 | 97 | 308 | 289 | 116 |
| 15001-20000 | 195 | 58 | 137 | 144 | 51 |
| 20001-25000 | 116 | 28 | 88 | 86 | 30 |
| >25001 | 289 | 124 | 165 | 206 | 83 |

**Table 3.4. 16:** Total income: by place of residence

| Variable | Region | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Total income | 6693 | 25365 | 682 | 3719 | 21800 | 688 | 2974 | 29823 | 1267 |
| Per adult total income | 6693 | 6855 | 184 | 3719 | 5892 | 185 | 2974 | 8060 | 342 |

**Table 3.4. 17:** Total income: by gender

| Variable | Region | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Total income | 6693 | 25365 | 682 | 4382 | 25753 | 824 | 2311 | 24630 | 1209 |
| Per adult total income | 6693 | 6855 | 15092 | 4382 | 6960 | 222 | 2311 | 6656 | 326 |

**Table 3.4. 18:** Per adult income quintiles by place of residence

| Location | Per adult income Quintiles from lowest (1) to highest (5) | | | | | Total |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | |
| Region | - | - | 701 | 2295 | 16072 | 6855 |
| Urban | - | - | 690 | 2332 | 12548 | 5892 |
| Rural | - | - | 714 | 2254 | 21333 | 8060 |

**Table 3.4. 19: P**er adult income quintiles by gender

| Location | Per adult income Quintiles from lowest (1) to highest (5) | | | | | Total |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | |
| Region | - | - | 701 | 2295 | 16072 | 6855 |
| Male | - | - | 701 | 2293 | 15970 | 6960 |
| Female | - | - | 703 | 2299 | 16280 | 6656 |

## 3. 5 Asset ownership of respondents

According the CSA of Ethiopia and World Bank (2017), asset ownership is considered an important measure of welfare. The acquisition of assets can signal improving living standards, while the depletion of assets can indicate shrinking household wealth and thus a decline in welfare. Hence, information on asset ownership related to possession of different durable items and farm implements were collected. As indicated in Table 3.5.1, the numbers of respondents who are owned some of the durable items are very few. It is expected that the poor are to hold easily liquefiable assets, such as livestock and stored crops.

Asset ownership is a good indicator of households' welfare. Households in the surveyed zones have possessed different assets (Table 3.5.1). For instance, in the urban, infant towns and rural areas, 38.08, 38.59 and 53.83 percent possessed their own houses respectively. At the regional level, 46.41 percent of the respondents possess their own houses. Moreover, in the urban areas

83.81 percent of the respondents own mobile phone. This is lower than the urban mobile ownership at the country level studied by CSA. The mobile ownership for the urban areas at national level was 89.3 percent (CSA, 2017). But when the regional level average (61.59 percent) is taken, the percentage of mobile owners is higher than the aggregate country level (54.4 percent) studied by the agency.

Gold is one of the precious assets that households keep for the uncertain future. At the regional level, 19.73 percent of the household own gold. In the urban centers, the ownership of gold is 37 percent. When this is compared to the results of CSA, gold ownership for the nation as a whole and urban center is 16.4 and 32.8 percent respectively.

**Table 3.5. 1: Possession of durable goods by place of residence (n=12,316)**

| Type of durable items | Region (n=12,316) | Urban (n=4170) | Infant town (n=1687) | Rural (n=6459) |
|---|---|---|---|---|
| Radio | 17.06 | 16.47 | 17.66 | 17.28 |
| Tape recorder | 9.09 | 19.52 | 7.82 | 2.69 |
| Television | 34.33 | 76.72 | 37.40 | 6.22 |
| Refrigerator | 15.96 | 38.68 | 12.57 | 2.18 |
| Bed | 62.61 | 91.32 | 75.99 | 40.58 |
| Chair | 30.76 | 45.85 | 43.69 | 17.63 |
| Table | 24.59 | 47.58 | 28.81 | 8.64 |
| Electric Megogo | 22.39 | 51.51 | 22.11 | 3.67 |
| Gold | 19.73 | 37 | 16.30 | 9.48 |
| Silver | 13.68 | 27.55 | 8.54 | 6.07 |
| Watch | 4.9 | 11.01 | 1.60 | 1.81 |
| Sofa | 13.78 | 38.51 | 3.14 | 0.59 |
| Cupboard (Armadiyo) | 14.32 | 34.2 | 9.31 | 2.80 |
| Bicycle | 3.47 | 8.78 | 1.19 | 0.63 |
| Mobile phone | 61.59 | 83.81 | 54.95 | 48.99 |
| Car | 1.32 | 3.41 | 0.65 | 0.15 |
| House | 46.41 | 38.08 | 38.59 | 53.83 |
| Dis h receiver | 66.14 | 66.14 | - | - |
| Video | 4.08 | 4.08 | - | - |
| Motor cycle | 1.85 | 1.85 | - | - |
| Electric stove | 46.59 | 46.59 | - | - |
| Heater | 3.24 | 3.24 | - | - |
| Juicer | 6.31 | 6.31 | - | - |
| Cupboard goods | 42.78 | 42.78 | - | - |
| Singer | 1.92 | 1.92 | - | - |
| Washing Machine | 2.11 | 2.11 | - | - |
| Iron Machine | 5.08 | 5.08 | - | - |
| Laptop computer | 6.64 | 6.64 | - | - |
| Desktop computer | 1.29 | 1.29 | - | - |
| Tablet computer | 1.27 | 1.27 | - | - |
| Berad | 43.78 | - | 42.86 | 44.02 |
| Pot | 22.02 | - | 10.49 | 25.03 |
| Traditional Megogo | 68.61 | - | 49.56 | 73.59 |
| Traditional Oven | 8.99 | - | 8.83 | 9.03 |
| Charcoal Stove | 15.66 | - | 11.68 | 16.71 |
| Improved stove | 0.71 | - | 0.59 | 0.74 |
| Barrel | 24.97 | - | 27.27 | 24.37 |
| Jerican | 75.45 | - | 60.17 | 79.44 |
| Masho | 3.61 | - | 1.60 | 4.13 |

Source: Tigray household socio-economic baseline survey, 2018

The rural and infant town respondents were asked about the possession of the following farm implements. Related to the possession of farm implements, 64.48 and 30.41 percent of the rural and infant towns own traditional plough (Mulue Mesarie) respectively. The proportion of traditional plough in the rural areas reported by the CSA was also 64.9 percent.

**Table 3.5. 2: Possession of Farm implements by place of residence (%)**

| Type of farm implements | Region (n=8146) | Infant town (n=1687) | Rural (n=6459) |
|---|---|---|---|
| Mulue Mesarie | 57.43 | 30.41 | 64.48 |
| Hoe | 55.67 | 34.44 | 61.22 |
| Shovel | 52.75 | 32.90 | 57.93 |
| Sickle | 65.09 | 40.01 | 71.63 |
| Hammer | 16.46 | 11.56 | 17.74 |
| Axe | 48.42 | 29.52 | 53.35 |
| Saw | 6.36 | 4.39 | 6.87 |
| Wheelbarrow | 6.60 | 4.62 | 7.12 |
| Cart | 1.28 | 2.13 | 1.05 |
| Generator | 1.13 | 0.89 | 1.19 |
| Tridle pump | 0.98 | 0.71 | 1.05 |
| Drip | 0.56 | 0.47 | 0.59 |
| Traditional beehive | 3.46 | 2.19 | 3.79 |
| Modern beehive | 1.56 | 0.89 | 1.73 |
| Chemical sprayer | 1.63 | 1.54 | 1.66 |
| Mechanical water pump | 0.52 | 0.36 | 0.56 |
| Oil based water generator | 0.71 | 0.41 | 0.79 |
| Traditional mill | 10.43 | 6.34 | 11.50 |
| Modern mill house | 0.14 | 0.24 | 0.11 |
| B.B.A.M | 0.56 | 0.36 | 0.62 |
| Small tractor | 0.52 | 0.65 | 0.48 |
| Hand pulled tractor | 0.47 | 0.41 | 0.48 |

Source: Tigray household socio-economic baseline survey, 2018

## 3.6 Household consumption expenditures and poverty analysis

### 3.6.1 Consumption expenditure

The total income of the household has to be either consumed or saved for future consumption. How much to be saved and consumed again depends on household's disposable income and other household characteristics. The disposable income less of saving goes to cover different household expenditures: food and non-food related expenditures. According to the basic principle of economics, other things remaining constant, there is an inverse relationship between the level of household's disposable income and the percentage share of income allocated to food

consumption; the higher the income the lower the percentage share of food expenditure. Taking the share of items listed in Table 3.6.10-3.6.11, below, it clearly shows the dominance of food consumption componentin the household expenditure.

The per adult mean food consumption expenditure at the region, urban and rural were birr 9862, birr 12723 and birr 7252 respectively (Table 3.6.1). Similarly, per adult consumption for male headed household was found to be 20%higher than their counterpart female headed household (Table 3.6.2). However, the mean value usually disguises the potential inequality that might exist within the same unit of analysis.Urbanites, rural residents, male or female headed households are not homogenous groups. Hence, it become advisable to disaggregate the per adult consumption by quintile groups. Accordingly, as indicated in Tables 3.6.3-Table 3.6.7the per adult food consumption (regional) of the first quintile (poorest group) was birr 2971 compared to birr 23290, which is almost 8 times. While the intra-quintile difference (in-equality) slightly increases for urban areas (8.6 times) and the inequality decreases into 6 times for rural areas.
Moreover, some of the selected wealth indicators, such as, land holding size (ha), value of asset holdings, and animal resource ownership (in tropical livestock unit) are also presented in Table 3.6.8 and Table 3.6.9. The findings seems consistent with our expectations, except with the value of asset ownership which reveals asset ownership of female headed household found to be greater than male headed households.

**Table 3.6. 1:** Mean and standard errors of Per adult consumption by place of residence

| | Region | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Per adult food consumption | 12,173 | 9790 | 100 | 5803 | 12638 | 190 | 6370 | 7196 | 64 |
| Per adult non-food consumption | 12,150 | 4044 | 68 | 5757 | 5315 | 129 | 6393 | 2900 | 52 |
| Per adult total consumption | 12,268 | 13696 | 134 | 5832 | 17787 | 253 | 6436 | 9,988 | 90 |

**Table 3.6. 2:** Mean and standard errors of Per adult consumption by gender

| Variable | Region | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Per adult food consumption | 12,173 | 9790 | 100 | 8080 | 10370 | 120 | 4093 | 8644 | 177 |
| Per adult non-food consumption | 12,150 | 4044 | 68 | 8101 | 4531 | 92 | 4049 | 3071 | 87 |
| Per adult total consumption | 12,268 | 13696 | 134 | 8149 | 14751 | 168 | 4119 | 11608 | 216 |

**Table 3.6. 3:** Per capita consumption quintiles and selected wealth indicators across quintiles: regional

| Variable | Per capita adult quintiles from lowest (1) to highest (5) | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | Total |
| per capita adult food consumption | 2971 | 5125 | 7227 | 10156 | 23290 | 9862 |
| per capita adult non-food consumption | 1089 | 1576 | 2464 | 3756 | 11516 | 4641 |
| per capita adult total consumption | 4121 | 7272 | 10161 | 14185 | 32971 | 13794 |

**Table 3.6. 4:** Per capita consumption quintiles and selected wealth indicators across quintiles: Urban

| Variable | Per capita adult quintiles from lowest (1) to highest (5) | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | Total |
| per capita adult food consumption | 2930 | 5155 | 7257 | 10237 | 25132 | 12723 |
| per capita adult non-food consumption | 1090 | 1583 | 2474 | 3790 | 12697 | 5932 |
| per capita adult total consumption | 4095 | 7288 | 10195 | 14295 | 35304 | 17864 |

**Table 3.6. 5:** Per capita consumption quintiles and selected wealth indicators across quintiles: rural

| Variable | Per capita adult quintiles from lowest (1) to highest (5) | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | Total |
| per capita adult food consumption | 2991 | 5108 | 7207 | 10074 | 17702 | 7252 |
| per capita adult non-food consumption | 1088 | 1572 | 2456 | 3723 | 8977 | 3392 |
| per capita adult total consumption | 4135 | 7262 | 10138 | 14073 | 25319 | 10085 |

**Table 3.6. 6:** Per adult consumption quintiles and selected wealth indicators across quintiles: male

| Variable | Per capita adult quintiles from lowest (1) to highest (5) | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | Total |
| per capita adult food consumption | 3064 | 5168 | 7242 | 10178 | 22558 | 10431 |
| per capita adult non-food consumption | 1090 | 1586 | 2464 | 3757 | 11771 | 4938 |
| per capita adult total consumption | 4328 | 7302 | 10193 | 14215 | 32631 | 14857 |

**Table 3.6. 7:** Per adult consumption quintiles and selected wealth indicators across quintiles: female

| Variable | Per capita adult quintiles from lowest (1) to highest (5) | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | Total |
| per capita adult food consumption | 2888 | 5051 | 7192 | 10092 | 25407 | 8732 |
| per capita adult non-food consumption | 1087 | 1559 | 2463 | 3755 | 10681 | 3919 |
| per capita adult total consumption | 3953 | 7219 | 10080 | 14084 | 33966 | 11692 |

**Table 3.6. 8:** Mean and standard error of selected wealth indicators across by place of residence

| Variable | Region | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Land holding (ha) | 12,316 | 0.62 | 0.11 | 5,857 | 0.30 | 0.05 | 6,458 | 0.91 | 0.20 |
| Total asset holding of the household (birr) | 12,316 | 182,211 | 6881 | 5,857 | 380493 | 14020 | 6,458 | 2399 | 218 |
| Tropical livestock unit | 12,317 | 1.67 | 0.04 | 5,857 | 0.74 | 0.06 | 6,459 | 2 | 0.04 |

**Table 3.6. 9:** Mean and standard error of selected wealth indicators across by gender

| Variable | Region | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Land holding (ha) | 12,316 | 0.62 | 0.11 | 8,183 | 0.66 | 0.14 | 4,132 | 0.54 | 0.16 |
| Total asset holding of the household (birr) | 12,316 | 182211 | 6881 | 8,182 | 157960 | 7979 | 4,133 | 230248 | 13046 |
| Tropical livestock unit | 12,317 | 1.67 | 0.04 | 8,183 | 2.20 | 0.04 | 4,133 | 0.61 | 0.08 |

**Table 3.6. 10:** Mean and standard error of annual expenditures of Households for different items (in birr) by place of residence

| Variable | Region | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S.E. |
| cereals | 12,317 | 14441 | 130 | 5,857 | 14060 | 197 | 6,459 | 14789 | 171 |
| pulses | 12,317 | 1840 | 22 | 5,857 | 2004 | 35 | 6,459 | 1692 | 29 |
| oil_seeds | 12,317 | 111 | 5 | 5,857 | 187 | 10 | 6,459 | 43 | 5 |
| drinks | 12,317 | 1818 | 72 | 5,857 | 2291 | 124 | 6,459 | 1390 | 78 |
| spices | 12,317 | 3701 | 44 | 5,857 | 4388 | 83 | 6,459 | 3079 | 35 |
| bread | 12,317 | 1594 | 55 | 5,857 | 3208 | 111 | 6,459 | 129 | 9 |
| coffee | 12,317 | 3533 | 72 | 5,857 | 6040 | 126 | 6,459 | 1260 | 65 |
| vegetable | 12,317 | 2265 | 59 | 5,857 | 4547 | 108 | 6,459 | 196 | 39 |
| Animal bi-products | 12,317 | 8558 | 254 | 5,857 | 17829 | 507 | 6,459 | 152 | 24 |
| Social-contribution | 12,317 | 211 | 8 | 5,857 | 320 | 17 | 6,459 | 112 | 5 |
| transport | 12,317 | 1118 | 175 | 5,857 | 1890 | 365 | 6,459 | 417 | 38 |
| Household utensils & Buildings | 12,317 | 1507 | 225 | 5,857 | 2744 | 467 | 6,459 | 386 | 68 |
| Water- bill | 12,317 | 1935 | 71 | 5,857 | 3450 | 145 | 6,459 | 561 | 23 |
| Clothing | 12,317 | 5157 | 66 | 5,857 | 6623 | 122 | 6,459 | 3828 | 57 |
| Health_expenditures | 12,317 | 398 | 26 | 5,857 | 639 | 51 | 6,459 | 179 | 16 |
| Education_expenditures | 12,317 | 878 | 34 | 5,857 | 1521 | 70 | 6,459 | 295 | 9 |
| others_expenditures | 12,317 | 51 | 15 | 5,857 | 95 | 32 | 6,459 | 11 | 4 |

**Table 3.6. 11:** Mean and standard error of annual expenditures of Households for different items (in birr) by place gender

| Variable | Region | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | S.E. | Obs | Mean | S.E. | Obs | Mean | S. E. |
| cereals | 12,317 | 14441 | 130 | 8,183 | 15172 | 167 | 4,133 | 12997 | 197 |
| pulses | 12,317 | 1840 | 22 | 8,183 | 1879 | 27 | 4,133 | 1763 | 40 |
| oil_seeds | 12,317 | 111 | 5 | 8,183 | 104 | 5 | 4,133 | 126 | 12 |
| drinks | 12,317 | 1818 | 72 | 8,183 | 1951 | 80 | 4,133 | 1556 | 143 |
| spices | 12,317 | 3701 | 44 | 8,183 | 3706 | 34 | 4,133 | 3693 | 112 |
| bread | 12,317 | 1594 | 55 | 8,183 | 1561 | 63 | 4,133 | 1656 | 104 |
| coffee | 12,317 | 3533 | 72 | 8,183 | 3426 | 94 | 4,133 | 3745 | 108 |
| vegetable | 12,317 | 2265 | 59 | 8,183 | 2152 | 71 | 4,133 | 2490 | 104 |
| Animal bi-products | 12,317 | 8558 | 254 | 8,183 | 8294 | 311 | 4,133 | 9082 | 440 |
| Social-contribution | 12,317 | 211 | 8 | 8,183 | 214 | 10 | 4,133 | 205 | 16 |
| transport | 12,317 | 1118 | 175 | 8,183 | 1151 | 254 | 4,133 | 1052 | 131 |
| Household utensils & Buildings | 12,317 | 1507 | 225 | 8,183 | 1607 | 302 | 4,133 | 1310 | 303 |
| Water- bill | 12,317 | 1935 | 71 | 8,183 | 1846 | 80 | 4,133 | 2110 | 139 |
| Clothing | 12,317 | 5157 | 66 | 8,183 | 5328 | 86 | 4,133 | 4818 | 100 |
| Health_expenditures | 12,317 | 398 | 26 | 8,183 | 422 | 35 | 4,133 | 351 | 32 |
| Education_expenditures | 12,317 | 878 | 34 | 8,183 | 880 | 47 | 4,133 | 874 | 41 |
| others_ expenditures | 12,317 | 51 | 15 | 8,183 | 56 | 22 | 4,133 | 41 | 10 |

### 3.6.2 Poverty Analysis

According to the World Bank (2000)[9], "poverty is pronounced deprivation in well-being". But, what is meant by well-being, and as what a reference is used to measure deprivation needs some clarification.

People can be said deprived if they lack the capacity to have access to resources or commodities essential to sustain their life. Accordingly, deprivation/poverty is then measured by comparing individuals' income or consumption with some defined threshold below which they are considered to be poor. This is the most conventional view—poverty is seen largely in monetary terms—and is as well the working definition for the Ethiopian governmentin national poverty analysis.

Another approach, which is conceptually broader and comprehensive to well-being (and hence poverty) measurement is to ask whether people are able to obtain a specifictype of consumption good: Do they have enough food? Or shelter? Or health care? Or education? In this view the analyst goes beyond the more traditional monetary measures of poverty: Nutritional poverty might be measured by examining whether children are stunted or wasted; and educational poverty might be measured by asking whether people are literate or how much formal schooling they have received. But due to the huge data requirement it is not widely used.

The final approach to well-being is the one articulated by AmartyaSen (1987[10]), who argued that well-being comes from a capability to function in society. Thus, poverty arises when people lack key capabilities, and so have inadequate incomes or education, or poor health, or insecurity, or low self-confidence, or a sense of powerless, or the absence of rights such as freedom of speech.Sen's capability approach is more popular in academics than in developmental world.

Once we define what poverty is the next logical issue is why we measure poverty, or why do we want to know the level of poverty. In this regard, we list out at least four fundamental reasons why we need to measure poverty. The main reasons include among other things the following;

[9] World Bank. 2000. World Development Report 2000/2001: Attacking Poverty. Washington, DC:Wor ld Bank.
[10]Sen, Amartya. 1987. Commodities and Capabilities. Amsterdam: North-Holland.

1. keeping poor people on the agenda- as strongly argued by Ravallion (1998) "A credible measure of poverty can be a powerful instrument for focusing the attention of policy makers on the living conditions of the poor." Put another way, it is easy to ignore the poor if they are statistically invisible. The measurement of poverty is necessary if it is to appear on the political and economic agenda.

2. Targeting Domestic and Worldwide Interventions-a second reason for measuring poverty is to target interventions. Clearly, one cannot help poor people without knowing who they are. This is the purpose of a poverty profile, which sets out the major facts on poverty (inequality): by geography (for example, by region, zonal, urban/rural, woredas), by gender (male and female headed household) and by other topologies.

3. Monitoring and Evaluating Projects and Policy Interventions-the third reason for measuring poverty is to be able to predict the effects of, and then evaluate, policies and programs designed to help poor people. Policies that looks good on paper, may in practice not work as well as expected. To judge the effects, one would ideally like to monitor the effects of a policy on poor people and evaluate the outcomes in comparison with a control group (without any support).

4. Evaluating the Effectiveness of Institutions- the fourth reason for measuring poverty is to help evaluate institutions. One cannot tell if a government is doing a good job of combating poverty unless there is solid information on poverty.

Hence, efforts in reducing poverty, involves defining and measuring the extent of poverty, understanding/characterizing the profile of the poor, as well as tracking changes in poverty through time (Pedro, 2002[11]; Reyes, 2002[12]). The measurement of poverty essentially hinges on choosing a welfare indicator, and setting a poverty line, i.e. a minimum value of the welfare indicator that households (or persons) must have to fulfill the his/her basic needs. A common component in virtually all approaches to poverty analysis isthe setting of a poverty line. The most obvious purpose of a poverty line isto distinguish the poor from the non-poor.In developing countries, the poverty lines used for measuring monetary poverty are absolute poverty lines,

[11] Pedro, Ma. Regina A., Luz V. Candelaria, Rowena E. Velasco and Corazon VC. Barba. (2002). Estimating Food Threshold and Poverty Incidence Using Food Basket Across Income Groups and Bottom 30% Income Group. Food and Nutrition Research Institute.

[12] Reyes, Celia M. (2002). The Poverty Fight: Have We Made an Impact? PIDS Discussion Paper Series No. 2002-20, PhilippineInstitute for Development Studies.

which are based on a fixed welfare standard that is merely updated across time by price changes, and whose differing nominal values across regions to reflect cost of living differences. The theory underlying absolutepoverty lines is grounded in welfare economics and constrained utility maximization. The fixed standard of living represented by the poverty line is a level of utility associated with the minimally acceptable standard of living (Ravallion, 1992[13]; 2003[14]). Despite a number of challenges to this approach for the reasons mentioned above (the Ethiopian Government is using approach) we will apply this to ensure comparability.

The three steps that are necessary in measuring poverty are:

- Defining an indicator of welfare,
- Establishing a minimum acceptable standard of that indicator to separate the poor from the non-poor (the poverty line), and
- Generating a summary/ aggregated statistics regarding the distribution of this welfare indicator relative to the poverty line.

  Accordingly, to construct the poverty line we first identified the bundle of goods and services food consumed by the poorest segment of the society. Especially the food poverty line is based on the food-energy intake method, i.e., identify the food items consumed by the poor (using survey data). (**appendix Table 3.6.59-3.6.61**)Second, estimate the quantity of food items that could give an adult household member a predetermined level of minimum calori requirement (2200 kilo calori) per day. Third, assign the price for each item (using survey data), so as to arrive at the minimum household budget required to fulfill the food poverty consumption level of the household (2200 kilo calori per adult per day requirement). We used survey price (household stated price), instead of Central Statistics Agency (CSA) for two reasons: survey data is more recent than any price we can get. Secondly, it is more localized (ranging from Tabia to woreda level) and primary data collected from the households themselves. Hence, we preferred to use our survey collected price, to estimate the cost of living. Finally, count the number of households below the minimum budget line and calculate their

[13] Ravallion, Martin. (1992). Poverty Comparisons: A Guide to Concepts and Methods. LMSS Working Paper 88. World Bank: Washington, D.C.
[14] Ravallion, Martin & Lokshin, Michael. (2003).On the Utility Consistency of Poverty Lines. World Bank Policy Research Working Paper 3157.

percentages. Accordingly, using the household survey data of the poorest section, we have arrived at birr 316 per adult per month food consumption (birr 3792 per annum). Using the national 52% food expenditure share[15]we arrived at an annual expenditure budget of birr 7292 (birr 3500 for non-food expenditure). When we compare the estimated absolute poverty line income with the Ministry of Planning and Finance (2017) absolute poverty income level of: Birr 7184 where birr 3772 food share and birr 3412 non-food), our estimation is 3.8 % higher. However, ours is lower than that of the absolute income level adjusted for inflation one birr 7926.

The most commonly used welfare indicators are consumption or income per capita drawn from household survey data. The choice between the two approaches depends on the state of the socio-economic conditions of the society under study. The choice of whether to adopt income or consumption as a preferred indicator of poverty/welfare depends on how reliably each can be measured. Income tends to be hard to measure in economies where agriculture and self-employment are important employment options. Moreover, in rural and generally poor countries, income is subject to substantial seasonal volatility. Finally, income tends to be underestimated (measurement error) for various reasons. As a result consumption is more likely to be representative of general level of welfare (Haughton, and Khandker, 2009)[16]. Whichever welfare indictor we might pick, the main guiding principle is to select a comprehensive indictor enough to capture important dimensions of wellbeing,

The poverty analysis includes the following measure of poverty:

a. **Incidence of Poverty**: To calculate the incidence of poverty the commonly used measure of absolute poverty in developing countries, namely Head Count Ratio (HCR)-the proportion of the households/population with per adult consumption expenditure below the poverty line defined by the Government of Ethiopia - is used. These poverty line simply include a basket of food providing a minimum calorie intake

[15] Federal Democratic Republic of Ethiopia: National Planning Commission (2017). Ethiopia's Progress Towards Eradicating poverty: an Interim Report on 2015/16 poverty Analysis Study, Addis Ababa, Ethiopia.

[16]Haughton, J. and Khandker, S. (2009). Handbook on Poverty and Inequality. Washington, DC: World Bank. The International Bank for Reconstruction and Development/The World Bank1818 H Street, NW Washington, DC 20433.

of 2,200 per adult per day and other nonfood needs such as clothing, housing, healthcare and education that are regarded necessary for human existence.

b. **The depth and severity of (income) poverty**: This is measured by using the following methods:

i. **Poverty gap ratio** is the sum of income gap ratios of the population below the poverty line divided by the population of the poor: PGR = 1/n Σ[(z – yi)/z], where z is the poverty line income, yi is the income of each poor person,
and n is the total population (poor and non-poor). PGR is an index of the income transfer required to get every poor person out of poverty.

ii. **Severity of poverty** takes into account the distribution of income among the poor and is measured by the squared proportionate poverty gap ratio: SP = 1/n Σ[(z– y1/z)2 + (z– y2/z)2 + (z – y3/z)2 + …. + (z – yq/z)2 ], where z is the poverty line income level, y1 to yq is the individual income level of the q poor persons. n is the total population (poor and non-poor).

Using the absolute poverty line of Birr 7292 the headcount povertyratio of 29.6 %,21.5% and 37 % was estimated for regional, urban and rural areas respectively. Using the computed food poverty line birr 3792, 15%, 10.5 % and 19% headcount poverty level was found for region, urban and rural respectively. The current poverty status is higher by 2.6 percent than the headcount poverty level (27%) reported by National Planning Commission (2015/16). Two possible explanations can be suggested for this. First, the survey period for the current study was conducted during May-June, especially for the rural areas. And these months are among the months of the year where rural areas start to experience food shortage. As a result the low level of consumption (which is unrepresentative months of the year) might have resulted in underestimated consumption level and exaggerated the poverty level. The second possible reason is the economic slow-down due to the drought (2009/10 Ethiopian calendar) that affected some part of the region might have the production, consumption, and poverty level.

A similar feature was also reflected in the inequality. The gini coefficient was estimated to be 0.40, 0.43 and 0.31 for region, urban and rural respectively. Similar to the poverty level, these coefficient were slightly higher than the one estimated by the National Planning Commission

(NPC). The Figure 3.6.1 below shows the distribution Lorenz curve of per adult expenditure by deciles. The vertical distance between the $45^0$ line and the per adult expenditure curve shows the level of inequality. The wider the gap, the higher the inequality and vice versa. Hence, as we can see from the curve as well as from Table 3.6.4, it shows a modest level of inequality. The gini coefficient is not that much high (falling below 0.5), implying that inequality in per adult consumption is not critical in the region.

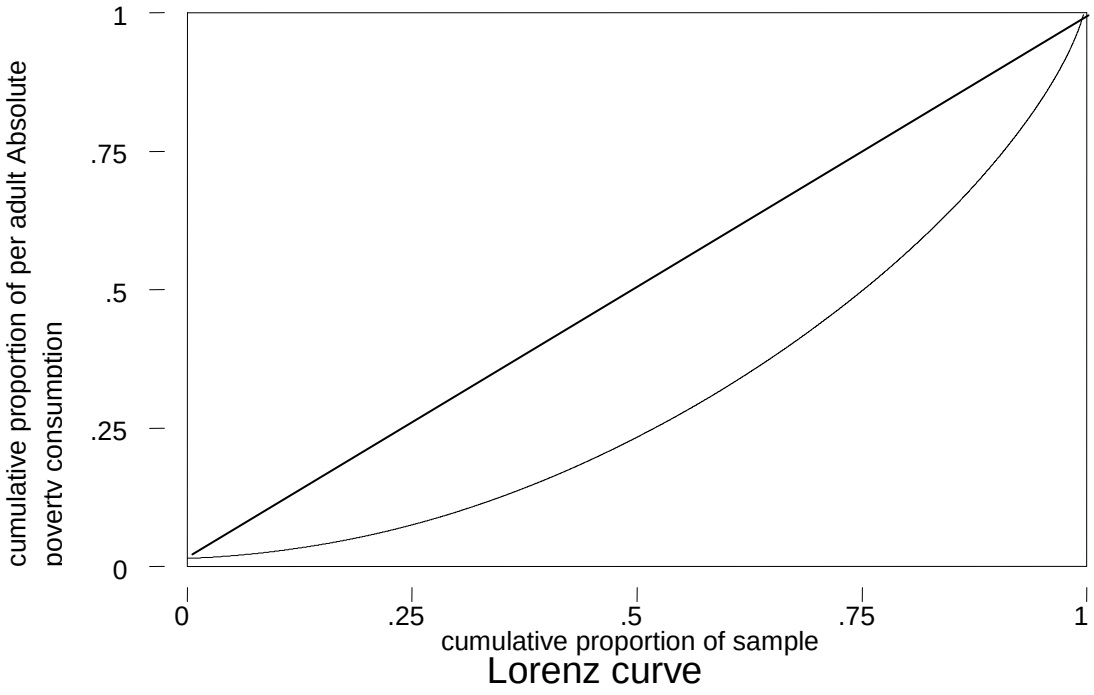



**Figure 3.6. 1: Lorenz curve of Per Adult Absolute Poverty Consumption: Region**

The Lorenz curve of per adult absolute poverty for urban is slightly higher (with a gini-coefficient of 0.43) than the regional (but the rural gini-coefficient (0.31) and the corresponding lorenz curve show very low level of inequalityshows the level of inequality. The wider the gap, the higher the inequality, and vice versa. The gini coefficient as depicted in Table 3.6.4, the overall gap is not that much high (falling below 0.5), implying that inequality in total consumption is not critical in the region.

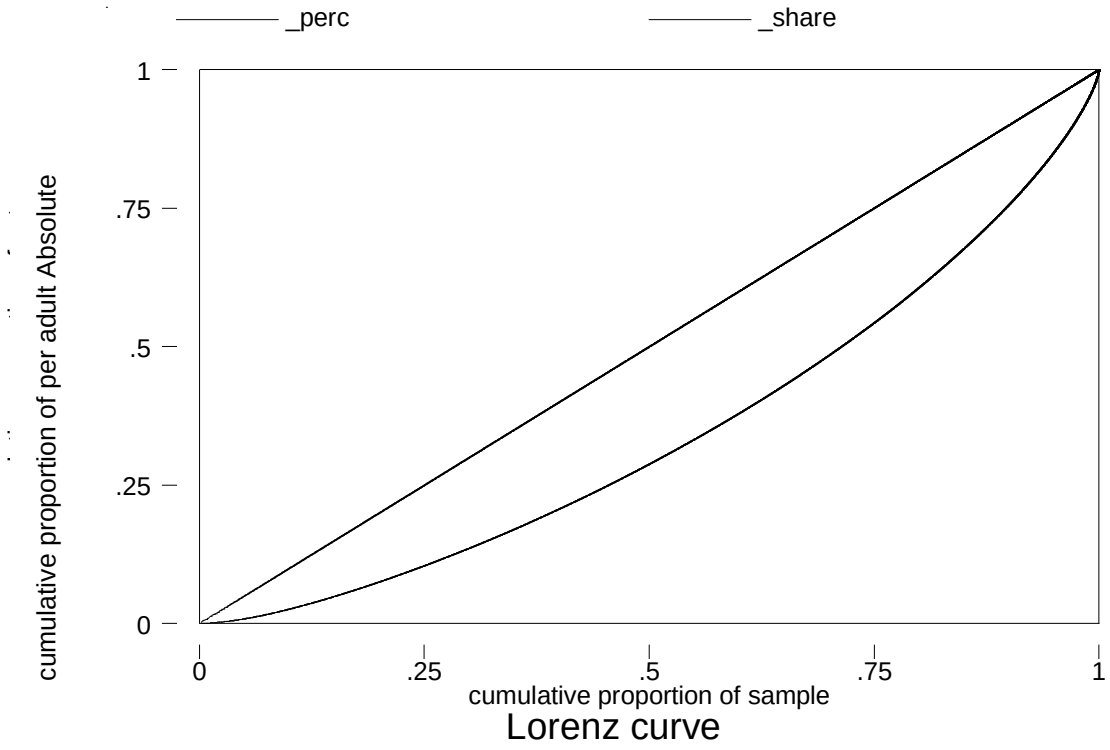



**Figure 3.6. 2: Lorenz curve of Per Adult Absolute Poverty Consumption: Rural**

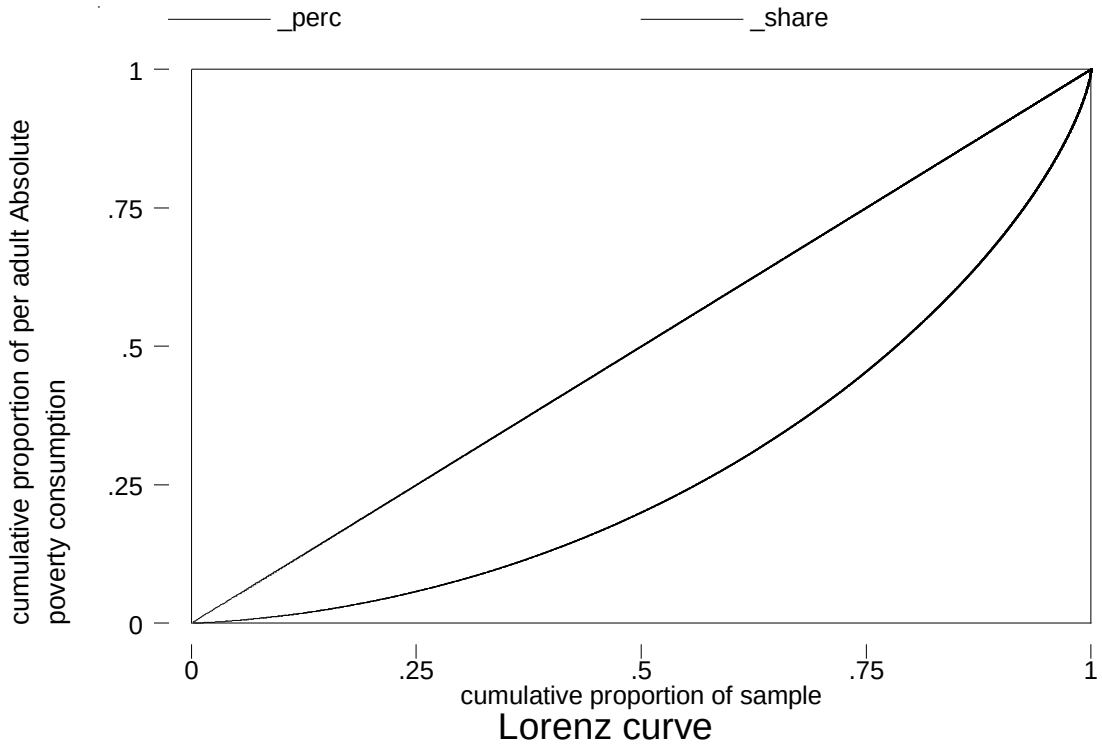



**Figure 3.6. 3: Lorenz curve of Per Adult Absolute Poverty Consumption: Urban**

**Table 3.6. 12:** Food poverty line per adult income Birr 3792: Regional, Urban and Rural

| | Food poverty | | | | |
|---|---|---|---|---|---|
| Indicator | Region | Urban | Rural | Male | Female |
| **Headcount ratio - FGT(0)** | **15.1** | **10.5** | **19.3** | **10.5** | **24.4** |
| Poverty Gap - FGT(1) | 4.1 | 2.9 | 5.2 | 2.6 | 7.1 |
| Poverty Severity - FGT(2) | 1.7 | 1.2 | 2.1 | 1.0 | 3.0 |
| **Gini-coefficient** | **0.42** | **0.43** | **0.30** | **0.39** | **0.46** |

**Table 3.6. 13:** Absolute poverty line income Birr 7292: Regional, Urban and Rural

| | Absolute poverty | | | | |
|---|---|---|---|---|---|
| Indicator | Region | Urban | Rural | Male | Female |
| **Headcount ratio - FGT(0)** | **29.63** | **21.5** | **37.0** | **22.06** | **43.0** |
| Poverty Gap - FGT(1) | 9.34 | 6.8 | 11.6 | 5.7 | 15.0 |
| Poverty Severity - FGT(2) | 4.30 | 3.1 | 5.3 | 2.2 | 7.2 |
| **Gini-coefficient** | **0.40** | **0.43** | **0.31** | **0.38** | **0.44** |

### 3.6. 3 Determinants of poverty

A poverty profile describes the pattern of poverty, but is not principally concerned with explaining its causes. Yet, a satisfactory explanation of why some people are poor is essential if we are to be able to tackle the roots of poverty. In poverty analyses there are several factors that have a decisive influence on the identification and evaluation of the poverty sphere and these are – among others – the following: the establishment of poverty determinants, therefore the factors that increase the poverty risk; the choice of the method used to mark the poverty lines; and the choice of determined indicators that are employed in the estimation and space and time comparison of the range and depth of this sphere.

The main aim of this paper is the attempt at applying the logit regression model in order to establish poverty determinants as well as indicating which of the proposed factors influence the probability of a certain type of household falling into the sphere of relative poverty. Relative poverty is the condition of having fewer resources or less income than others within a society or country, or compared to worldwide averages. Poverty may be due to national, sector-specific, community, household, or individual characteristics. In this we will try to summarize some of the characteristics

of the poor by zonal location community (for instance land holding), household (asset holding, TLU ownership, labor force availability, income diversification etc.,), and individual characteristics (age gender, level of education).

**Table 3.6. 14: Determinates of Poverty status: logit model estimation by place of residence (marginal effect)**

| Variable | Region | | Urban | | Rural | |
|---|---|---|---|---|---|---|
| | ME | S. E | ME | S. E | ME | S. E |
| **Demographic/household characteristics** | | | | | | |
| Gender (1=male, 0 other wise) | -0.2203*** | .0154 | -0.2040*** | 0.0264 | -0.2319*** | 0.0191 |
| Age in years | -0.0273*** | .00263 | -0.0273*** | 0.0048 | -0.0273*** | 0.0031 |
| Age square | 0.0002*** | 0.0000 | 0.0002*** | 0.0000 | 0.0002*** | 0.0000 |
| Lnedu (education expenditure in Birr in log form) | -0.0137*** | 0.0023 | -0.0132*** | 0.0042 | -0.0111*** | 0.0029 |
| Adult_equivalent | -0.0469 | 0.017 | -0.1628*** | 0.0332 | -0.0136 | 0.0212 |
| Income_diversification[17] | -0.0471*** | 0.0098 | -0.0760*** | 0.0184 | -0.0330*** | 0.0116 |
| **Location variables** | | | | | | |
| Central zone | 0.2141*** | 0.0462 | 0.0887* | 0.0530 | 0.0222 | 0.0337 |
| Eastern zone | 0.1651*** | 0.0479 | 0.0765 | 0.0531 | -0.0159 | 0.0345 |
| North west zone | 0.1493*** | 0.0493 | 0.0750 | 0.0589 | -0.0513 | 0.0337 |
| Southern zone | 0.1464*** | 0.0489 | 0.1474** | 0.0598 | -0.0757** | 0.0323 |
| South east zone | 0.1173*** | 0.0514 | 0.0956 | 0.0825 | -0.0957*** | 0.0325 |
| Western zone | 0.1985*** | 0.0526 | 0.1500** | 0.0620 | -- | |
| Mekelle zone | base category | | | | | |
| **Wealth variables** | | | | | | |
| Lnasset (value of assets in birr in natural log form) | -0.0020*** | 0.0018 | -0.0001 | 0.0032 | -0.0005 | 0.0023 |
| Tropical_livestock_unit | -0.0438*** | 0.0033 | -0.0317*** | 0.0070 | -0.0531*** | 0.0039 |
| Lnland-size(in ha) | -0.0415*** | 0.0194 | -0.0834** | 0.0348 | -0.0145 | 0.0235 |
| Correctly predicted | 72% | | 71.4% | | 72.30 | |
| LR chi2(2) | 1137.82 | | 331.63 | | 894.24 | |
| Prob>chi2 | 0.0000 | | 0.0000 | | 0.0000 | |
| Pseudo R2 | 0.1417 | | 0.1522 | | 1530 | |
| Number of observations | 6,148 | | 1,690 | | 4,458 | |

[17] See the income diversification given above.

**Table 3.6. 15: Determinates of Poverty status: logit model estimation by gender**

| Variable | Region | | Male | | Female | |
|---|---|---|---|---|---|---|
| | ME | S. E | ME | ME | S. E | ME |
| **Demographic/household characteristics** | | | | | | |
| Gender (1=male, 0 other wise) | -0.2203*** | .0154 | - | - | - | - |
| Age in years | -0.0273*** | .00263 | -0.0240*** | 0.0027 | -0.0371*** | 0.0053 |
| Age square | 0.0002*** | 0.0000 | 0.0002*** | 0.0000 | 0.0004*** | 0.0001 |
| Lnedu (education expenditure in Birr in log form) | -0.0137*** | 0.0023 | -0.0109*** | 0.0024 | -0.0162*** | 0.0045 |
| Adult_equivalent | -0.0469 | 0.017 | -0.0333* | 0.0184 | -0.0546* | 0.0333 |
| Income_diversification[18] | -0.0471*** | 0.0098 | -0.0175* | 0.0096 | -0.1073*** | 0.0200 |
| **Location variables** | | | | | | |
| Central zone | 0.2141*** | 0.0462 | 0.2744*** | 0.0696 | 0.1466** | 0.0613 |
| Eastern zone | 0.1651*** | 0.0479 | 0.2464*** | 0.0750 | 0.0956 | 0.0643 |
| North west zone | 0.1493*** | 0.0493 | 0.2066*** | 0.0744 | 0.0938 | 0.0666 |
| Southern zone | 0.1464*** | 0.0489 | 0.1926*** | 0.0748 | 0.1202* | 0.0633 |
| South east zone | 0.1173*** | 0.0514 | 0.1565** | 0.0774 | 0.1109* | 0.0674 |
| Western zone | 0.1985*** | 0.0526 | 0.2621*** | 0.0799 | 0.1332** | 0.0682 |
| Mekelle zone | base category | | | | | |
| **Wealth variables** | | | | | | |
| Lnasset (value of assets in birr in n atural log form) | -0.0020*** | 0.0018 | -0.0026 | 0.0019 | -0.0002 | 0.0034 |
| Tropical_livestock_unit | -0.0438*** | 0.0033 | -0.0327*** | 0.0029 | -0.0725*** | 0.0103 |
| Lnland-size(in ha) | -0.0415*** | 0.0194 | -0.0371* | 0.0207 | -0.0388 | 0.0353 |
| Correctly predicted | 72% | | 74% | | 67% | |
| LR chi2(2) | 1137.82 | | 423.18 | | 257.33 | |
| Prob>chi2 | 0.0000 | | 0.0000 | | 0.0000 | |
| Pseudo R2 | 0.1417 | | 0.084 | | 0.1041 | |
| Number of observations | 6,148 | | 4,334 | | 1,814 | |

[18] See the income diversification given above.

We have a logistic regression model to assess the probability of a household being poor. The main idea behind the model is to find the relationship between the probability ($P_i$) that Y will take a 1 value (poor) and the value of 0 (non-poor) otherwise.

The selection of variables was influenced by povertytheoretical literatures. Based on data obtained, we examined the relationship between the dichotomous dependent variable (status of poverty) and a set of independent variables explaining the probability of a household being poor. The main features of the analysis are to identify the factors that explain poverty status of the households and to determine how these factors influence the risk of poverty of a household. The estimated regression coefficients of a logit model are presented in Table 3.6. 14. Since the dependent variable is coded 1 if the household is poor, the positive coefficient indicates that the household is more likely to be poor, and vice versa.

In the demographic/ household characteristics category, all of the explanatory variables have highly significant coefficients except literacy status. The estimated coefficients for the age (-0.1273) and age square (0.0013) of the household head indicate that households heads the likelihood of living in poverty declines until the age of 49 and then after it starts to increase the probability living in poverty. The estimated coefficient for male-headed (-0.9438), indicates that these households are less likely to live in poverty, compared with female-headed households. The coefficient (-0.0749) shows that households with more adult labor force are less probability to live in poverty than households with less labor force supply.

Similarly, we see the relationship between location and poverty, Mekelle zone taken as a base category, as we move from Mekelle to other zones the probability to live in poverty increases, the highest probability being Central, Western (though not consistent with our expectation) and Eastern zone according to their likelihood.

Finally, those households who have higher tropical livestock unit (livestock asset) and land size holdings were found to have less probability to live in poverty, and this is consistent with our expectation.

## 3.7. Credit and saving status of respondents

Financial capital consists of cash, liquid assets, and credit and government transfers. Financial service provisions such as local level saving and credit associations and Micro Finance Institutions (MFIs) are creating access to required capital for participation in new livelihood strategies. Financial assets are measured using proxy indicators, namely livestock assets, access to banking and savings and credit associations. Commercial banks and Micro Finance Institutions are

expanding their branches for the sake of financial inclusions. Based on the baseline study carried out, the credit and saving status of the surveyed households are indicated in the following tables.

As indicated in the table below, at the regional level 19.88% of the respondents have taken credit from different sources in the year 2009 E.C. However, 80.12 percent of the respondents did not take credit in the same year. According to the CSA baseline assessment, 23.4 of the respondents took loan from different sources. This proportion is higher than the proportion of borrowers in Tigray.

**Table 3.7. 1: Distribution of responses of surveyed households on last year's credit**

| Credit status | Region | Urban | | Infant towns | | Rural | |
|---|---|---|---|---|---|---|---|
| | | Male | Female | Male | Female | Male | Female |
| No | 80.12 | 77.07 | 78.18 | 70.70 | 78.66 | 83.11 | 85.25 |
| Yes | 19.88 | 22.93 | 21.82 | 29.30 | 21.34 | 16.89 | 14.75 |
| **Total** | **100** | **100** | **100** | **100** | **100** | **100** | **100** |

Source: Tigray household socio-economic baseline survey, 2018

Dedebit Credit and Saving Institution is the dominant source of credit for the majority (52.86 %) of the respondents. In addition, other Microfinance Institutions such as Adeday, Fana, Lideta and others are the second major source of credit for the surveyed households. The third credit option for the respondents was money lenders. Financial inclusiveness and poor focused credit schemes may reduce money lenders as a source of credit which is expensive and illegal.

**Table 3.7. 2: Sources of loans for the surveyed households**

| Sources of loan | Region (weighted) | Region (un weighted) | Urban | Infant towns | Rural |
|---|---|---|---|---|---|
| DECSI | 52.86 | 52.92 | 41.45 | 64.08 | 60.62 |
| Other Micro Finance Institutions | 15.34 | 16.07 | 22.54 | 13.27 | 9.26 |
| Farmers' Cooperative | 3.05 | 3.10 | 0.75 | 3.24 | 5.68 |
| Government | 3.29 | 3.34 | 5.98 | 0.97 | 1.11 |
| Banks | 6.53 | 6.68 | 5.56 | 5.18 | 8.40 |
| Community Credit Associations | 0.39 | 0.44 | 0.43 | - | 0.62 |
| Money lenders | 15.83 | 14.74 | 19.23 | 11.97 | 12.72 |
| Family or friends | 2.13 | 2.16 | 3.63 | 0.97 | 0.86 |
| Other | 0.58 | 0.54 | 0.43 | 0.32 | 0.74 |
| **Total** | **100** | **100** | **100** | **100** | **100** |

Source: Tigray household socio-economic baseline survey, 2018

For the majority of the borrowers (76.61%), the loan arrangement was individual based loan arrangement. The majority of borrowers (60.89%) have also pledged collateral to fulfill the credit

requirements of lenders. In urban and rural communities, where asset for collateral is limited, group collateral has helped borrowers to access to credit services. DECSI uses a group based model in which members are jointly accountable for each other's loans. The institution believes that the group lending approach is a helpful tool to minimize the problems of adverse selection and moral hazards associated with information asymmetry and subsequently reduces the number of non-performing loans. The group lending was serving as collateral to the lending institution. However, currently borrowers tend to prefer individual loan arrangement rather than group based once.

**Table 3.7. 3: Loan arrangement and collateral responses**

| Category | Responses | Region | Urban | Infant towns | Rural |
|---|---|---|---|---|---|
| **Loan arrangement** | Group | 23.39 | 16.67 | 26.54 | 26.91 |
| | Individual | 76.61 | 83.33 | 73.46 | 73.09 |
| | **Total** | **100** | **100** | **100** | **100** |
| **Collateral** | No | 39.11 | 39.21 | 30.45 | 41.31 |
| | Yes | 60.89 | 60.79 | 69.55 | 58.69 |
| | **Total** | **100** | **100** | **100** | **100** |

Source: Tigray household socio-economic baseline survey, 2018

At the regional level, the average loan amount was 43,340.4 birr for the households who have taken credit. Compared to the average loan amount, the estimated collateral property value was very high. As houses are the preferred type of collateral by Micro Finance Institutions and formal banks, it is expected the collateral estimated birr value to be high. The average repayment period is also 26.68 months.

**Table 3.7. 4: Average loan amount, collateral and loan repayment periods**

| | **Region** | | **Urban** | | **Infant towns** | | **Rural** | |
|---|---|---|---|---|---|---|---|---|
| **Categories** | % | Average | % | Average | % | Average | % | Average |
| Average loan amount (birr) | 16.56 | 38304 | 22.23 | 67505 | 18.32 | 33899 | 12.43 | 13509 |
| Estimated collateral property value (birr) | 6.73 | 285532 | 8.87 | 611074 | 9.60 | 185436 | 4.60 | 60088 |
| Loan repayment period (months) | 15.63 | 26.18 | 20.48 | 29.08 | 17.43 | 25.74 | 12.03 | 23.71 |

Source: Tigray household socio-economic baseline survey, 2018

The majority of the respondents (84.01 %) have made the repayment of their loans on time. The respondents who did not pay on time were asked to provide the reasons of their delay. For the majority of them (37.84 %) failing to have a proper utilization of the borrowed money was the

critical reason. Borrowers should have a clear plan how they are going to use the loan. This helps for a proper utilization of a loan and hence a repayment on time.

**Table 3.7. 5: Responses on payment on time and possible reasons that hamper repayment on time**

| Category | Responses | Region (weighted) | Region (un weighted) | Urban | Infant towns | Rural |
|---|---|---|---|---|---|---|
| **On time payment** | No | 15.99 | 16.49 | 13.51 | 14.24 | 20.74 |
| | Yes | 84.01 | 83.51 | 86.49 | 85.76 | 79.26 |
| | **Total** | **100** | **100** | **100** | **100** | **100** |
| **Reasons for not repaying on time** | Other members late to pay | 5.48 | 5.68 | 5.08 | 7.21 | 5.40 |
| | Too short time to pay | 15.24 | 15.15 | 16.95 | 14.41 | 14.77 |
| | Bankrupt | 10.45 | 11.70 | 27.97 | 9.01 | 7.10 |
| | No reason | 0.51 | 0.52 | 2.54 | - | - |
| | Not proper use | 37.84 | 36.14 | 10.17 | 32.43 | 46.02 |
| | Others | 30.48 | 30.81 | 37.29 | 36.94 | 26.70 |
| | **Total** | **100** | **100** | **100** | **100** | **100** |

Source: Tigray household socio-economic baseline survey, 2018

When respondents were asked to state the areas of loan utilization, the majority of them (25.75 per cent) said it was to start a new business. Others options, such as for food consumption and buy livestock were the second and third dominant loan utilization areas in that order.

**Table 3.7. 6: Responses of surveyed households on areas of loan utilization**

| Areas of loan utilization | Region (weighted) | Region (un weighted) | Urban | Infant towns | Rural |
|---|---|---|---|---|---|
| Start a new business | 25.69 | 25.75 | 30.43 | 31.49 | 18.34 |
| Buy consumer durables | 12.82 | 12.77 | 16.28 | 10.71 | 9.67 |
| Travel expenses | 2.23 | 2.34 | 1.11 | 3.90 | 3.10 |
| Food | 18.27 | 17.84 | 14.60 | 13.31 | 23.17 |
| Medical needs | 0.89 | 0.84 | 0.89 | 0.32 | 0.99 |
| School fees | 1.73 | 1.59 | 1.90 | 0.65 | 1.61 |
| Marriage | 0.54 | 0.6 | 0.33 | 0.65 | 0.87 |
| Burial or funeral | 0.10 | 0.1 | 0.22 | - | - |
| Other ceremony | 2.18 | 2.34 | 4.68 | 0.65 | 0.37 |
| Repay other loan | 1.73 | 1.84 | 0.89 | 1.95 | 2.85 |
| Buy livestock | 13.47 | 13.47 | 2.23 | 13.31 | 26.02 |
| Build a house | 12.97 | 12.92 | 18.39 | 11.69 | 7.31 |
| Pay rents or taxes | 0.74 | 0.7 | 0.56 | 0.97 | 0.74 |
| Pay for hired labour | 0.84 | 0.84 | 0.67 | 2.27 | 0.50 |
| Others | 5.79 | 6.06 | 6.80 | 8.12 | 4.46 |
| **Total** | **100** | **100** | **100** | **100** | **100** |

Source: Tigray household socio-economic baseline survey, 2018

The dominant number of respondents did not lend money to others. Households who lent money to others were only 2.36 % (Table 3.7.7). The proportion of respondents from the urban areas who lent money to others was more than the rural areas. This is a logical result as the rural areas are more cash constrained to lend to others compared to rural and infant towns.

**Table 3.7. 7: Responses of surveyed households on lending money to others**

| Lent money | Region | Urban | Infant towns | Rural |
|---|---|---|---|---|
| No | 97.64 | 96.52 | 97.15 | 98.49 |
| Yes | 2.36 | 3.48 | 2.85 | 1.51 |
| **Total** | **100** | **100** | **100** | **100** |

Source: Tigray household socio-economic baseline survey, 2018

Respondents lent their money mainly to their relative (Table 3.7.8). The number of respondents who lent money to relatives and traders were 88.95 and 7.00 percent respectively. The average loan amount to relatives and traders was 14503 and 21839 birr in that order.

**Table 3.7. 8: Average loan amount to different borrowers provided by the respondents**

| Categories | Region | | Urban | | Infant towns | | Rural | |
|---|---|---|---|---|---|---|---|---|
| | % | Average | % | Average | % | Average | % | Average |
| Average loan amount (birr) to relatives | 88.95 | 14503 | 80.92 | 13852.75 | 83.72 | 23394 | 95.51 | 6261 |
| Average loan amount (birr) to debtors | 4.94 | 31575 | 3.29 | 52520 | 9.03 | 10630 | - | - |
| Average loan amount (birr) to traders | 7.00 | 21839 | 11.84 | 49266.67 | 4.65 | 7500 | 4.49 | 8750 |
| Average loan amount (birr) to others | 3.48 | 89025 | 3.95 | 176050 | 2.33 | 2000 | - | - |

Source: Tigray household socio-economic baseline survey, 2018

Equb is a traditional saving and credit institution with a rotating fund to its members. Edir is an indigenous voluntary association which is formed by people living in the same community. At the regional level, 13.85 and 23.92 percent of the respondents are Equb and Edir members respectively. As expected, the percentage of Equb and Edir members in the urban areas exceeds the rural areas.

**Table 3.7. 9: Equb and Edir membership**

| Category | Responses | Region | Urban | Infant towns | Rural |
|---|---|---|---|---|---|
| Equb membership | No | 86.15 | 76.07 | 83.07 | 93.45 |
| | Yes | 13.85 | 23.93 | 16.93 | 6.55 |
| | **Total** | **100** | **100** | **100** | **100** |
| Edir membership | No | 76.08 | 56.15 | 81.24 | 87.52 |
| | Yes | 23.92 | 43.85 | 18.76 | 12.48 |
| | **Total** | **100** | **100** | **100** | **100** |

Source: Tigray household socio-economic baseline survey, 2018

From the total of surveyed households, 18.60 percent of the households save in different areas. The percentage of savers in the urban areas is much higher than the infant towns and rural areas. The government of Ethiopia, through its financial institutions, is trying to ensure financial inclusiveness and the bankability of both urban and rural areas. It is with this objective the commercial bank and other Micro Finance Institutions are opening new branches to provide financial services with a reasonable distance to the customers. Thus, banks and MFIs are expanding their areas of operation up to Woreda level to mobilize more savings and serve the under-banked economy.

**Table 3.7. 10: Responses of surveyed households on savings**

| Saving | Region (weighted) | Region (un weighted) | Urban | Infant towns | Rural |
|---|---|---|---|---|---|
| No | 81.40 | 81.37 | 70.72 | 80.90 | 88.33 |
| Yes | 18.60 | 18.63 | 29.28 | 19.10 | 11.67 |
| **Total** | **100** | **100** | **100** | **100** | **100** |

Source: Tigray household socio-economic baseline survey, 2018

At the regional level, majority of the respondents (56.91 percent) save their money in private and public commercial banks. The average saving of those who saved money in the commercial banks were 36267 birr. Micro Finance Institutions (MFIs) are the second (24.80 percent) preferred institution to save money. The average amount saved in the Micro Finance Institutions was 15593 birr.

**Table 3.7. 11: Proportions and average saving of households who saved money in 2009 E.C**

| | Region | | Urban | | Infant towns | | Rural | |
|---|---|---|---|---|---|---|---|---|
| **Categories** | % | Average | % | Average | % | Average | % | Average |
| Home | 4.91 | 7568 | 3.75 | 7801.45 | 4.10 | 9807.69 | 7.25 | 5096.23 |
| Micro Finance Institutions (MFIs) | 24.80 | 15593 | 21.53 | 16612.14 | 29.02 | 20343 | 28.59 | 9824.74 |
| Associations | 12.51 | 4123 | 6.3 | 4694.71 | 11.36 | 5042.94 | 23.67 | 2631.35 |
| Reliable friends or relatives | 0.86 | 33950 | 0.64 | 14170 | 1.58 | 68256.5 | 0.96 | 19423 |
| Commercial bank | 56.91 | 36267 | 67.78 | 51724.41 | 53.94 | 35128 | 39.53 | 21950 |
| **Total** | **100** | **19500** | **100** | **19000.54** | **100** | **27715.6** | **100** | **11785** |

Source: Tigray household socio-economic baseline survey, 2018

Respondents were asked to why they did not save money in the year 2009. The majority of the respondents (96.12 percent) said they did not have any money to save. This is the main reason cited in the urban, infant and rural areas. Moreover, holding savings in kind than in cash was the second main reason for respondents. For instance, in the rural areas livestock has been taken as a major asset and accumulation of wealth.

**Table 3.7. 12: Reasons provided by households who did not save money in 2009 E.C**

| Reasons | Region (weighted) | Region (un weighted) | Urban | Infant towns | Rural |
|---|---|---|---|---|---|
| I do not have any money to save | 96.12 | 96.20 | 93.99 | 94.93 | 97.58 |
| No organization with which I can save in | 0.09 | 0.10 | 0.26 | - | 0.05 |
| It would be difficult to withdraw the money | 0.26 | 0.27 | 0.33 | 0.44 | 0.19 |
| I prefer to hold saving in kind than in cash | 1.88 | 1.86 | 2.15 | 2.87 | 1.48 |
| If I have cash saved, people can ask me for money | 0.13 | 0.13 | 0.11 | 0.29 | 0.11 |
| Others | 1.51 | 1.44 | 3.17 | 1.47 | 0.60 |
| **Total** | **100** | **100** | **100** | **100** | **100** |

Source: Tigray household socio-economic baseline survey, 2018

In the rural and infant towns Dedebit Credit and Saving Institution (DECSI) is the major credit source. It provides credit opportunity for those who do not have collateral to pledge. Thus, 26 and 18.18 percent of the surveyed households from the infant towns and rural areas had credit experience from DECSI respectively.

**Table 3.7. 13: Credit experience of surveyed households from DECSI**

| Credit from DECSI | Region | Infant towns | Rural |
|---|---|---|---|
| No | 80.20 | 74.00 | 81.82 |
| Yes | 19.80 | 26.00 | 18.18 |
| **Total** | **100** | **100** | **100.00** |

Source: Tigray household socio-economic baseline survey, 2018

Respondents were asked about DECSI's group loan areas of utilization. The majority of the respondents cited buying oxen was the utilization of the loan. It easy to see how the loan took from DECSI was utilized to own the vital asset in the rural areas. The possession of oxen determines the farming ability of farm operators because if farmers do not have oxen they would be obliged to rent out their land to other farmers. In this case, farmers would enter into sharecropping. This further diminishes the production and income of the household as the yield is shared with oxen owners. There are advantages associated with owning oxen. Oxen owners can cultivate and sow their land at the right time. This has a positive impact on the productivity of land. In addition, oxen could also be rented out on a daily payment basis to till the land for other households.

**Table 3.7. 14: Responses of surveyed households on Dedebit group loan utilization**

| Areas of Dedebit loan utilization | Region | Infant towns | Rural |
|---|---|---|---|
| To buy ox | 26.63 | 11.73 | 32.16 |
| Milk cow | 11.20 | 5.59 | 13.28 |
| Other cattle | 2.27 | 3.35 | 1.87 |
| Sheep and goat | 7.87 | 7.82 | 7.88 |
| Pack animal | 3.18 | 0.56 | 4.15 |
| Poultry | 0.45 | - | 0.62 |
| Bee keeping | 0.91 | 0.56 | 1.04 |
| Trade | 10.14 | 14.53 | 8.51 |
| Handcraft | 0 | - | - |
| Tilfi | 0.15 | 0.56 | - |
| Chemical fertilizer | 3.48 | 3.35 | 3.53 |
| Improved seeds | 1.66 | 2.79 | 1.24 |
| Pesticides | 1.21 | 2.23 | 0.83 |
| Household consumption | 8.62 | 12.85 | 7.05 |
| Health expenses | 1.97 | 3.91 | 1.24 |
| Ceremonies | 0.61 | - | 0.83 |
| Education expenses | 1.66 | 1.68 | 1.66 |
| Clothes | 1.06 | 2.23 | 0.62 |
| House rent | 1.06 | 1.12 | 1.04 |
| Others | 15.89 | 25.14 | 12.45 |
| **Total** | **100** | **100** | **100** |

Source: Tigray household socio-economic baseline survey, 2018

Surveyed households were asked their own self-evaluation on meeting loan repayment schedule of Dedebit. For the majority of respondents in the infant towns and rural areas, they believe loan repayment has always made on time. The social pressure of the communities has its own positive contribution in enforcing repayment of loans. This social pressure is strong in infant towns and rural areas where the communities know each other.

**Table 3.7. 15: Responses of surveyed households on Dedebit loan repayment self-evaluation**

| loan repayment self-evaluation | Region | Infant towns | Rural |
|---|---|---|---|
| Always pay on time | 77.32 | 79.18 | 76.62 |
| Mostly on time but sometimes delayed | 15.48 | 14.42 | 15.87 |
| Mostly delayed but sometimes on time | 2.30 | 1.83 | 2.47 |
| Mostly delayed | 2.55 | 3.43 | 2.22 |
| Unable to pay | 1.74 | 0.92 | 2.05 |
| Others | 0.62 | 0.23 | 0.77 |
| **Total** | **100** | **100** | **100** |

Source: Tigray household socio-economic baseline survey, 2018

Surveyed households were asked their own self-evaluation on the importance of Dedebit loan. The majority (38.28 percent) of the respondents said it is highly important. As long as there is a clear

plan on the utilization of the loan, it is important in a highly cash scarce society. The responses of the respondents reflect the reality in the infant town and rural areas.

**Table 3.7. 16: Evaluation of surveyed households on the importance of Dedebit loan**

| Importance of Dedebit loan | Region | Infant towns | Rural |
|---|---|---|---|
| Highly important | 38.28 | 40.73 | 37.37 |
| Very important | 29.40 | 29.98 | 29.18 |
| Important | 25.23 | 23.57 | 25.85 |
| Somewhat important | 3.17 | 2.52 | 3.41 |
| Not important or harmful | 1.80 | 1.60 | 1.88 |
| Not important | 2.11 | 1.60 | 2.30 |
| | **100** | **100** | **100** |

Source: Tigray household socio-economic baseline survey, 2018

The major crop buyers of respondents (91.03 percent) were whole sellers. Moreover, the major vegetable buyers were also whole sellers. In the rural areas, the major buyers of crops are retailers.

**Table 3.7. 17: Agricultural products and response on type of buyers**

| | Responses on product buyers | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Types of agricultural products | Region | | | Infant town | | | Rural | | |
| | Whole sellers | Retailers | Others | Whole sellers | Retailers | Others | Whole sellers | Retailers | Others |
| Crops | 91.03 | 90.24 | 34.90 | 97.64 | 87.74 | 32.35 | 88.51 | 90.69 | 35.65 |
| Vegetables | 5.59 | 2.09 | 1.34 | 1.89 | 3.87 | - | 7.00 | 1.77 | 1.74 |
| Others | 3.38 | 7.67 | 63.76 | 0.47 | 8.39 | 67.65 | 4.49 | 7.54 | 62.61 |
| **Total** | **100** | **100** | **100** | **100** | **100** | **100** | **100** | **100** | **100** |

Source: Tigray household socio-economic baseline survey, 2018

As indicated below, the market place for agricultural products is the Woreda market. As tabia markets are undeveloped and non-existence in some of rural areas, it is the second ranked market place of agricultural products. No one responded associations or cooperatives as a market place for the agricultural products. The critical task of cooperatives such as buying and storing of products in the peak period for farmers to get a reasonable price is missing. The cooperatives did not engage in these critical services which stabilize the supply of agricultural products in the market. They are engaged in supplying inputs (chemical fertilizers and improved seeds) without providing any help to farmers in the process of selling their yield.

**Table 3.7. 18: Market places of agricultural products**

| Market | Region | Infant towns | Rural |
|---|---|---|---|
| Associations | - | - | - |
| Kushet/Tabia market | 23.19 | 28.57 | 21.82 |
| Woreda market | 49.28 | 42.86 | 50.91 |
| Zone market | 13.04 | 7.14 | 14.55 |
| Mekelle | 4.35 | 7.14 | 3.64 |
| Others | 10.14 | 14.29 | 9.09 |
| **Total** | **100** | **100** | **100** |

Source: Tigray household socio-economic baseline survey, 2018

Respondents have been asked about the round trip distance to their agricultural product market. The average round trip distance was 17.49 kilometres. The round trip time taken was 1.62 and 0.41 hours on foot and by car respectively.

**Table 3.7. 19: Round trip distance and time taken to agricultural product market**

| | Region | | Infant towns | | Rural | |
|---|---|---|---|---|---|---|
| **Categories** | % | Average | % | Average | % | Average |
| Round trip distance to the market (km.) | 34.00 | 17.49 | 27.39 | 16.9 | 35.73 | 18.07 |
| Round trip time taken on foot (hours) | 34.03 | 1.62 | 27.33 | 1.23 | 35.78 | 2.01 |
| Round trip time taken by car (hours) | 30.42 | 0.41 | 23.12 | 0.40 | 32.33 | 0.41 |

Source: Tigray household socio-economic baseline survey, 2018

Respondents were also asked about the means of transport mainly used while taking their products to market. For the majority of the respondents, human power is the dominant means of taking agricultural products and other items to the market place. Moreover, pack animals were the second most frequent means of taking the product to the market. This indicates that respondents relied on human power and pack animals as major means of transport. The sales of meagre quantities of agricultural products do not qualify for conventional motor vehicles as a means of transport.

**Table 3.7. 20: Means of transportation to the market place**

| Transportation type | Region | Infant towns | Rural |
|---|---|---|---|
| Human power | 58.56 | 60.68 | 58.01 |
| Pack animals | 22.87 | 15.44 | 24.78 |
| Vehicle | 15.72 | 18.28 | 15.07 |
| Others | 2.85 | 5.61 | 2.14 |
| **Total** | **100** | **100** | **100** |

Source: Tigray household socio-economic baseline survey, 2018

For the majority of the respondents (48.82 percent), the type of road to the nearest town is soil road. Moreover, asphalt and gravel roads are the second and third type of roads respectively.

**Table 3.7. 21: Type of road to the nearest town**

| Transportation type | Region | Infant towns | Rural |
|---|---|---|---|
| Asphalt road | 24.20 | 41.18 | 19.81 |
| Stone road | 3.06 | 1.26 | 3.52 |
| Gravel road | 22.69 | 18.61 | 23.75 |
| Soil road | 48.82 | 38.36 | 51.52 |
| Others | 1.23 | 0.60 | 1.40 |
| **Total** | **100** | **100** | **100** |

Source: Tigray household socio-economic baseline survey, 2018

Respondents were asked the road service convenience to and from their Kushet during rainy season. Most of the respondents said it is very good for any vehicles. Moreover, reasonable accesses for any vehicles and only on foot are the second and third ranked options.

**Table 3.7. 22: Road service convenience to and from Kushet during rainy season**

| Road services | Region | Infant towns | Rural |
|---|---|---|---|
| Very good access for any vehicles | 36.93 | 56.75 | 31.80 |
| Reasonable access for any vehicles | 22.90 | 17.34 | 24.34 |
| Very good access for trucks & buses | 3.69 | 4.74 | 3.41 |
| Reasonable access for trucks & buses | 9.89 | 6.84 | 10.67 |
| Access for cart/pack animals | 3.91 | 2.34 | 4.31 |
| Only on foot | 22.69 | 12.00 | 25.46 |
| **Total** | **100** | **100** | **100** |

Source: Tigray household socio-economic baseline survey, 2018

Respondents were asked the road service convenience to and from their Kushet during dry season. Most of the respondents stated that it is very good for any vehicles. Moreover, reasonable accesses for any vehicles and only by foot are the second and third ranked options.

**Table 3.7. 23: Road service convenience to and from Kushet during dry season**

| Road services | Region | Infant towns | Rural |
|---|---|---|---|
| Very good access for any vehicles | 37.92 | 55.10 | 33.47 |
| Reasonable access for any vehicles | 22.91 | 18.91 | 23.94 |
| Very good access for trucks & buses | 4.56 | 5.34 | 4.36 |
| Reasonable access for trucks & buses | 10.14 | 6.90 | 10.98 |
| Access for cart/pack animals | 3.61 | 2.10 | 4.01 |
| Only on foot | 20.86 | 11.64 | 23.24 |
| **Total** | **100** | **100** | **100** |

Source: Tigray household socio-economic baseline survey, 2018

The main task of extension agents is to support and encourage farmers to enhance their productivity. To this end, they make group and individual meetings with farmers in dry and rainy

seasons. The average group meeting in the rainy and dry season was 2.49 and 2.62 times respectively. The individual advice of farmers by extension agents are rare cases. The individual contacts are mainly to persuade farmers to apply chemical fertilizers and improved seeds. The main purpose of the contacts is for campaigning about the utilization of chemical fertilizers to fulfil their quotas.

**Table 3.7. 24: Frequency of group and individual meetings with extension agents in the last rainy and dry season**

| Seasons (group meetings) | Region (%) | Average contacts | Infant towns (%) | Average contacts | Rural (%) | Average contacts |
|---|---|---|---|---|---|---|
| Rainy season | 28.17 | 2.49 | 17.37 | 2.54 | 31.00 | 2.44 |
| Dry season | 25.62 | 2.62 | 15.47 | 2.66 | 28.27 | 2.58 |
| **Seasons (individual meetings)** | | | | | | |
| Rainy season | 0.80 | 2.2 | 0.59 | 2.4 | 0.85 | 2.00 |
| Dry season | 31.38 | 2.4 | 15.47 | 2.52 | 27.34 | 2.28 |

Source: Tigray household socio-economic baseline survey, 2018

There are many purposes for the farmers to meet extension agents as stated below. The most frequently cited purpose of group meeting with extension agents was to get advice on chemical fertilizers. In the sowing time, extension agents meet farmers to convince them to purchase chemical fertilizers. In addition to this, the second purpose of individual meeting with extension agents was to get advice on new improved seeds utilization.

**Table 3.7. 25: Purpose of group meeting with extension agents in the last rainy and dry season**

| Purpose | Region | Infant towns | Rural |
|---|---|---|---|
| Advice on chemical fertilizer utilization | 83.39 | 82.61 | 83.51 |
| Advice on irrigation | 1.14 | 1.16 | 1.14 |
| Advice on new improved seeds utilization | 2.28 | 2.32 | 2.27 |
| Advice on epidemic diseases | 0.43 | 0.29 | 0.45 |
| Advice on insect infestation | 0.94 | 1.45 | 0.86 |
| Advice on problems related to ecosystem | 0.20 | 0.29 | 0.18 |
| Advice on input and output market | - | - | - |
| Advice on credit services | 0.12 | - | 0.14 |
| Advice on other general issues | 5.89 | 3.77 | 6.22 |
| Other advices | 5.61 | 8.12 | 5.22 |
| **Total** | **100** | **100** | **100** |

Source: Tigray household socio-economic baseline survey, 2018

Similar to the purpose of group meeting, the most frequently cited purpose of individual meeting with extension agents was to get advice on chemical fertilizers. In the sowing time, extension agents meet farmers to convince them to purchase chemical fertilizers. In addition to this, the

second purpose of individual meeting with extension agents was to get advice on new improved seeds utilization. In extension service arrangement, individual contact with farmers is very rare. As mentioned above, extension agents meet farmers individually to agitate them to buy chemical fertilizers and improved seeds.

**Table 3.7. 26: Purpose of individual meeting with extension agents in the last rainy and dry season**

| Purpose | Region | Infant towns | Rural |
|---|---|---|---|
| Advice on chemical fertilizer utilization | 49.44 | 47.51 | 49.75 |
| Advice on irrigation | 4.77 | 5.28 | 4.69 |
| Advice on new improved seeds utilization | 14.90 | 17.01 | 14.57 |
| Advice on epidemic diseases | 1.83 | 2.35 | 1.75 |
| Advice on insect infestation | 3.06 | 3.52 | 2.99 |
| Advice on problems related to ecosystem | 0.83 | 0.29 | 0.92 |
| Advice on input and output market | 0.83 | - | 0.97 |
| Advice on credit services | 0.52 | 0.59 | 0.51 |
| Advice on other general issues | 11.69 | 9.38 | 12.05 |
| Other advices | 12.12 | 14.08 | 11.82 |
| **Total** | **100** | **100** | **100** |

Source: Tigray household socio-economic baseline survey, 2018

## 3.9. Water Supply and Irrigation

The provision of safe and adequate water supply for the population has far reaching effects on health, productivity, quality of life, and at large to reduce poverty and ensure sustainable socio-economic development (Ministry of water irrigation and electric, 2015). Although a lot of effort has been done by the government to improve the water supply condition of Tigray, previous works indicated that urban water supply system is still quite poor in the region in terms coverage and quality. For example, as stated in the GTP-2, the goals of the government were to provide urban water supply access minimum service level of:

- 100 l/c/day for category-1 towns/cities (cities with a population more than 1 million),
- 80 l/c/day for category-2 towns/cities(towns/cities with a population in the range of 100,000-1million)
- 60 l/c/day for category-3 towns/cities (towns/cities with a population in the range of 50,000 -100,000)
- 50 l/c/day for category - 4 towns/cities (towns/cities with a population in the range of 20,000-50,000) up to the premises
- Up to the premises and 40 l/c/day for category-5 towns/cities within (towns/cities with a population less than 20,000), a distance of 250m with piped system for 75% of the urban population.

With this view, the study tries to assess sources of the water supply, daily water use (l/c/d), fetch length or duration, sufficiency of quantity of water, quality of water etc has been assessed in this survey and the summary tables are given below

## 3.9.1 Water supply

Some of the parameters are treated as weighted and unweighted to compare and see the variation of results. However, both weighted and unweighted results show very minor variation. thus, most analysis is carried out using the unweignted data.

### 3.9.1.1 Mains sources of household (HOUSEHOLDs) water supply

## Regional

Table 3.9.1 provides information about the access (coverage) to improved/protected sources of drinking water of the households for urban, infant towns and rural areas of Tigray region.

The data show that, at the average regional coverage to improved/protected water sources (piped systems, boreholes, protected spring/ hand dug wells, bottled water) is 85.3% for unweghted and 84.7% for the weighted (table 3.9.1and Figure 3.9.1), while the rest 14.7 % (unweighted) and 15.3 % (weighted) get water from unprotected sources (i.e. river, unprotected hand dug well/spring, dam and other un protected sources).

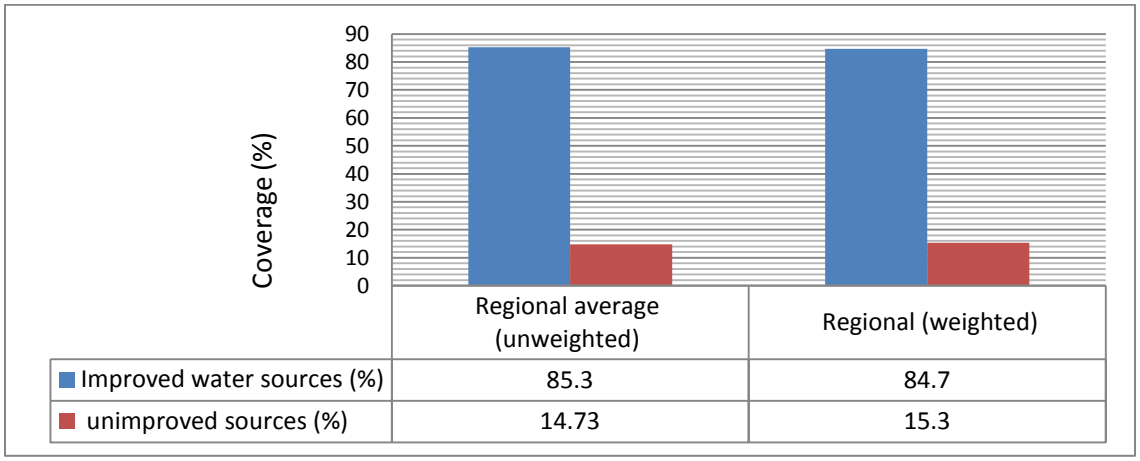



**Figure 3.9. 1: Comparison of weighted and unweighted samples for regional coverage access to improved water sources**

### Urban

The urban people in the region get water from piped systems, protected and unprotected hand dug wells (HDW) and springs, rivers/ponds, bottled water, water truck and other unprotected sources. As can be seen in Table 3.9.1, 82.5% (un weighted) of the respondents received water from a tap inside their home, and another 8.8% used water from a tap in their yard or a shared standpipe as

their primary source. Moreover, 2.01% of respondents regularly collected water from a protected HDW and spring and borehole while 3.8% of the respondents regularly purchased bottled water. The remaining 2.89% of the respondents get water from unimproved sources (unprotected HDW and spring, tanker truck, river and other sources. Thus, the survey result indicted that 97.1% (unweighted) or 96.3% (weighted) of the urban people get water from improved sources (piped system, boreholes, protected HDW and springs, bottled water sources) while 2.89% (unweighted) or 3.7% (weighted) get water from unimproved water sources.

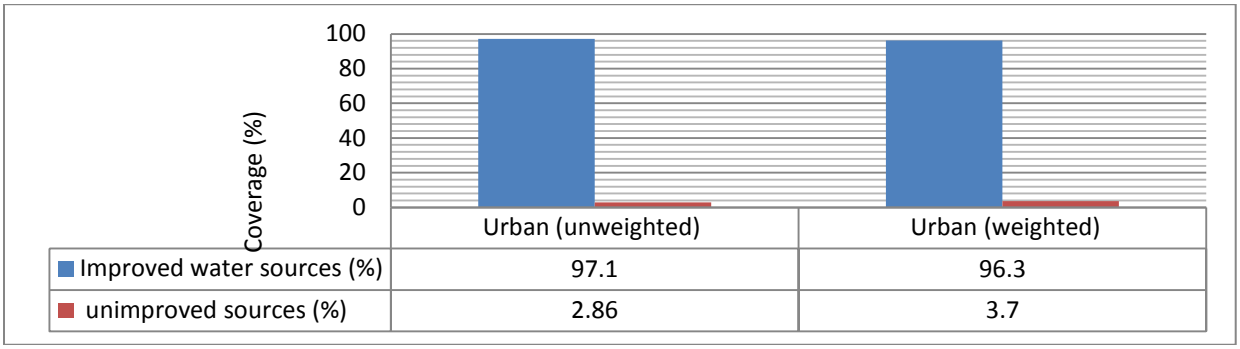



**Figure 3.9. 2: Comparison of weighted and unweighted analysis results for coverage access to improved water sources (major urban)**

## Infant towns

The urban people in the region get water from piped systems, protected and unprotected hand dug wells (HDW) and springs, rivers/ponds, bottled water, water truck and other unprotected sources. As can be seen in Table 3.9.1, 41.2% (unweighted) of the respondents received water from a tap inside their home, and 42.6% used water from a tap in their yard or a shared standpipe as their primary source. Moreover, 4.68% of respondents regularly collected water from a protected HDW and spring and borehole while 0.28% of the respondents regularly purchased bottled water. The remaining 11.24% of the respondents get water from unimproved sources (unprotected HDW and spring, tanker truck, river and other sources. Thus, the survey result indicted that 88.7% (unweighted) or 88.9% (weighted) of the urban people get water from improved sources (piped system, boreholes, protected HDW and springs, bottled water sources) while 11.3% (unweighted) or 11.1% (weighted) get water from unimproved water sources.

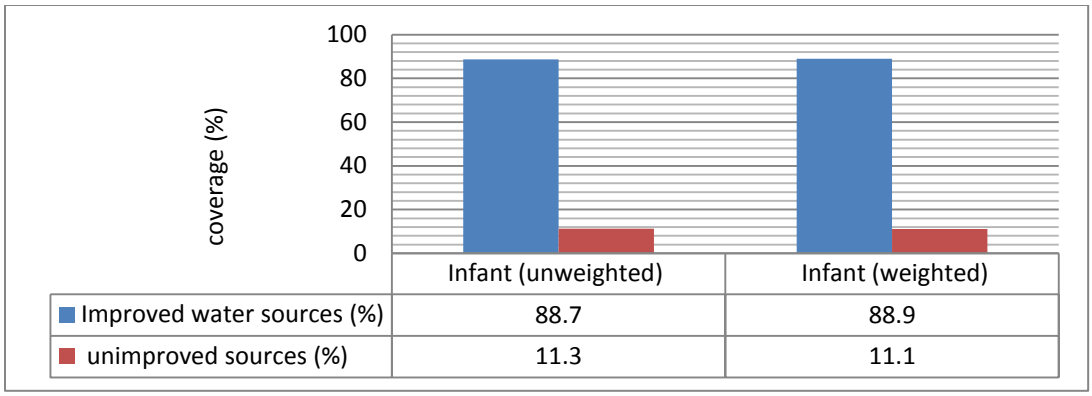



**Figure 3.9. 3: Comparison of weighted and unweighted analysis results for coverage access to improved water sources (infant towns)**

## Rural

The rural people in the region get water from piped systems, protected and unprotected hand dug wells (HDW) and springs, rivers/ponds, bottled water, water truck and other unprotected sources. As can be seen in Table 3.9.1, 6% of the respondents received water from a tap inside their home, and 59.6% used water from a tap in their yard or a shared standpipe as their primary source. Moreover, 11.51`% of respondents regularly collected water from a protected HDW, protected spring and borehole while none of the respondents used bottled water. The remaining 22.9% of the respondents get water from unimproved sources (unprotected HDW and spring, tanker truck, river and other sources. Thus, the survey result indicted that 77.1% of the rural people are getting water from improved sources (piped system, boreholes, protected HDW and springs, bottled water sources) while 22.9% get water from unsafe sources.

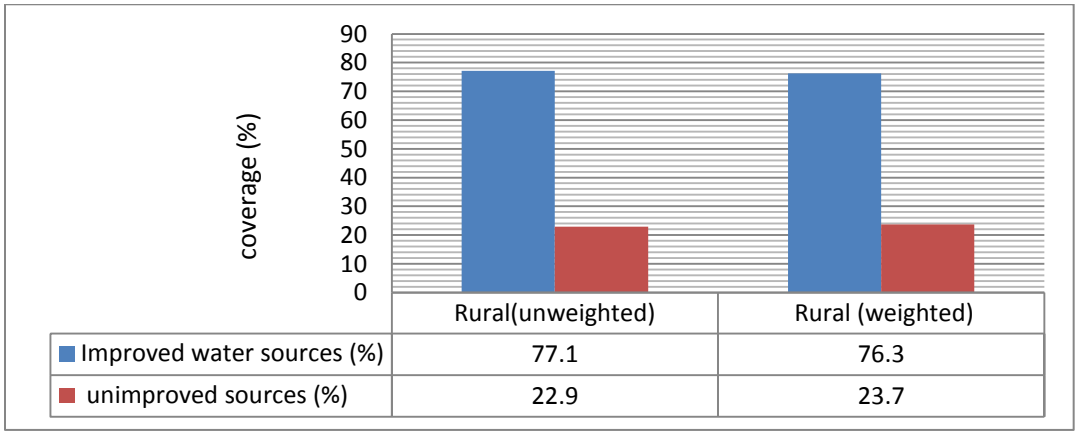



**Figure 3.9. 4: Comparison of weighted and unweighted analysis results for coverage access to improved water sources (Rural areas)**

**Table 3.9. 1: Responses of households (HOUSEHOLDs) on coverage of improved of sources of drinking water, at regional level**

| S.N | Sources of water supply | Weighted | | | | Unweighted | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | **Regional** | **Urban** | **Infant towns** | **Rural** | **Regional** | **Urban** | **Infant towns** | **Rural** |
| | | % | % | % | % | % | % | % | % |
| 1 | Piped system, inside their home (codes #1 & 2) | 36.3 | 82.1 | 42.1 | 6 | 35.9 | 82.5 | 41.2 | 6 |
| 2 | Piped system (from their yard/shared stand pipe; #3) | 39.4 | 8 | 41.9 | 58.5 | 40.5 | 8.8 | 42.6 | 59.6 |
| 3 | Borehole (shallow and deep) | 0.9 | 0.05 | 0.7 | 1.5 | 0.86 | 0.05 | 0.68 | 1.41 |
| 4 | Protected HDW | 3.6 | 2 | 2.4 | 4.9 | 3.6 | 1.7 | 2.4 | 4.8 |
| 5 | Protected Spring | 3.2 | 0.2 | 1.6 | 5.5 | 3.1 | 0.26 | 1.6 | 5.3 |
| 6 | Bottled water | 1.4 | 4 | 0.2 | 0 | 1.3 | 3.8 | 0.28 | 0 |
| 7 | Unprotected HDW | 3.1 | 0.3 | 2.9 | 4.9 | 2.9 | 0.29 | 3 | 4.8 |
| 8 | Unprotected Spring | 8.9 | 0.3 | 4.9 | 15.4 | 8.7 | 0.5 | 4.7 | 15 |
| 9 | River/pond/dam | 0.8 | 0.05 | 0.2 | 1.4 | 0.71 | 0.07 | 0.23 | 1.3 |
| 10 | Tanker truck | 1.7 | 2.7 | 2.3 | 0.8 | 1.4 | 1.7 | 2.6 | 0.91 |
| 11 | Rainwater collection | 0.4 | 0.02 | 0.2 | 0.7 | 0.52 | 0.02 | 0.23 | 0.4 |
| 12 | Other unprotected sources | 0.4 | 0.3 | 0.5 | 0.5 | 0.51 | 0.31 | 0.57 | 0.57 |
| | **Total** | **n = 12940** | **n = 4328** | **n = 1732** | **n = 6880** | **n = 12769** | **n = 4191** | **n = 1757** | **n = 6821** |

**Summary of coverage access to protected water sources**

| | weighted | | | | unweighted | | | |
|---|---|---|---|---|---|---|---|---|
| **Sources of drinking water** | **Regional** | **Urban** | **Infant** | **Rural** | **Regional** | **Urban** | **Infant** | **Rural** |
| Improved water sources coverage (%) | 84.7 | 96.3 | 88.9 | 76.3 | 85.3 | 97.1 | 88.7 | 77.1 |
| Unimproved sources coverage (%) | 15.3 | 3.7 | 11.1 | 23.7 | 14.73 | 2.86 | 11.3 | 22.9 |

### 3.9.1.2 Water supply access coverage [household level existing water quantity and per capita water use (l/c/d)]

**Water supply access coverage**

The water supply access coverage (table 3.9.2c) for urban areas was calculated from those households who have pipe connection and use daily water of >=60l/c/d (for major towns), >=30l/c/d (for infant towns), while for the rural areas; the coverage was determined taking in account 1km distance from the water sources and daily water consumption of >=25l/c/d as a standard. The daily water consumption data (liter/day/person) and distance to water points are obtained from the respondents through questioner.

Besides to pipe connection, hand pump fitted boreholes, improved springs, pipe systems sources are considered in the coverage calculation in the infant towns and rural areas. Additionally, outlier values of the daily water consumption (<5 l/c/d) are not considered for the coverage calculations in our approach. Accordingly, the regional, urban, infant towns and rural areas are calculated to be 13.94, 5.53, 10.1 and 21.5 respectively (table 3.9.2.c). While the coverage calculated by the regional water bureau for 2010 E.C are 61.19%, 59.05% and 60.62% for rural, urban and regional respectively. Comparing the coverage calculated by our survey and the water bureau, they have very big variation .This variation could be due the fact that: (1) the water bureau calculated the coverage using the daily production of water (l/c/d), not the daily consumption. The limitation of this approach is that it is very difficult to know whether all the produced water reached the community or not. It is thus obvious that such approach may exaggerate the coverage values, (2) in our case the input data used for the coverage calculation ( e.g. the daily water consumption per capita per day) is collected using questioner from the household. So, such data is exposed to subjectivity of the respondents and hence underestimated resulting in the lower value of coverage. Of course, many efforts have been done to minimize the error by asking to show their monthly water bill in the urban and number of jerican used per day in the rural areas. From these findings, we can understand that the actual value of access to water coverage lies between the results of the two approaches. Hence, it is better if the bureau calculates the actual access coverage by adopting the daily water consumption from water bills

used by each household in towns, and daily record of the number of jericans used the rural water points.

Furthermore, the coverage to the pipe connection in urban/infant towns, as well as the distance (=< 1km) to water points in the rural areas are also calculated and results are provided in table 3.9.2d. In this calculation the daily water consumption is not used. So, as shown in Table 3.9.2d, 41.5% in the regional level, 52 in urban and 41.2% in the infant towns are connected piped system. Similarly 34.7% of the rural respondents are getting water in less than 1km distance.

**Regional**

More than 91.6% (un weighted) or 91.9 % (weighted) respondents getting less than 25 l/c/d (Table 3.9.2) at regional level displaying water access coverage in the region is very far less than the national and regional standard set by the regional water bureau and in GTP-2. Moreover, Table 3.9.3 indicated 63.2%, 7% and 4 % are taking bath using jokes, private and shared shower respectively while 18.6% washing their body in rivers.

**Urban**

As mentioned above, water supply coverage of major urban has a big gap in achieving the targeted amount of water to the community. Thus, 89% (un weighted) or 89.7% (weighted) and 7.4 % (un weighted) or 7.1% (weighted) of the respondents get a volume of water which is less than 25 and 25 - 40 litres per capita per day (l/c/d) respectively (Table 3.9.2a-b). While remaining 1.8%/1.5% (unweighted/weighted) and 1.25 %/1.7% (unweighted/weighted) of the respondents fall in the range of 40-60 and > 60 l/c/d which is very far less than the national standard set in regional water bureau and GTP-2. Similarly major sources of water and /or means for bathing are also provided in Table 3.9.3.a-c. Most people wash their body from piped water using joke (49.5%), Private shower (20.3%), shared shower (12.5), private tube/trough (10.3% and from others (Table 3.9.3)

**Infant towns**

the survey result confirmed that 88.85/0.89.1% (unweighted/weighted) and 8.6 %/8.3% (unweighted/weighted) of the respondents get a volume of water which is less than 25 and 25 - 40 litres per capita per day (l/c/d) respectively (Table 3.9.2a-b). While remaining 1.48% (unweighted) and 0.98 % (unweighted) of the respondents fall in the range of 40-60 and > 60 l/c/d which is very far less than the national and regional standard set in GTP-2. Similarly major

sources of water and /or means for bathing are also provided in Table 3.9.3. Most people wash their body from piped water using joke (74%), river (12.5), Private shower (6.7%) , shared shower (2.5), private tube/trough (3.3% and from others (Table 3.9.3)

**Rural**

As mentioned above, the water supply coverage of rural areas is 10.1% that satisfies the GTP-2 requirement. This is also ratified that 94% of respondents obtain less than 25 litres per capita per day (l/c/d) access to water (Table 3.9.2) which is very far less than the national and regional standard set in water bureau and GTP-2 for rural areas. While remaining 5.14% and 0.95 % of the respondents fall in the range of 25 - 50 and > 50 l/c/d respectively. In the rural area, 67.6% and 28.5% are bathing using joke and from rives, whereas the rest of the community bath from shared and private shower (Table 3.9.3).

**Table 3.9. 2a: Responses of households (HOUSEHOLDs) on drinking water consumption (l/c/d), at regional level**

| | | Weighted values | | | |
|---|---|---|---|---|---|
| S.N | water volume (l/c/d) | Region | Urban | Infant towns | Rural |
| | | % | % | % | % |
| 1 | <25 | 91.9 | 89.7 | 89.1 | 94 |
| 2 | 25.1-40 | 6 | 7.1 | 8.3 | 4.8 |
| 3 | 40.1-50 | 0.6 | 0.9 | 1 | 0.4 |
| 4 | 50.1-60 | 0.4 | 0.7 | 0.5 | 0.3 |
| 5 | 60.1-80 | 0.5 | 0.7 | 0.6 | 0.3 |
| 6 | 80.1-100 | 0.2 | 0.4 | 0.3 | 0.1 |
| 7 | >100 | 0.3 | 0.6 | 0.3 | 0.2 |
| **Total** | | n= 12310 | n=4168 | n=1666 | n=6476 |

**Table 3.9. 3b: Responses of households (HOUSEHOLDs) on drinking water consumption (l/c/d), at regional level**

| Unweighted values | | | | |
|---|---|---|---|---|
| water volume (l/c/d) | **Region (**% | **Urban (**% **)** | **Infant towns (%)** | **Rural (%)** |
| =<25 | 91.6 | 89 | 88.85 | 94 |
| 25.1- 40 | 6.2 | 7.4 | 8.6 | 4.77 |
| 40.1-50 | 0.67 | 1.03 | 0.95 | 0.37 |
| 50.1- 60 | 0.495 | 0.77 | 0.53 | 0.31 |
| 60.1- 80 | 0.5 | 0.82 | 0.5 | 0.28 |
| 80.1-100 | 0.227 | 0.43 | 0.24 | 0.09 |
| >100 | 0.33 | 0.6 | 0.24 | 0.17 |

**Table 3.9.2c. Summary of water supply access Coverage (%)**

| Coverage (%) | Regional | Urban (major towns) | Infant town | Rural |
|---|---|---|---|---|
| | 13.94 | 5.53 | 10.1 | 21.5 |

Table 3.9.2d; Summary of water supply Coverage (using connection to piped system in urban and infant towns , and distance = <1km in rural areas)

| | Regional | Urban (major towns) | Infant town | Rural |
|---|---|---|---|---|
| Coverage (%) | 41.5 | 52.0 | 41.2 | 34.7 |

**Table 3.9. 4: Responses of households (HOUSEHOLDs) on source water and mechanism of bathing, at regional level**

| Sources of water for bathing | Regional | Urban | Infant town | Rural |
|---|---|---|---|---|
| | % | % | % | % |
| River | 18.6 | 1.6 | 12.2 | 28.5 |
| Private tube/trough | 4.8 | 10.3 | 3.3 | 2.4 |
| Shared tube/trough | 0.64 | 1.9 | 0.21 | 0.11 |
| Private shower | 7 | 20.3 | 6.7 | 0.4 |
| Shared shower | 4 | 12.5 | 2.5 | 0.22 |
| Shared tube and trough shower | 0.59 | 1.1 | 0.58 | 0.33 |
| using joke | 63.2 | 49.5 | 74 | 67.6 |
| Common shower | 0.43 | 0.96 | 0.32 | 0.19 |
| none | 0.71 | 1.9 | 0.16 | 0.25 |

### 3.9.1.3 Fetch length (distance) to water points

**Regional**

Table 3.9.4a and b presents unweighted and weighted information on the fetch length (distance) to water points of the households. Results showed that both weighted and unweighted have nearly the same values. Households were asked how much time they travel to fetch water. They were also asked ‘who is responsible from the family in fetching water ‘from their main sources (Table 3.9.5). Results revealed that 57.8% of the respondents are traveling less than 15 minute ( about 1.25km) while the rest 42,2% are travelling greater than 15 minute to get water from their sources (Table 3.9.4). Moreover, 61.2% of respondents show that the Adult females (Table 3.9.5) are responsible in bringing water from the sources indicating that females are still with more burdens in the society at regional level

**Urban**

The round trip to fetch water from the water points is assessed and analysed. During this survey respondents are asked how long it takes to walk to their households’ main drinking water source. This measurement is used as an indicator of water access and result is presented in Table 3.9.4. As can be seen in this table, 87.8% and 8.22% of the house hold spent time less than 15 minute and 15-30 minutes respectively to access water. Moreover, 68.2% of the respondents also confirmed that adult female are involved in collecting water from the source suggesting that still females have more burden than male in the household (Table 3.9.5). This will obviously have an effect the woman’s ability to engage in other income generating activities, cultural and political involvement, rest and recreation.

**Infant towns**

With reference to table 3.9.4, 72.6% and 19.2% of the house hold spent time less than 15 minute and 15-30 minutes respectively to access water in the infant towns. Moreover, 58.2% of the respondents also confirmed that adult female are involved in collecting water from the source suggesting that still females have more burden than male in the household (Table 3.9.5). This will obviously have an effect the woman’s ability to engage in other income generating activities, cultural and political involvement, rest and recreation.

**Rural**

Results for the rural areas, presented in table 3.9.4 reveal that 34.7% and 41.3% of the house hold spent time less than 15 minute and 15-30 minutes respectively to access water while the rest 24% travel for more than 30min to get water. Moreover, 58.3% of the respondents also confirmed that adult female are involved in collecting water from the source suggesting that still females have more burden than male in the household (Table 3.9.5). This will obviously have an effect the woman's ability to engage in other income generating activities, cultural and political involvement, rest and recreation.

**Table 3.9. 5a: Respondents on time spent to fetch water from main water source, at zone level**

| | | Unweighted | | | |
|---|---|---|---|---|---|
| S.N | Time spent to fetch water (minute) | Regional % | Urban % | Infant towns % | Rural % |
| 1 | <15 | 57.8 | 87.8 | 72.7 | 34.7 |
| 2 | 15 - 30 | 27.1 | 8.22 | 19.2 | 41.3 |
| 3 | 30 - 60 | 10.2 | 2.5 | 5.8 | 16.3 |
| 4 | > 60 | 4.9 | 1.5 | 2.3 | 7.7 |

Table 3.9.4b: Respondents on time spent to fetch water from main water source, at zone level

| | | Weighted | | | |
|---|---|---|---|---|---|
| **S.N** | **Time spent to fetch water (min.)** | **Regional** % | **Urban** % | **Infant T.** % | **Rural** % |
| 1 | <15 | 58 | 88.5 | 72.6 | 35 |
| 2 | 15 - 30 | 27.1 | 8 | 19.2 | 41 |
| 3 | 30 - 60 | 10 | 2.3 | 5.8 | 16 |
| 4 | > 60 | 4.9 | 1.3 | 2.3 | 8 |
| | Total | N = 12296 | N =4154 | N = 1667 | N = 6476 |

**Table 3.9. 6: Respondents on who fetch water from the from the house hold, at regional level**

| S.N | Respondents | Regional % | Urban % | Infant town % | Rural % |
|---|---|---|---|---|---|
| 1 | Adult male | 25.1 | 24.3 | 24.4 | 25.8 |
| 2 | Adult female | 61.2 | 68.2 | 58.2 | 58.3 |
| 3 | Female childe (<15 age) | 9.8 | 6.5 | 11.6 | 11 |
| 4 | Male childe (<15 age) | 3.9 | 1 | 5.8 | 4.9 |

### 3.9.1.4 Reliability and adequacy of household water supply

**Region**

Tables 3.9.6, 3.9.7 and 3.9.8 summarizes adequacy of drinking water supply, water supply service interruptions and their frequencies respectively. Results in those tables showed that 48.7 of the regional respondents said the existing water supply is not adequate. Similarly, 55% of the household surveyed display there is frequent water service interruption in the region.

**Urban**

Adequacy and reliability assessment of the water supply in the household also carried out. More than 59% respondents said that the existing water supply is not adequate while 40.6 % respondents reported that the water supply is enough (Table 3.9.6). The study indicated that there are frequent supply interruptions due to several reasons.

Of those households that had a household tap, 76% respondents experienced service interruptions with an average of 21.9 days in three months (Table 3.9.7 and 3.9.8), Which means water is not available for an average of 7.3 days a month. Water service interruptions are worst in Mekelle and central zones than the other zones (Table 3.9.8).

**Infant towns**

Adequacy and reliability assessment of the water supply carried out indicated that more than 51.2 % respondents said that the existing water supply is not adequate while 48.8% respondents reported that the water supply is enough (Table 3.9.6). The study indicated that there are frequent supply interruptions due to several reasons.

Of those households that had a household tap, 59% respondents experienced service interruptions with an average of 15.7 days in three months (Table 3.9.7 and 3.9.8), Which means water is not available for an average of 5.2 days a month. Water service interruptions are worst in Mekelle and central zones than the other zones (Table 3.9.8).

**Rural**

More than 41.1% of the rural respondents said that the existing water supply is not adequate while 58.9 % respondents reported that the water supply is enough (Table 3.9.6). The study indicated that there are significant supply interruptions due several reasons.

Of those households surveyed, 43.7% the rural respondents experienced service interruptions with an average of 14.7days in three months (Table 3.9.7 and 3.9.8), which means water is not available for an average of 5 days a month.

**Table 3.9. 7: Responses of households (HOUSEHOLDs) on adequacy of drinking water supply, at regional level**

| S.N | Response of HOUSEHOLDs | Regional | Urban | Infant | Rural |
|---|---|---|---|---|---|
| | | % | % | % | % |
| 1 | yes | 51.3 | 40.6 | 48.8 | 58.9 |
| 2 | No | 48.7 | 59.4 | 51.2 | 41.1 |

**Table 3.9. 8: Responses of households (HOUSEHOLDs) on water supply interruption in three months, at regional level**

| S.N | Response of HOUSEHOLDs | Regional | Urban | Infant | Rural |
|---|---|---|---|---|---|
| | | % | % | % | % |
| 1 | Yes, there is water supply interruption | 55 | 76 | 59 | 40 |
| 2 | No water supply interruption | 45.5 | 24.3 | 40.8 | 60.3 |

**Table 3.9. 9: Response households (HOUSEHOLDs) on frequency of water supply interruption in three months, at regional levels**

| water interruption (in days) frequency in three months (in days) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Regional** | | **Urban** | | **Infant towns** | | **Rural** | |
| Obs. | Mean | Obs. | Mean | Obs. | mean | Obs. | Mean |
| 6726 | 18.23 | 3171 | 21.9 | 999 | 15.7 | 2556 | 14.7 |

### 3.9.1.5 Household water quality (physical) and treatment

**Region**

The physical water quality of the household is surveyed using simple physical parameters such as salty nature, turbidity, odor, color and the likes and provided in Table 3.9.9. Accordingly, only 69.7% of the regional respondents get good quality water in the region. Out of those households who treated their drinking water at home did so by adding chemical (e.g. chlorine, 'wuha-agar') (63.9% of respondents), boiling (22% respondents) and other techniques of treating mechanism (Table 3.9.11)

**Urban**

As indicated in Table 3.9.9, 66.1 % of the respondents get good quality water while 33.9 % gets impure water for their drinking and cleaning purposes. Of those households that are using impure water, 80.8% use untreated water which could be a cause for water born diseases (Table 3.9.10). Out of those households who treated their drinking, 74.1% and 13 % of the respondents showed that they treat the water by adding chemicals (e.g. chlorine, 'wuha-agar') and boiling respectively (Table 3.9.11)

**Infant towns**

As presented in Table 3.9.9, 69.8 % of the respondents get good quality water while 30.2 % gets impure water for their drinking and cleaning purposes. Of those households that are using impure water, 90.6% use untreated water which could be a cause for water borne diseases (Table 3.9.10). Out of those households who treated their drinking, 69.8% and 22 % of the respondents showed that they treat the water by adding chemicals (e.g. chlorine, 'wuha-agar') and boiling respectively (Table 3.9.11)

**Rural**

The physical water quality of the household is surveyed using simple physical parameters such as salty nature, turbidity, odor, color and the likes and provided in Table 3.9.9. This table indicated that 69.3% of the respondents get good quality water while 30.7 % gets impure water

for their drinking and cleaning purposes. Of those households that are using impure water, 88.4% use untreated water which could be a cause for water borne diseases (Table 3.9.10). The major water treatment mechanisms used in the rural area includes adding chemicals (e.g. chlorine, 'wuha-agar') (54.8%) and boiling (29.1%) as given in Table 3.9.11.

**Table 3.9. 10: Responses of households (HOUSEHOLDs) on quality of water, at regional level**

| S.N | Quality parameters used (physical) | Regional | Urban | Infant town | Rural |
|---|---|---|---|---|---|
| | | % | % | % | % |
| 1 | Pure | 69.7 | 66.1 | 79.7 | 69.3 |
| 2 | Salty | 8.2 | 17.5 | 5.1 | 3.4 |
| 3 | Turbidity (Muddy water) | 14.4 | 10.6 | 9.3 | 17.9 |
| 4 | has odor | 2.63 | 1.3 | 2 | 3.6 |
| 5 | Uncommon taste | 1.9 | 0.68 | 1.2 | 2.9 |
| 6 | Colored water | 2.3 | 3.5 | 1.6 | 1.7 |
| 7 | Other | 0.87 | 0.4 | 1.1 | 1.1 |

**Table 3.9. 11: Responses of households (HOUSEHOLDs) on drinking water treatment, at regional level**

| S.N | Response of HOUSEHOLDs | Regional | Urban | Infant T. | Rural |
|---|---|---|---|---|---|
| | | % | % | % | % |
| 1 | Yes | 13.9 | 19.2 | 9.4 | 11.6 |
| 2 | No | 86.1 | 80.8 | 90.6 | 88.4 |

**Table 3.9. 12: Respondents on the use of drinking water treatment mechanisms**

| S.N | Mechanisms used to treat water | Region | Urban | Infant town | Rural |
|---|---|---|---|---|---|
| | | % | % | % | % |
| 1 | Boiling | 22 | 13 | 22 | 29.1 |
| 2 | Add chemicals (e.g. chlorine,Woha-gar) | 63.9 | 74.1 | 69.8 | 54.8 |
| 3 | filtering using cloth | 6.6 | 2.8 | 5.5 | 9.7 |
| 4 | use filtering equipment | 3.3 | 2.6 | 1.1 | 4.4 |
| 5 | Other ( e.g. settling) | 4.1 | 7.5 | 1.6 | 2 |

### 3.9.1.6 Major problems identified in the household water supply

**Region**

Table 3.9.12 presents the major challenges of water supply sector in the region at household level. Hence, the major challenges of the water supply sector at regional level includes interruption of water supply (38.9%), coverage (17.3%), maintenance and related (15.5%) Drying of sources (12.2%), poor quality (11.6), and high cost (4.8%)

**Urban**

The major problems in the town water supply services (Table 3.9.12) includes sustainability problem (frequent interruption, drying of sources), less coverage, and poor quality. For instance, the survey carried out on water supply interruption shows more than 75% of the respondents (Table 3.9.7) answered that there is a critical water supply failure (interruption) in all big towns of the region. The key informants and Focus group discussion (FGD) carried out in Mekelle and other zonal towns indicate that the major cause for the interruption of the water supply consists of shortage of water at their sources, fast population growth and urbanization, frequent break down of pipelines and pumps as well as lack of technical skilled labor to maintain them

**Infant towns**

The major challenges of the water supply sector for the infant towns as presented in table 3.9.12 includes interruption of water supply (41.7%), coverage (17.2%), maintenance and related (15.2%), Drying of sources (11.6%), poor quality (6.8), and high cost (7.5%)

**Rural**

The major problems in the Rural water supply services (Table 3.9.12) includes sustainability problem (frequent interruption, drying of sources), less coverage, and poor quality. For instance, the survey result in Table 3.9.12 showed that the critical water supply problems consists interruption (28.4 %), coverage (15.4%), others (e.g. maintenance problems pipe lines, pumps, fast population increase etc) (23.5%), poor quality (10.9%).The key informants carried out in some of the infant towns in Southern and other areas indicate that the major cause for the interruption of the water supply consists of shortage of water at their sources, fast population growth and urbanization, frequent break down of pipelines and pumps as well as lack of technical skilled labor to maintain them

**Table 3.9. 13: Response of HOUSEHOLDs on major problem of water supply, regional level**

| S.N | List of problems | Regional | Urban | Infant | Rural |
|---|---|---|---|---|---|
| | | % | % | % | % |
| 1 | Interruption of water supply | 38.9 | 54.4 | 41.7 | 28.4 |
| 2 | Drying of sources | 12.2 | 7.3 | 11.6 | 15.4 |
| 3 | poor quality | 11.6 | 14.7 | 6.8 | 10.9 |
| 4 | high cost | 4.7 | 3.2 | 7.5 | 4.8 |
| 5 | coverage | 17.3 | 17.8 | 17.2 | 17 |
| 6 | Others (maintenance of pipe lines, pumps, fast population increase etc) | 15.5 | 2.6 | 15.2 | 23.5 |

### 3.9.1.7 Water costs

**Regional**

Tables 6.13, 6.14 and 6.15 deals on the response of households whether they pay for water or not, monthly water payment categories and on whether the existing tariff is expensive or not respectively. As indicated in those tables, 76.5 % of the respondents pay for water, and 82.4% of these respondents pay less than or equal to 50birr per month. Also, 72.4% of the regional respondents said the current tariff is not expensive

**Urban**

Most of the people (86.8%) pay for the water supply service they are getting (Table 3.9.13) while the reaming 13.2% did not directly pay due to various reasons described in Table 3.9.12 above. 43% and 32.7 % of the respondents pay ≤ 25 and 25-50 birr/month respectively (Table 3.9.14), whereas 14.2% and 6.3 % pay 50-100 and 100-200/birr month. However, as confirmed from Focus group discussion residents are paying additional payment of 5-10 birr/20 liter Jerican or 70-80 birr per barrels when there is no water from the system.

The regional average monthly payment for urban water service for those who did pay was 54.1 birr. Moreover, the existing tariff is also checked and 68.1% of the respondents (Table 3.9.15) indicated that the existing tariff is fair and not expensive. Similarly, 48.83% of the respondents (Table 3.9.17) are willing to pay additional costs if the additional investment to improve the quantity and quality of water is carried out by the government.

As a summary, most towns in the region are facing unreliable and inadequate supply of water and sanitation services. Some of the major reasons include limitation of water sources, inadequate administrative and technical skills (e.g. system leakage, frequent supply interruption etc), high population growth, and urban expansion.

The average monthly payment is relatively higher Western and North Western zones followed by Mekelle and Central zones while the minimum average payment is recorded in Sothern.

**Infant towns**

Most of the people (86.4%) pay for the water supply service they are getting (Table 3.9.13) while the reaming 13.6% did not directly pay due to various reasons such as (1) payment is included in the house rents, some household use spring/river water, or hand dug wells as sources for their domestic use. Most people (48.5%) of the respondents pay ≤ 25 birr/month followed by 24.7% and 15% respondents pay 25-50 and 50-100 birr/month respectively (Table 3.9.14).

61 % of the respondents (Table 3.9.15) indicated that the existing tariff is fair and not expensive. Also, 24.9% of the respondents (Table 3.9.17) are willing to pay additional costs if the additional investment to improve the quantity and quality of water is made by the government.

As a summary, most towns in the region are facing unreliable and inadequate supply of water and sanitation services. Some of the major reasons include limitation of water sources, inadequate administrative and technical skills (e.g. system leakage, frequent supply interruption etc), high population growth, and urban expansion.

**Rural**

Most of the people (67.2%) pay for the water supply service they are getting (Table 3.9.13) while the reaming 32.8% did not directly pay due to various reasons such as (1) payment is included in the house rents, some household use spring/river water, or hand dug wells as sources for their domestic use. Most people (81.5%) of the respondents pay ≤ 25 birr/month followed by 9.6% and 4.7% respondents pay 25-50 and 50-100 birr/month respectively (Table 3.9.14).

88 % of the respondents (Table 3.9.15) indicated that the existing tariff is fair and not expensive. Also, 28.9% of the respondents (Table 3.9.17) are willing to pay additional costs if the additional investment to improve the quantity and quality of water is carried out by the government.

As a summary, most towns in the region are facing unreliable and inadequate supply of water and sanitation services. Some of the major reasons include limitation of water sources, inadequate administrative and technical skills (e.g. system leakage, frequent supply interruption etc), high population growth, and urban expansion.

**Table 3.9. 14: Response of Households whether residents of the towns pay for water or not (Do you pay for water?)**

| Responds of HOUSEHOLDs | Regional | Urban | Infant town | Rural |
|---|---|---|---|---|
| | % | % | % | % |
| **No** | 23.5 | 13.25 | 13.6 | 32.8 |
| **Yes** | 76.5 | 86.8 | 86.4 | 67.2 |

**Table 3.9. 15: Responses of Households and monthly payment for water services**

| S.N | Monthly water payment category (birr) | Regional | Urban | Infant towns | Rural |
|---|---|---|---|---|---|
| | | % | % | % | % |
| 1 | <=25 | 61.6 | 43 | 48.5 | 81.5 |
| 2 | 25.1-50 | 20.8 | 32.7 | 24.7 | 9.6 |
| 3 | 50.1 – 100 | 10 | 14.2 | 15 | 4.7 |
| 4 | 100.1 – 200 | 4.9 | 6.3 | 7.8 | 2.8 |
| 5 | 200.1 – 400 | 1.7 | 2.7 | 1.9 | 0.85 |
| 6 | >400 | 1 | 1 | 2.2 | 0.62 |

**Table 3.9. 16: Respondents HOUSEHOLDS on tariff of drinking water supply at regional level**

| | Is the current tariff expensive? | | | |
|---|---|---|---|---|
| Response of HOUSEHOLDs | Regional | Urban | Infant town | Rural |
| | % | % | % | % |
| No | 72.4 | 68.14 | 61 | 88 |
| Yes | 27.6 | 31.83 | 39 | 22 |

**Table 3.9. 17: Respondents HOUSEHOLDS on Monthly average payment for drinking water supply at zonal and regional level**

| S.N | Zone | Monthly average payment for water | | | | | |
|---|---|---|---|---|---|---|---|
| | | Regional | | Urban | | Rural | |
| | | Obs. | mean | Obs. | Mean | Obs. | Mean |
| 1 | Mekelle | 2,853 | 34.66 | 1288 | 46.5 | 1,565 | 22.81 |
| 2 | Southern | 1,779 | 28.3 | 561 | 37.2 | 1,218 | 19.4 |
| 3 | Eastern | 1,411 | 51.95 | 436 | 41 | 975 | 62.9 |
| 4 | Central | 1,538 | 35.05 | 657 | 45.6 | 881 | 24.5 |
| 5 | West | 836 | 64.8 | 229 | 110 | 607 | 19.6 |
| 6 | North west | 1,027 | 92.8 | 466 | 92.6 | 561 | 93 |
| **Regional level average** | | **9,445** | **44.8** | **3637** | **54.1** | **5,808** | **35.5** |

**Table 3.9. 18: Respondents HOUSEHOLDS on willingness to pay additional for additional investment on the drinking water supply, at regional level**

| S.N | Response of HOUSEHOLDs | **Regional** | **Urban** | **Infant town** | **Rural** |
|---|---|---|---|---|---|
| | | % | % | % | Percent |
| 1 | No | 65.1 | 51.17 | 75.1 | 71.1 |
| 2 | Yes | 34.9 | 48.83 | 24.9 | 28.9 |

## 3.9.2. Irrigation

### 3.9.2.1 Availability and types of Irrigation

Water is also very important for irrigation practice to boost the agricultural production. Hence a baseline survey was carried out to assess the situation of water supply for irrigation purposes.

Overall the irrigation is being practiced as primary source of the livelihood in in rural areas but less practiced in the towns. Results of the survey are provided below in table format with their brief description at regional level, urban infant towns and rural areas

**Regional**

The surveyed households and their weighted values are provided in table 3.9.19a-b, and show no significant differences. Analysed results (table 3.9.19a-b) showed that the irrigation coverage in the region is 3.9% i.e. only 3.9% are engaged in irrigation practices at regional level.

The types of irrigations experienced in the region includes both supplementary irrigation weighted (41.6%) and full irrigation weighted (58.4%) as described in Table 3.9.20b.

**Urban**

Overall the irrigation is not being practiced as primary source of the livelihood in urban areas. In surveyed area very small scale irrigation are present. Results are provided below in table format with their brief description the survey showed that the irrigation coverage in the urban area is 1.2%. i.e only 1.2% of the urban respondents are engaged in irrigation practices (table 3.9.19b) suggesting irrigation is not the main stay of life in towns.

The types of irrigations experienced in the surveyed towns includes both supplementary irrigation ( 40.9%) and full irrigation ( 59.1%) as described in Table 3.9.20b.

**Infant towns**

Similarly, the survey results of availability and type of irrigation in the infant towns are provided in tables 3.9.19 and 20. the irrigation coverage in the infant towns is 3.24% i.e. only 3.24% of respondents in the infant towns are engaged in irrigation practices (Table 3.9.19b) suggesting irrigation is relatively common practice in the infant towns than the major urban. The types of irrigations experienced in the surveyed towns includes both supplementary irrigation ( 35.2%) and full irrigation ( 64.8%) as described in Table 3.9.20b.

**Rural**

the survey revealed that the n coverage in the rural areas is 5.84% i.e. only 5.84% respondents in the rural areas are engaged in irrigation practices (table 3.9.19b) suggesting irrigation is relatively more practiced in the rural areas than in towns.

The types of irrigations experienced in the surveyed rural areas includes both supplementary irrigation ( 42.6%) and full irrigation ( 57.4%) as described in Table 3.9.20b.

**Table 3.9. 19a: Responses of households (HOUSEHOLDs) on availability of irrigation scheme**

| Unweighted values | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Response of HOUSEHOLDs | Regional | | Urban | | Infant T. | | Rural | |
| | No. HOUSEHOLDs | % | No. HOUSEHOLDs | % | No. HOUSEHOLDs | % | No. HOUSEHOLDs | % |
| No | 11820 | 96.1 | 4102 | 98.7 | 1635 | 96.9 | 6083 | 94.2 |
| Yes | 480 | 3.9 | 53 | 1.3 | 52 | 3.1 | 375 | 5.8 |
| Total | 12300 | - | 4,155 | - | 1687 | | 6458 | |

Table 3.9.19b: Responses of households (HOUSEHOLDs) on availability of irrigation scheme

| Weighted values | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Response of HOUSEHOLDs | Regional | | Urban | | Infant town | | Rural | |
| | No. HOUSEHOLDs | % | No. HOUSEHOLDs | % | No. HOUSEHOLDs | % | No. HOUSEHOLDs | % |
| No | 11825 | 96.1 | 4114 | 98.8 | 1612 | 96.76 | 6099 | 94.16 |
| Yes | 480 | 3.9 | 48 | 1.2 | 54 | 3.24 | 378 | 5.84 |
| Total | 12305 | - | 4162 | - | 1666 | | 6477 | |

**Table 3.9. 20a: Responses of households (HOUSEHOLDs) on type of irrigation), at regional level**

| Unweighted values | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| S.N | type of irrigation | Region | | Urban | | Infant town | | Rural | |
| | | No. HOUSEHOLDs | % | No. HOUSEHOLDs | % | No. HOUSEHOLDs | % | No. HOUSEHOLDs | % |
| 1 | full irrigation | 274 | 57.6 | 31 | 63.2 | 32 | 61.5 | 211 | 56.3 |
| 2 | supplementary irrigation | 202 | 42.4 | 18 | 36.6 | 20 | 38.5 | 164 | 43.7 |
| | **total** | **476** | | **49** | | **52** | | **375** | |

Table 3.9.20b: Responses of households (HOUSEHOLDs) on type of irrigation), at regional level

| Weighted values | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| S.N | type of irrigation | Region | | Urban | | Infant town | | Rural | |
| | | No. HOUSEHOLDs | % | No. HOUSEHOLDs | % | No. HOUSEHOLDs | % | No. HOUSEHOLDs | % |
| 1 | full irrigation | 278 | 58.4 | 26 | 59.1 | 35 | 64.8 | 217 | 57.4 |
| 2 | supplementary irrigation | 198 | 41.6 | 18 | 40.9 | 19 | 35.2 | 161 | 42.6 |
| | **Total** | **476** | | **44** | | **54** | | **378** | |

### 3.9.2.2 Water Sources for irrigation

**Regional**

As shown in table 3.9.21a, the main source of water supply for irrigation in Tigray region are found to be river (33.3%), spring (26.6), dam (14.6%), Private Hand dug well (HDW) (13.5%), communal HDW (5.6) and Deep well (2.7%). That means, the houses holds use sources of water for irrigation 76.9% from surface water (River, spring and pond) and 21.8% from groundwater (private and communal hand dug wells and deep wells) to irrigate their land. Table 3.9.1b also indicated that 176 landholders use river water to irrigated 83.5ha, 133 landholders use spring water to irrigate 67.2ha land, and 76 landholders use dams to irrigate 48.3ha land etc. at regional level.

**Urban**

Data presented in Table 3.9.21 indicate various water supply sources of irrigation. The main sources of water supply for irrigation in the urban area are found to be river (22.9%), spring (22.9), Private Hand dug well (HDW) (16.71%), communal HDW (10.4), Deep well (10.4%), dam (10.4%). That means, the houses holds use sources water for irrigation 58.3 % from surface water (River, spring and pond) and 37.5% from groundwater (private and communal hand dug wells and deep wells) to irrigate their land. As presented in table 3.9.1b, 11 landholders use river water to irrigated 5.6ha, 11 landholders use spring water to irrigate 8.8ha land, and 5 landholders use dams to irrigate 14.2ha land etc. in major urban.

**Infant towns**

Data presented in Table 3.9.21 indicate various water supply sources of irrigation. The main sources of water supply for irrigation in the study area was found to be river (28.8%), dam (23.7%), Spring (22), Private Hand dug well (HDW) (15.3), communal HDW (6.8), Deep well (1.7%),. That means, the houses holds use sources water for irrigation 76.2 % from surface water (River, spring and pond) and 23.8% from groundwater (private and communal hand dug wells and deep wells) to irrigate their land. As presented in table 3.9.1b, 17 landholders use river water to irrigated 8.2ha, 14 landholders use dam water to irrigate 10.7ha land, and 13 landholders use dams to irrigate 5ha land etc. in major in the infant towns

**Rural**

Data presented in indicate various water supply sources of irrigation. The main source of water supply for irrigation (Table 3.9.21) in the rural area are found to be river (35.2%), spring (28.1), dam (14%), Private Hand dug well (HDW) (12.8%), communal HDW (4.9%), and others. Some households use more than two water source options for their irrigation. That means, the households use water sources for irrigation 79.3% from surface water (River, spring and pond) and 19.7% from groundwater (private and communal hand dug wells and deep wells) to irrigate their land .the same table 3.9.1b also indicated that 148 landholders use river water to irrigated 69.7ha, 109 landholders use spring water to irrigate 53.51ha land, and 57 landholders use dams to irrigate 23.4ha land etc. in the rural areas.

**Table 3.9. 21a: Responses of households (HOUSEHOLDs) on Source of water for irrigation), at regional level**

| S.N | Water source used for irrigation | Region | Urban | Infant towns | Rural |
|---|---|---|---|---|---|
| | | % | % | % | % |
| 1 | Dam | 14.8 | 10.4 | 23.7 | 14 |
| 2 | River | 33.3 | 22.9 | 28.8 | 35.2 |
| 3 | Spring | 26.9 | 22.9 | 22 | 28.1 |
| 4 | Pond | 1.9 | 2.08 | 1.7 | 2 |
| 5 | Private HDW | 13.5 | 16.71 | 15.3 | 12.8 |
| 6 | Communal HDW | 5.6 | 10.4 | 6.8 | 4.9 |
| 7 | Deep well | 2.7 | 10.4 | 1.7 | 2 |
| 8 | Other | 1.2 | 4.2 | | 1 |

Table 3.9.21b: Number of holders and Area of irrigable land by sources of water

| Category | Holder /hectare | Source of water for irrigation | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Dam | River | Spring | Pond | Private HDW | Comm HDW | Deep well | Other | Total |
| **Regional** | **Holders** | **76** | **176** | **133** | **10** | **69** | **30** | **15** | **6** | **515** |
| | **Hectare** | **48.3** | **83.5** | **67.2** | **3.9** | **25.4** | **24** | **9.1** | **2** | **263.3** |
| Urban | Holders | 5 | 11 | 11 | 1 | 8 | 5 | 5 | 2 | 48 |
| | Hectare | 14.2 | 5.6 | 8.8 | 0.2 | 3 | 4.7 | 3. 03 | 0.35 | 39.8 |
| Infant Town | Holders | 14 | 17 | 13 | 1 | 9 | 4 | 2 | | 60 |
| | Hectare | 10.7 | 8.2 | 5 | 0.1 | 3.4 | 3 | 1.3 | | 31.6 |
| Rural | Holders | 57 | 148 | 109 | 8 | 52 | 21 | 8 | 4 | 407 |
| | Hectare | 23.4 | 69.7 | 53.51 | 3.6 | 18.9 | 16.3 | 4.8 | 1.7 | 191.9 |

### 3.9.2.3 Irrigation water sources Preferences of the household

**Region**

As indicated in Table 3.9.22 the main preference of water sources for irrigation include river (28.7), dam (24.6%), spring (21.4%), Private HDW (13.4%) and others.

**Urban**

The sample respondents in the major urban were also asked about preference of the water sources for their irrigation. Table 3.9.22 shows that their preferences include dam (35%), Private HDW (23%), river (13%), spring (13%), and others. The main reasons for their preferences these water sources is that they have relatively enough and reliable amount of water for a longer time and need less energy. Moreover, the hand dugs wells are also simple for their management and avoid social conflict among user.

**Infant towns**

The sample respondents of infant towns were also asked about preference of the water sources for their irrigation. Table 3.9.22 shows that their preferences include river (27.1%), dam (23.7%), spring (20.3%), Private HDW (13.6%), deep well (8.5%) and others.

**Rural**

The sample respondents of the rural areas were also asked about preference of the water sources for their irrigation. Table 3.9.22 shows that, their preferences include river (30.8%), dam

(23.5%), spring (22.5%), Private HDW (12.3%) and others. The main reasons for their preferences these water sources is that they have relatively enough and reliable amount of water for a longer time and need less energy.

**Table 3.9. 22: Responses of households (HOUSEHOLDs) on water sources preferences for irrigating, at regional level**

| S.N | Preferences of water source for irrigation | Regions | Urban | Infant town | Rural |
|---|---|---|---|---|---|
| | | % | % | % | % |
| 1 | Dam | 24.6 | 35 | 23.7 | 23.5 |
| 2 | River | 28.7 | 13 | 27.1 | 30.8 |
| 3 | Spring | 21.4 | 13 | 20.3 | 22.5 |
| 4 | Pond | 1.9 | 4 | 3.4 | 1.4 |
| 5 | Private HDW | 13.4 | 23 | 13.6 | 12.3 |
| 6 | communal HDW | 3.2 | 4 | 3.4 | 3.1 |
| 7 | Deep well | 5.7 | 6 | 8.5 | 5.2 |
| 8 | other | 1.1 | 2 | - | 1.2 |

### 3.9.2.4 Irrigable land size

**Regional**

Surveyed household indicated that 75.6% of the respondents have less than 0.5ha irrigable land size (Table 3.9.23). The average land size of the house hold in the irrigation scheme is 0.46ha at regional level (Table 3.9.24) as per the survey. Although some outlier values are edited during the calculation, still the average regional land holding seems higher because the irrigable land holding of the western, northwestern and south Tigray are higher

**Urban**

66% of the respondents of the urban areas showed that their land size in the irrigation scheme is less than 0.5ha (table 3.9.23). The average land size of the house hold irrigation scheme is 0.4ha at regional level (Table 3.9.24)

**Infant towns**

The survey also revealed that 69.8% of the respondents of the infant towns have less than 0.5ha (table 3.9.23) land size in the irrigation scheme. The average land size of the house hold irrigation scheme is 0.4ha at regional level (Table 3.9.24)

**Rural**

The survey showed most of the household in the rural areas (77.8%) have less than 0.5ha irrigable land sizes (Table 3.9.23). More specifically, 55% of the respondents have ≤0.25ha irrigable land holdings. The average land size of the house hold irrigation scheme is 0.44ha at regional level (Table 3.9.24).

.Table 3.9. 23: Responses of households (HOUSEHOLDs) on size of irrigable land (Ha), at regional level

| S.N | Irrigable land | **Regional** | **Urban** | **Infant towns** | **Rural** |
|---|---|---|---|---|---|
| | | % | % | % | % |
| 1 | <=0.25 | 52.5 | 29 | 54.7 | 55.3 |
| 2 | 0.25-0.5 | 23.1 | 37 | 15.1 | 22.5 |
| 3 | 0.5-1 | 16 | 20 | 22.6 | 14.4 |
| 4 | 1-1.5 | 0.42 | 0 | 0 | 0.53 |
| 5 | 1.5-2 | 4.2 | 8 | 5.7 | 3.5 |
| 6 | >2 | 3.8 | 6 | 1.9 | 3.7 |

**Table 3.9. 24: Respondents of HOUSEHOLDs on size of irrigable area by zone and region**

| Size of Irrigable area (ha) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Regional | | | | Urban | | | | Infant town | | | | Rural | | | |
| Obs. | Mean | Min. | Max. | Obs. | Mean | Min. | Max. | Obs. | Mean | min. | Max. | Obs. | Mean | Min. | Max. |
| 468 | 0.46 | 0.0025 | 4 | 47 | 0.6 | 0.25 | 4 | 51 | 0.4 | 0.001 | 2 | 370 | 0.4.4 | 0.001 | 3 |

### 3.9.2.5 Irrigation technology/methods

**Regional**

Table 3.9.25 gives information about the irrigation technology/methods used by sample respondents. Accordingly, the canal (60.9%) and Tube (25.2%) types of irrigation methods common ones among sample respondents in the study area.

**Urban**

Referring the same table (Table 3.9.25), the Tube (47%) and canal (39%) irrigation methods are regularly used ones in the urban irrigation schemes too.

**Infant towns**

Similar to the major rural areas, the main irrigation methods used in the infant towns are canal (59.3%) and Tube (24.1%) irrigation methods.

**Rural**

As presented in the table 3.9.25, the commonly adopted irrigation methods in the rural areas include canal (63.8%) and Tube (22.7%).

**Table 3.9. 25: Responses of households (HOUSEHOLDs) irrigating technology/method, at regional level**

| S.N | Irrigation technology used | Regional | Urban | Infant towns | Rural |
|---|---|---|---|---|---|
| | | % | % | % | % |
| 1 | Canal | 60.9 | 39 | 59.3 | 63.8 |
| 2 | Tube | 25.2 | 47 | 24.1 | 22.7 |
| 3 | Sprinkler | 3.6 | 2 | 3.7 | 3.7 |
| 4 | Other ( drip , treadle pump, other traditional items) | 10.3 | 12 | 13 | 9.7 |

### 3.9.2.6 Adequacy of sources of irrigation water

**Regional**

The availability of water is key element the irrigation sector to boost production. Accordingly, sustainability of water for irrigation period is surveyed. Table 3.9.26 presents about the adequacy of the water sources for the intended irrigation period. Results reveal that 36.6 % of the respondents at regional level said there is high deficiency of water source for irrigation at middle of the irrigation period.

**Urban**

Respondents were asked about the adequacy of the water sources for the intended irrigation period in the urban areas. The outcome of survey shown in Table 3.9.26 display that 34.1 % of the respondents said there is high deficiency of water source for irrigation at middle of the irrigation period .

**Infant towns**

Similarly the sustainability of irrigation water in the infant towns is also assessed. Hence, data presented in table 3.9.26 depicted that 30.6 % of the respondents said there is high deficiency of water source for irrigation at middle of the irrigation period in the infant towns.

**Rural**

The survey provided in table 3.9.26 confirmed that 37.7 % of the respondents said there is high deficiency of water source for irrigation at the middle of the irrigation period.

**Table 3.9. 26: Responses of households (HOUSEHOLDs) on water source adequacy (sustainability) though out the year for irrigation, by Region**

| S.N | Responses of households (HOUSEHOLDs) | Regional | Urban | Infant towns | Rural |
|---|---|---|---|---|---|
| | | % | % | % | % |
| 1 | No | 36.6 | 34.1 | 30.6 | 37.7 |
| 2 | Yes | 63.4 | 65.9 | 69.4 | 62.3 |

### 3.9.2.7 The involvement and participation of women in the irrigation sector is also assessed

**Regional**

The sample respondents were asked about the participation of women and equitable distribution of irrigation water in the irrigation schemes. As provided in Table 3.9.27, overall about 29.5% of the sample respondents at regional level confirmed that there is no involvement of women and no delivery of a fair share of water to users throughout a system.

**Urban**

The sample respondents in the urban were also asked about the participation of women and equitable distribution of irrigation water in the irrigation schemes (Table 3.9.27). the analysis indicated that overall about 25% of the sample respondents at the urban confirmed that there is no involvement of women and no delivery of a fair share of water to users throughout a system. Whereas 75% were of the view that women are involved irrigation activities and water was equitably distributed.

**Infant towns**

Similarly, the participation of women and irrigation water distribution is assessed for the infant towns. Data presented in Table 3.9.27 indicate that 26.9% of the sample respondents confirmed that there is no involvement of women and no delivery of a fair share of water to users throughout a system..

**Rural**

The sample respondents were asked about the participation of women and equitable distribution of water in the irrigation schemes. Data presented in Table 3.9.27 indicate that overall 30% of

the sample respondents at the rural areas confirmed that there is no delivery of a fair share of water to users throughout a system. Whereas 70% were of the view that women are involved irrigation activities and water was equitably distributed.

**Table 3.9. 27: Response of Households on participation of women in irrigation activities**

| S.N | Responses of households (HOUSEHOLDs) | **Regional** | **Urban** | **Infant town** | **Rural** |
|---|---|---|---|---|---|
| | | % | % | % | % |
| 1 | No | 29.5 | 25 | 26.9 | 30.4 |
| 2 | Yes | 70.5 | 75 | 73.1 | 69.6 |

### 3.9.2.8 Availability of water users association (WUA) and women participation

**Regional**

As indicated in the Table 3.9.28, 73.9 % of the respondents showed that the households involved in the irrigation projects do not have water users association (WUA) while the rest 26.1 % responded that they have WUA. This would sure have significant impact on the mismanagement of the irrigation water resources and may also raise some conflicts among the water users.

**Urban**

64.4 % of the respondents of the irrigation projects in urban areas showed that the households involved in the irrigation projects do not have water users association (WUA) while the rest 35.6 % responded that they have WUA. The study also tried to assess the participation of women in the WUA because such representation of women (one of the vulnerable groups) has important implications for equity. Members of The WUA vary from a minimum of 1 to 300 people, averaging to about 44.9 members.

**Infant towns**

78.8.4 % of the respondents of the infant towns showed that the households involved in the irrigation projects do not have water users association (WUA) while the rest 35.6 % responded that they have WUA. The study also tried to assess the participation of women in the WUA because involvement of such vulnerable group in the society is mandatory.

**Rural**

As indicated in the Table 3.9.28, 74.4 % of the respondents showed that the households involved in the irrigation projects do not have water users association (WUA) while the rest 25.6 % responded that they have WUA. The study also tried to see the involvement of women in the WUA. Members of the WUA vary from a minimum of 1 to 600 people, averaging to about 68.9 members as provided in Table 3.9.29. Out of the irrigation schemes with WUA, only 44.1% of WUA has women members within them while the rest 55.9% of the WUA do not involve women.

**Table 3.9. 28: Responses of households (HOUSEHOLDs) on water users association (WUA), by region**

| S.N | Do you have WUA? | Regional | Urban | Infant town | Rural |
|---|---|---|---|---|---|
| | | % | % | % | % |
| 1 | No | 73.9 | 64.4 | 78.8 | 74.4 |
| 2 | Yes | 26.1 | 35.6 | 21.2 | 25.6 |

**Table 3.9. 29: Responses of households (HOUSEHOLDs) on members of WUA, by region**

| S.N | WUA | Average members of WUA in the irrigation Project | | | |
|---|---|---|---|---|---|
| | | **Region** | **Urban** | **Infant towns** | **Rural** |
| 1 | Obs. | 150 | 19 | 14 | 117 |
| 2 | mean | 64.1 | 44.9 | 50.4 | 68.9 |

**3.9.2.9 Main challenges of the irrigation scheme**

**Regional**

Data presented in Table 3.9.30 reveal that the major regional problems seen in the household irrigation consists of Shortage of water (26.8%), Social conflict (20.2), lack of market (19.4%), Operation and maintenance (17.2%), and Fertility problems (12.6%).

**Urban**

As one can be seen from table 3.9.30 the major problems in the irrigation schemes of the household in urban areas includes shortage of water (38.6%), lack of market (17%), fertility problem (14%), operation and maintenance (13%), social conflict (13%) and the likes,

**Infant towns**

Analysed results in table 3.9.30 displayed that the major problems in the irrigation schemes of the household of infant towns are shortage of water (24.4.6%), social conflict (19.9%), operation and maintenance (18.6%), fertility problem (17.3%), lack of market (15.4%), and the likes,

**Rural**

Analysed results of the rural areas (table 3.9.30) confirmed that the major problems in the irrigation schemes of the household includes shortage of water (26.4%), social conflict (20.7%), lack of market (20.1%), %), operation and maintenance (17.3%), fertility problem (11.8) and the likes,

**Table 3.9. 30: Responses of households (HOUSEHOLDs) on problems facing the irrigation schemes, at regional level**

| S.N | Problems facing the irrigation schemes | **Region** | **Urban** | infant towns | Rural |
|---|---|---|---|---|---|
| | | % | % | % | % |
| 1 | Shortage of water | 26.8 | 38.6 | 24.4 | 26.4 |
| 2 | Operation and maintenance | 17.2 | 13 | 18.6 | 17.3 |
| 3 | Social conflict | 20.2 | 13 | 19.9 | 20.7 |
| 4 | lack of Transport (market) | 19.4 | 17 | 15.4 | 20.1 |
| 5 | Salinity buildups/sodicity problems | 3.8 | 4 | 4.5 | 3.7 |
| 6 | Fertility problems | 12.6 | 14 | 17.3 | 11.8 |

## 3.10. Health

### 3.10.1. Maternal and child health

The survey included 12,316 randomly selected households from rural, urban and infant towns in the region. From the total households surveyed, 9033 households had females in the reproductive age category. Five hundred eighty two (5.39%) were pregnant and 42 (7.5%) of the reported pregnancies were unwanted (Table, 3.10.2-3.10.5).

**Table 3.10. 1:** Distribution of female reproductive age in Tigray

| | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| Age category | % | % | % | % |
| 15-19 | 2.54 | 0.98 | 3.36 | 6.88 |
| 20-24 | 5.28 | 11.25 | 5.33 | 21.86 |
| 25-29 | 9.48 | 21.59 | 11.9 | 42.97 |
| 30-34 | 15.14 | 19.52 | 17.08 | 51.74 |
| 35-39 | 17.98 | 19.73 | 19.85 | 57.56 |
| 40-44 | 23.93 | 14.76 | 22.04 | 60.73 |
| 45-49 | 25.65 | 12.16 | 20.44 | 58.25 |
| Total | 100 | 100 | 100 | 100 |

**Table 3.10. 2:** Pregnancy status of mothers in the reproductive age

| | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| Pregnancy status | % | % | % | % |
| Yes | 4.75 | 6.29 | 4.51 | 5.39 |
| No | 95.25 | 93.71 | 95.49 | 94.61 |
| Total | 100 | 100 | 100 | 100 |

**Table 3.10. 3:** Status of wanted pregnancy

| | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| Wanted pregnancy | % | % | % | % |
| yes | 92.53 | 91.48 | 94.74 | 92.5 |
| later | 1.62 | 0.57 | 2.63 | 1.43 |
| No | 5.84 | 7.95 | 2.63 | 6.07 |
| Total | 100 | 100 | 100 | 100 |

**Table 3.10. 4:** Mothers interest about their last child

| | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| Was last child based on your interest | % | % | % | % |
| Yes | 95.48 | 94.84 | 91.74 | 94.72 |
| Later | 1.10 | 2.56 | 1.46 | 1.70 |
| No | 3.42 | 2.59 | 6.8 | 3.58 |
| Total | 100 | 100 | 100 | 100 |

**Family planning**

In response to the questions about their knowledge to family planning, their practice and reasons for use, (71.47%) reported they have knowledge, (80.09%) ever used family planning and the majority (65.61%) of mothers responded they use Depo-Provera. Child spacing or making gap was the main reason why mothers use family planning methods accounting (85.86%) in the region (Table 3.10.6-3.10.9).

**Table 3.10. 5:** Distribution of reproductive age mothers by their family planning knowledge

| | Rural | | Urban | | Infant | | Regional | |
|---|---|---|---|---|---|---|---|---|
| Knowledge to FP | Wgt% | % | Wgt % | % | Wgt % | % | No | % |
| Yes | 52.89 | 64.01 | 74.29 | 83.02 | 64.79 | 74.56 | 6366 | 71.47 |
| No | 47.11 | 35.99 | 25.71 | 16.98 | 35.21 | 25.44 | 2541 | 28.53 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 8907 | 100 |

**Table 3.10. 6:** Practice of family planning use by mothers in the reproductive age

| | Rural | | Urban | | Infant towns | | Regional | |
|---|---|---|---|---|---|---|---|---|
| Ever used FP | Wgh% | % | Wgt % | % | Wgt % | % | No | % |
| Yes | 75.96 | 78.1 | 78.09 | 81.64 | 81.02 | 53.24 | 5084 | 80.09 |
| No | 24.04 | 21.9 | 21.91 | 18.36 | 18.98 | 17.35 | 1264 | 19.91 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 6348 | 100 |

**Table 3.10. 7:** Distribution of ever used family methods among reproductive age mothers

| | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| Type of FP ever used | % | % | % | % |
| Abstinence | 1.46 | 1.59 | 0.95 | 1.44 |
| Calendar | 0.5 | 1.51 | 0.95 | 1.00 |
| Condom | 1.21 | 1.84 | 0.12 | 1.32 |
| Pills | 12.39 | 15.98 | 15.3 | 14.36 |
| Loop | 0.58 | 4.94 | 1.19 | 2.55 |
| In plant | 11.47 | 14.34 | 15.54 | 13.31 |
| Depo Provera | 72.1 | 59.22 | 65.72 | 65.61 |
| Others | 0.25 | 0.57 | 0.24 | 0.39 |
| Total | 100 | 100 | 100 | 100 |

**Table 3.10. 8:** Reasons for Family planning use

| Why FP | Rural | | Urban | | Infant | | Regional | |
|---|---|---|---|---|---|---|---|---|
| | Wgt % | % | Wgt % | % | Wgt % | % | No | % |
| To prevent pregnancy | 12.71 | 11.79 | 17.36 | 17.59 | 13.16 | 13.40 | 716 | 14.14 |
| To make gap | 87.29 | 88.21 | 82.64 | 82.41 | 86.84 | 86.6 | 4346 | 85.86 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 5062 | 100 |

**Birth history and child health**

Mothers were also interviewed about their birth history and child health, (13.6%) of them were Primi-gravida (1 history of pregnancy), (64.23%) multigravida. While, (22.17%) of women had history of live birth with (Multi para). One thousand and five (55.52%) of the households had at least one history of death of children (Table 3.10.10-3.10.11)

**Table 3.10. 9:** Distribution of live children by HOUSEHOLD, Tigray region, Ethiopia

| No live children per HOUSEHOLDs | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| | % | % | % | % |
| 1 | 9.97 | 19.33 | 14.76 | 13.60 |
| 2 | 14.07 | 23.37 | 17.97 | 17.56 |
| 3 | 15.53 | 20.14 | 17.39 | 17.25 |
| 4 | 15.94 | 15.82 | 17.52 | 16.12 |
| 5 | 14.3 | 10.61 | 15.53 | 13.30 |
| 6 | 13.54 | 5.63 | 8.47 | 10.33 |
| 7 | 8.98 | 3.54 | 4.56 | 6.65 |
| 8 | 4.85 | 1.5 | 2.18 | 3.42 |
| 9 | 2.16 | 0.06 | 1.03 | 1.33 |
| 10 | 0.5 | | 0.26 | 0.31 |
| 11 | 0.13 | | 0.32 | 0.11 |
| 12 | 0.02 | | | 0.01 |
| Total | 100 | 100 | 100 | 100 |

**Table 3.10. 10:** Distribution of child death by HOUSEHOLDs

| Number of children death per HOUSEHOLDs | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| | % | % | % | % |
| 1 | 54.55 | 60.47 | 50 | 55.52 |
| 2 | 21.52 | 20.51 | 23.42 | 21.49 |
| 3 | 11.16 | 12.18 | 11.26 | 11.44 |
| 4 | 5 | 4.49 | 5.86 | 4.97 |
| 5 | 3.39 | 1.5 | 3.6 | 2.93 |
| 6 | 2.68 | 0.43 | 3.6 | 2.21 |
| 7 | 0.71 | 0.43 | 0.45 | 0.61 |
| 8 | 0.8 | | 0.9 | 0.61 |
| 9 | 0.09 | | 0.45 | 0.11 |
| 10 | 0.09 | | 0.45 | 0.11 |
| 12 | -- | | | |
| Total | 100 | 100 | 100 | 100 |

Total fertility rate (TFR) in simple terms refers to total number of children born or likely to be born to a woman in her life time if she were subject to the prevailing rate of age-specific fertility in the population. Total fertility in urban Tigray is around the replacement level according to the united nations population division definition with a rate of 2.3, reproductive age mothers from rural and infant towns have more than replacement level 4.81 and 4.7 respectively. In this survey the average number of children women would bear if current fertility rates remained unchanged during their reproductive lifespans (15-49 years of age) in Tigray is 3.94.

Unlike the report in Ethiopia which is 68/1000 live births in 2012, under five mortality in Tigray region is 66.57/1000.

**Table 3.10. 11: Showing TFR and ASDR in Tigray**

| TFR and ASDR | Rural | Urban | Infant town | Regional |
|---|---|---|---|---|
| Total fertility | 4.84 | 2.3 | 4.7 | 3.94 |
| Under five mortality rate | | | | 66.57/1000 |

**Antenatal care**

About (74.52%) mothers had at least one time advice about pregnancy check-up from health professionals, while significant numbers are still getting advice from family and traditional birth

attendants. Two thousand two hundred twenty four (25.48%) of them did not visit health facility for checkup during their pregnancy period. Among the reproductive age group, (8.39%) of them were pregnant currently, (84.88%) of them started ANC, while (15.12%) did not. Besides, majority (38.97%) of the mothers who had ANC checkup in their last pregnancy before the survey visited health facility for ANC care at their gestational age of 7 and above months (Tables 3.10.13-3.10.20).

**Table 3.10. 12:** ANC follow-ups in the last pregnancy (at least one)

| | Rural | | Urban | | Infant town | | Regional | |
|---|---|---|---|---|---|---|---|---|
| ANC follow up | Wgt % | % | Wgt % | % | Wgt % | % | No | % |
| Yes | 56.27 | 68.84 | 74.86 | 83.66 | 66.13 | 76.29 | 6504 | 74.52 |
| No | 43.73 | 31.16 | 25.14 | 16.19 | 33.87 | 23.71 | 2224 | 25.48 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 8728 | 100 |

**Table 3.10. 13:** Distribution of mothers by pregnancy

| | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| Pregnancy status | % | % | % | % |
| Yes | 6.21 | 13.05 | 5.34 | 8.39 |
| No | 93.79 | 86.95 | 94.66 | 93.54 |
| Total | 100 | 100 | 100 | 100 |

**Table 3.10. 14:** Distribution of current pregnant mothers by ANC follow-up (at least once)

| ANC follow-up | | Rural | | Urban | | Infant | Regional |
|---|---|---|---|---|---|---|---|
| | wgt % | % | wgt% | % | wgt% | % | % |
| Yes | 56.27 | 82.35 | 74.86 | 87 | 66.13 | 89.47 | 84.88 |
| No | 43.73 | 17.65 | 25.14 | 13 | 33.87 | 10.53 | 15.12 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

**Table 3.10. 15:** Gestational age of ANC follow up started during the last pregnancy

| Gestational age ANC started (month) | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| | % | % | % | % |
| 1 | 3.47 | 6.03 | 2.67 | 4.27 |
| 2 | 2.43 | 5.53 | 5.33 | 3.91 |
| 3 | 11.11 | 9.55 | 6.67 | 9.96 |
| 4 | 12.15 | 9.05 | 16 | 11.57 |
| 5 | 17.36 | 14.57 | 18.67 | 16.55 |
| 6 | 17.36 | 11.56 | 13.33 | 14.77 |
| 7 | 12.5 | 16.58 | 12 | 13.88 |
| 8 | 18.40 | 16.58 | 13.33 | 17.08 |
| 9 | 5.21 | 10.55 | 12 | 8.01 |
| Total | 100 | 100 | 100 | 100 |

The proportion of mothers in Tigray who received antenatal care (ANC) from a skilled provider is 82.52% currently, (62% in Ethiopia, EDHS 2016).

**Table 3.10. 16:** Distribution of ANC follows up skilled and unskilled personals (current pregnant mothers)

| | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| Who followed you | % | % | % | % |
| Health professionals | 75 | 91.79 | 83.82 | 82.52 |
| HEWs | 21.43 | 7.18 | 14.71 | 15.15 |
| TTBA | 2.38 | 1.03 | 1.47 | 1.75 |
| TBA | 0 | | | |
| Family, friend or neighbors | 0.79 | | | 0.39 |
| No one | 0.39 | | | 0.19 |
| Others | 0 | | | |
| Total | 100 | 100 | 100 | 100 |

**Table 3.10. 17:** Distribution of ANC follows up by skilled and unskilled personals (last pregnant mothers)

| Who followed you | Rural | | Urban | | Infant towns | | Regional | |
|---|---|---|---|---|---|---|---|---|
| | Wgt % | % | Wgt % | % | Wgt % | % | No | % |
| Skilled | 79.75 | 80.74 | 92.06 | 91.38 | 85.63 | 85.94 | 6053 | 85.68 |
| Unskilled | 20.25 | 19.26 | 7.94 | 8.62 | 14.37 | 14.06 | 1012 | 14.32 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 7065 | 100 |

**Table 3.10. 18: D**istribution of ANC follow-up by place, Tigray

| Place of ANC | Rural | Urban | Infant | Regional | |
|---|---|---|---|---|---|
| | % | % | % | No | % |
| My house | 1.75 | 4.78 | 1.38 | 204 | 2.89 |
| Public hospital | 14.58 | 47.63 | 24.19 | 2048 | 28.98 |
| Public health centers | 69.46 | 39.73 | 69.81 | 4084 | 57.8 |
| Health posts | 13.48 | 1.98 | 3.83 | 534 | 7.56 |
| Private hospital, clinics | 0.74 | 5.89 | 0.79 | 196 | 2.77 |
| Total | 100 | 100 | 100 | 7066 | 100 |

Two hundred forty nine (48.44%) of women had at least four ANC visits during their last pregnancy, and a significant proportion of mothers are attending less than the required follow up expected.

**Table 3.10. 19:** Frequency of ANC follows up

| Frequency of ANC follow up | Rural | | Urban | | Infant towns | | Regional | |
|---|---|---|---|---|---|---|---|---|
| | Wgt % | % | Wgt % | % | Wgt % | % | No | % |
| Once | 3.34 | 3.35 | 2.24 | 2.35 | 2.70 | 2.51 | 60 | 11.67 |
| Twice | 11.41 | 11.62 | 6.69 | 6.68 | 9.47 | 9.12 | 81 | 15.76 |
| Three times | 27.87 | 27.51 | 16.19 | 16.21 | 21.63 | 22.16 | 124 | 24.12 |
| >=4 times | 57.38 | 42.48 | 74.88 | 74.76 | 66.2 | 66.21 | 249 | 48.44 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 514 | 100 |

A significant number of mothers are still giving birth with the help of unskilled practitioner's in Tigray accounting (47.25%). Of the total mothers with delivery history, only (52.75 %) of them were helped by skilled health care providers including health extension workers and trained traditional birth attendants.

**Place of delivery**

Findings of the survey indicated, about (32.18%) of mothers are still delivering at home without the help of skilled personnel's and facilities in Tigray. This is lower than the EDHS 2016 report which is 57% in Tigray.

**Table 3.10. 20:** Distribution by Place of delivery

| Place of delivery | Rural | | Urban | | Infant towns | | Regional | |
|---|---|---|---|---|---|---|---|---|
| | Wgt % | % | Wgt % | % | Wgt % | % | No | % |
| Home delivery | 52.33 | 52.04 | 26.31 | 17.51 | 37.23 | 41.25 | 2741 | 32.18 |
| Institutional delivery | 47.67 | 47.96 | 73.69 | 82.49 | 62.77 | 58.75 | 2313 | 67.82 |
| Total | 100 | 100 | 2518 | 100 | 100 | 100 | 8518 | 100 |

**Table 3.10. 21:** Distribution of delivery by skill and unskilled practitioners

| Who helped you during delivery | Rural | | Urban | | Infant towns | | Regional | |
|---|---|---|---|---|---|---|---|---|
| | Wgt % | % | Wgt % | % | Wgt % | % | No | % |
| Skilled | 39.93 | 49.67 | 71.12 | 79.47 | 53.81 | 62.09 | 5153 | 60.35 |
| Unskilled | 60.07 | 50.33 | 28.88 | 20.53 | 46.19 | 37.91 | 3386 | 39.65 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 8539 | 100 |

**Table 3.10. 22:** Distribution of wanted delivery among household

| Was last delivery wanted | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| | % | % | % | % |
| Yes | 91.48 | 94.62 | 85.92 | 92.98 |
| Later | 1.96 | 2.67 | 1.7 | 2.40 |
| No | 6.56 | 2.71 | 12.38 | 4.62 |
| Total | 100 | 100 | 100 | 100 |

**Postnatal care**

Women who had a postnatal check after giving birth in their last child were only (54.15%). almost equal numbers of mothers are not attending postnatal care after delivery (45.85%). Among the mothers who had the service (27.34%) of them attended >= 4 times for postnatal care. Besides (10.84%) of them were helped by unskilled personals.

**Table 3.10. 23:** PNC follow up (at least once in the last delivery)

| PNC after delivered | Rural | | Urban | | Infant | | Regional |
|---|---|---|---|---|---|---|---|
| | Wgt% | % | Wgt % | % | Wgt% | % | % |
| Yes | 40.83 | 48.48 | 54.76 | 64.15 | 49.33 | 55.47 | 54.15 |
| No | 59.17 | 51.52 | 42.24 | 35.85 | 50.67 | 44.53 | 45.85 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

**Table 3.10. 24:** Number of PNC follow-ups

| | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| Number of PNC | % | % | % | % |
| Once | 24.46 | 22.68 | 21.67 | 23.39 |
| Twice | 24.86 | 26.33 | 27.08 | 25.73 |
| Three times | 23.79 | 22.55 | 25 | 23.54 |
| >= 4 times | 26.9 | 28.44 | 26.25 | 27.34 |
| Total | 100 | 100 | 100 | 100 |

**Table 3.10. 25: Distribution of PNC by skilled and unskilled practitioners**

| | Rural | | Urban | | Infant | | Regional |
|---|---|---|---|---|---|---|---|
| Who followed you PNC | Wgt % | % | Wgt % | % | Wgt % | % | % |
| Skilled | 66.40 | 69.38 | 85.96 | 86.6 | 76.15 | 78.18 | 76.77 |
| Unskilled | 33.6 | 30.62 | 14.04 | 13.4 | 23.85 | 21.82 | 23.23 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

**Table 3.10. 26:** Distribution of PNC follow-up by Place

| | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| Place of PNC follow-up | % | % | % | % |
| My house | 14.13 | 9.94 | 9.14 | 11.88 |
| Public hospitals | 15.99 | 51.06 | 25.06 | 29.7 |
| Public health centers | 58.57 | 33.85 | 62.19 | 50.48 |
| Public health posts | 10.25 | 1.68 | 2.77 | 6.07 |
| Private hospitals and clinics | 1.06 | 3.48 | 0.83 | 1.87 |
| Total | 100 | 100 | 100 | 100 |

**Breast feeding practices of mothers to their new born**

About (95.62%) of the mothers practice breast feeding and (80.2%) of them initiated breast feeding within 30 minutes. But (4.38%) of them never practice breast feeding. Moreover,(15.55%) of mothers practice colostrum discharge while, one thousand one hundred ninety three (80.44%) stopped breast feeding within 1-2 years and (15.52%) of the mothers are not providing supplementary food at the age of six months (Table 3.10.28-3.10.32).

**Table 3.10. 27:** Distribution of mother's breast feeding practice

| | Rural | Urban | Infant | Region |
|---|---|---|---|---|
| Breast feeding practice | % | % | % | % |
| Yes | 94.98 | 97.07 | 95.34 | 95.62 |
| No | 5.02 | 2.93 | 4.66 | 4.38 |
| Total | 100 | 100 | 100 | 100 |

**Table 3.10. 28:** Distribution of breast feeding initiation

| | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| **Time b**reast **feeding started** | % | % | % | % |
| Within 30 minutes | 77.8 | 83.15 | 83.58 | 80.2 |
| Within 1hour | 15.72 | 10.36 | 11.98 | 13.64 |
| Within 1day | 4.45 | 3.2 | 2.81 | 3.84 |
| After 1 day | 2.04 | 3.29 | 1.63 | 2.32 |
| Total | 100 | 100 | 100 | 100 |

**Table 3.10. 29:** Distribution of Colostrum discharge practice by mothers

| **Colostrum discharge** | Rural | | Urban | | Infant | | Regional |
|---|---|---|---|---|---|---|---|
| | Wgt % | % | Wgt % | % | Wgt % | % | % |
| Yes | 25.10 | 4.47 | 34.83 | 34.21 | 21.38 | 21.53 | 15.55 |
| No | 74.90 | 74.56 | 65.17 | 65.79 | 78.62 | 78.47 | 72.69 |
| Total | 100 | 100 | | 100 | 100 | 100 | 100 |

**Table 3.10. 30:** Range of time mothers stopped breastfeeding their child

| **Time** breast **feeding stopped** | Rural % | Urban % | Infant % | Regional % |
|---|---|---|---|---|
| <=6 months | 0 | 0 | 0 | 0 |
| 1 -2years | 90.62 | 87.1 | 75.57 | 80.44 |
| 2- 3 years | 7.08 | 10.10 | 19.89 | 10.11 |
| I dont know | 2.3 | 2.83 | 4.55 | 2.83 |
| Total | 100 | 100 | 100 | 100 |

**Table 3.10. 31:** Provision of additional food to children aged 6 month

| **Additional food** | Rural | | Urban | | Infant | | Regional |
|---|---|---|---|---|---|---|---|
| | Wgt% | % | Wgt% | % | Wgt% | % | % |
| Yes | 70.15 | 69.05 | 91.53 | 91.3 | 61.72 | 58.82 | 84.48 |
| No | 29.85 | 30.95 | 8.47 | 8.7 | 38.28 | 41.18 | 15.52 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

**Availability of vaccination cards among HOUSEHOLDs**

Majority of the households do not have vaccination cards (76.18%), only few of them (23.82 %) had vaccination cards at hand. However EDHS 2016 report indicated at the regional level, coverage of all basic vaccinations is among the highest in Tigray (67%).

**Table 3.10. 32:** Availability of HOUSEHOLDs vaccination cards

| **Vaccination card** | Rural | | Urban | | Infant towns | | Regions |
|---|---|---|---|---|---|---|---|
| | Wgt % | % | Wgt % | % | Wgt % | % | % |
| Yes | 20.43 | 23.59 | 21 | 21.48 | 28.87 | 31.84 | 23.82 |
| No | 79.57 | 76.41 | 79 | 78.52 | 71.13 | 68.16 | 76.18 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

Overall, 508(5.17%) of the households reported disability

**Table 3.10.34Vaccination status of HOUSEHOLDs in Tigray**

| Vaccination status | Wgt (%) Urban | Wgt (%) Rural | Wgt (%) Infant | Wgt (%) Regional |
|---|---|---|---|---|
| Completed vaccination | 38.18 | 31.27 | 43.83 | 35.19 |
| Started but not completed | 3.76 | 4.12 | 4.00 | 3.98 |
| Not vaccinated | 44.97 | 52.49 | 39.42 | 48.30 |
| I don't know | 13.08 | 12.12 | 12.74 | 12.51 |
| Total | 100 | 100 | 1000 | 100 |

**Table 3.10.35:** Distribution of disability by households

| **Disability** | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| | % | % | % | % |
| Yes | 2.09 | 9.46 | 2.25 | 5.17 |
| No | 97.91 | 90.54 | 97.75 | 94.83 |
| Total | 100 | 100 | 100 | 100 |

Health insurance coverage was found low; accounting only (32.47%), majority (67.53%) is not covered by any type of health insurance. Lack of awareness was mentioned as the main reason accounting (60.35 %) followed by no money to pay (21.58%).

**Community based health insurance**

**Table 3.10. 33:** Community based health insurance usage

| | Rural | | Urban | | Infant towns | | Regional |
|---|---|---|---|---|---|---|---|
| **CBHI users** | Wgt % | % | Wgt % | % | Wgt % | % | % |
| Yes | 44.72 | 45.32 | 6.20 | 9.49 | 45.53 | 46.11 | 32.47 |
| No | 55.28 | 54.68 | 93.80 | 93.51 | 54.47 | 53.89 | 67.53 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

**Table 3.10. 34:** Reasons for not using community based health insurance

| Reasons for not using CBHI | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| | % | % | % | % |
| Luck of awareness/the service is not available | 53.96 | 61.69 | 46.22 | 60.35 |
| No money to pay | 31.42 | 10.51 | 28.78 | 21.58 |
| The service is not dependable | 8.39 | 6.1 | 14.00 | 7.97 |
| Others | 6.23 | 13.5 | 11.00 | 10.08 |
| Total | 100 | 100 | 100 | 100 |

**Harmful traditional practice**

Overall, the knowledge of HOUSEHOLDs about harmful traditional practices is low accounting only (47.86%). Though national reports indicated harmful traditional practices are among the lowest in Tigary, still there around (5.56%) circumcision practices in the region. More than 95 % of the circumcisions conducted in the region were practiced by traditional circumcisers.Only

few of the HOUSEHOLDs interviewed had knowledge of fistula accounting (36.72%). One hundred thirty three (3.14%) cases were reported in the survey.

**Table 3.10. 35:** Knowledge and practices of harmful traditional practices by HOUSEHOLDs

| HT practice | Rural | | Urban | | Infant | | Regional |
|---|---|---|---|---|---|---|---|
| | Wgt % | % | Wgt % | % | Wgt % | % | % |
| Yes | 51.87 | 52 | 39.11 | 38.82 | 54.96 | 53.95 | 47.86 |
| No | 48.13 | 48 | 60.89 | 61.18 | 45.04 | 46.05 | 52.14 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

**Table 3.10. 36:** Distribution of circumcision among $U_5$ female children

| Practice of Circumcision | Rural | | Urban | | Infant | | Regional |
|---|---|---|---|---|---|---|---|
| | Wgt% | % | Wgt % | % | Wgt % | % | % |
| Yes | 6.30 | 6.37 | 4.47 | 4.78 | 3.55 | 3.75 | 5.46 |
| No | 93.70 | 93.63 | 95.53 | 95.22 | 96.45 | 96.25 | 94.54 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

**Table 3.10. 37:** Distribution of Circumcision by practitioners

| Who practice it | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| Total 100 | 100 | 100 | 100 | 97 | 100 | 100 |
| | % | % | % | % |
| Traditional circumciser | 96.68 | 94.23 | 91.18 | 95.92 |
| TBA | 0.95 | --- | 2.94 | --- |
| Health professional | 0.47 | --- | 2.94 | --- |
| I don't know | 1.9 | --- | 2.94 | --- |
| Total | 100 | 100 | 100 | 100 |

Table 3.10.39. Distribution of ovula cutting among under five children in Tigray

| | Rural | | Urban | | **Infant** | | **Regional** |
|---|---|---|---|---|---|---|---|
| **Uvula cutting** | Wgt% | % | Wgt% | % | Wgt% | % | % |
| Yes | 86.28 | 85.93 | 58.46 | 56.68 | 86.22 | 86.11 | 80.75 |
| No | 13.72 | 14.07 | 41.54 | 43.32 | 13.78 | 13.89 | 19.25 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Table 3.10. 38:** Distribution of rape in Tigray

| | Rural | | Urban | | Infant | | Regional |
|---|---|---|---|---|---|---|---|
| Rape | Wgt% | % | Wgt% | % | Wgt% | % | % |
| Yes | 19.08 | 18.98 | 32.02 | 33.55 | 23.71 | 22.57 | 24.55 |
| No | 80.92 | 81.02 | 67.98 | 66.45 | 76.29 | 77.43 | 75.45 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

**Table 3.10. 39:** Distribution of disease/injury in the last four months before the survey

| Disease/ injury in the last four months | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| | % | % | % | % |
| Disease | 4.29 | 7.78 | 5.87 | 5.63 |
| Injury | 0.29 | 0.29 | 0.47 | 0.32 |
| No | 95.42 | 91.93 | 93.66 | 94.05 |
| Total | 100 | 100 | 100 | 100 |

**Table 3.10. 40:** Knowledge of households towards Fistula

| | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| Heard about fistula | % | % | % | % |
| Yes | 22.82 | 60.29 | 32.86 | 36.72 |
| No | 77.18 | 39.71 | 67.14 | 63.28 |
| Total | 100 | 100 | 100 | 100 |

**Table 3.10. 41:** Distribution of fistula cases among HOUSEHOLDs

| Have Fistula | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| | % | % | % | % |
| Yes | 1.99 | 4.37 | 1.27 | 3.14 |
| No | 98.01 | 95.63 | 98.73 | 96.86 |
| Total | 100 | 100 | 100 | 100 |

Among the HOUSEHOLDs surveyed regionally, (65.92%) had knowledge of health extension workers in their area. While, a significant number (34.08%) of them had no knowledge about health extension workers still. Of the total HOUSEHOLDs with knowledge, (88.24%) of them witnessed that they received visit by HEWs. Moreover, (39.31%) of them reported they had recent visit by HEWs in the last one month. Besides (79.19%) of the HOUSEHOLDs had trust to the services given by health extension workers.

**Health extension and women development army**

**Table 3.10. 42:** Distribution of households by knowledge to HEWs

| | Rural | | Urban | | Infant | | Regional |
|---|---|---|---|---|---|---|---|
| Knew HEWs | Wgt % | % | Wgt % | % | Wgt% | % | % |
| Yes | 79.06 | 78.76 | 56.57 | 56.56 | 20.94 | 21.24 | 65.92 |
| No | 20.94 | 21.24 | 43.43 | 43.44 | 79.06 | 78.76 | 34.08 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

**Table 3.10. 43:** Distribution of households by HEWs visit

| Did they visit your house | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| | % | % | % | % |
| Yes | 86..95 | 91.24 | 87.44 | 88.24 |
| No | 13.05 | 8.76 | 12.56 | 11.76 |
| Total | 100 | 100 | 100 | 100 |

**Table 3.10. 44:** Distribution of households by HEWs last visit

| | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| Last visit by HEWs | % | % | % | % |
| Last month | 33.75 | 54.28 | 33.11 | 39.31 |
| In the last two to three months | 28.46 | 27.07 | 30.80 | 28.44 |
| More than three months | 37.78 | 18.65 | 36.10 | 32.26 |
| Total | 100 | 100 | 100 | 100 |

**Table 3.10. 45:** Distribution of Households by the Trust given to the services by HEWs

| Trust to the services given by HEWs | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| | % | % | % | % |
| Always | 78.68 | 79.34 | 80.79 | 79.19 |
| Some times | 17.67 | 16.09 | 15.52 | 16.9 |
| Never | 3.65 | 4.57 | 3.69 | 3.91 |
| Total | 100 | 100 | 100 | 100 |

Among the HOUSEHOLDs surveyed regionally, (40.57%) had knowledge of women development army in their area. While, a significant number (59.43%) of them had no knowledge about women development army still. Of the HOUSEHOLDs with knowledge, (89.86%) of them witnessed that they received visit by WDAs.

**Table 3.10. 46:** Distribution of households by knowledge to women development army

| Know WDAs | Rural | | Urban | | Infant towns | | Regional |
|---|---|---|---|---|---|---|---|
| | Wgt % | % | Wgt % | % | Wgt % | % | % |
| Yes | 79.89 | 78.95 | 36.17 | 37.23 | 20.11 | 21.05 | 40.57 |
| No | 20.11 | 21.05 | 63.83 | 62.77 | 79.89 | 78.95 | 59.43 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

**Table 3.10. 47:** Distribution of households by women development army visit

| Did they visit your house | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| | % | % | % | % |
| Yes | 88.49 | 93.39 | 87.69 | 89.86 |
| No | 11.51 | 6.61 | 12.31 | 10.14 |
| Total | 100 | 100 | 100 | 100 |

**Table 3.10. 48:** Distribution of households by health development army recent visit

| Last visit by WDAs | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| | % | % | % | % |
| Last month | 38.13 | 54.19 | 39.91 | 43.22 |
| In the last two to three months | 28.43 | 26.96 | 26.04 | 27.64 |
| More than three months | 33.43 | 18.85 | 34.05 | 29.14 |
| Total | 100 | 100 | 100 | 100 |

**Table 3.10. 49:** Trust towards the services given by Women development army

| Trust services given by WDAs | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| | % | % | % | % |
| Always | 76.78 | 80.26 | 78.98 | 78.14 |
| Some times | 18.97 | 15.72 | 16.46 | 17.64 |
| Never | 4.25 | 4.02 | 4.56 | 4.22 |
| Total | 100 | 100 | 100 | 100 |

## **3.11.** Housing condition

**Table 3.11. 1:** Type of house

| Type of house | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| | % | % | % | % |
| CIS | 59.23 | 64.09 | 65.93 | 61.79 |
| Hidmo | 31.4 | 2.91 | 21.13 | 20.39 |
| Villa | 5.97 | 23.05 | 6.11 | 11.74 |
| G+1 separated | 2.19 | 2.54 | 5.28 | 2.73 |
| G+1 attached | 0.47 | 2.76 | 0.71 | 1.27 |
| G+2 and above separated | 20 | 0.65 | 0.3 | 0.37 |
| G+2 and above attached | 0.08 | 0.65 | 0.12 | 0.28 |
| Others | 47 | 3.34 | 0.42 | 1.43 |
| Total | 100 | 3.34 | 100 | 100 |

**Table 3.11. 2:** Distribution of ownership of housing

| Ownership of house | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| | % | % | % | % |
| Our own | 88.85 | 51.94 | 70.62 | 73.95 |
| Rented from kebele, government | 0.26 | 2.63 | 0.59 | 1.1 |
| Rented from private | 6.32 | 38.03 | 23.09 | 19.27 |
| Given from employer | 0.17 | 0.66 | 0.36 | 0.36 |
| Given from employer with reasonable cost | 0.03 | 0.17 | 0.06 | 0.08 |
| Others | 4.36 | 6.57 | 5.28 | 5.23 |
| Total | 100 | 100 | 100 | 100 |

Table 3.11. 3: Distribution of households by construction material of wall

| Material of wall | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| | % | % | % | % |
| Brick and cement | 1.12 | 8.14 | 3.74 | 3.83 |
| Stone and cement | 5.28 | 29.34 | 23.86 | 15.91 |
| Stone and mud | 74.09 | 14.06 | 38.93 | 49.10 |
| Blocket and cement | 1.3 | 25.80 | 7.6 | 10.39 |
| Wood and mud | 16.13 | 21.30 | 19.05 | 18.27 |
| Wood and grass | 0.92 | 0.27 | 1.01 | 0.71 |
| Others | 1.16 | 1.10 | 5.82 | 1.78 |
| Total | 100 | 100 | 100 | 100 |

**Table 3.11. 4:** Distribution of households by construction materials of roof

| Material of roof | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| | % | % | % | % |
| CIS | 64.82 | 82.11 | 85.7 | 73.50 |
| Concrete and cement | 0.47 | 13.87 | 1.48 | 5.10 |
| Grass | 8.55 | 1.05 | 3.8 | 5.38 |
| Wood and mud | 20.66 | 1.83 | 6.77 | 12.43 |
| Wood, mud, grass and stone | 4.77 | 0.54 | 1.48 | 2.89 |
| Others | 0.73 | 0.61 | 0.77 | 0.70 |
| Total | 100 | 100 | 100 | 100 |

The single most commonly used material for flooring in Tigray is earth accounting (69.41%). The proportion of earth flooring being used in Tigray is higher than the proportion in Ethiopia which is (55%) (EDHS 2016).

Table 3.11. 5: Distribution of households by construction materials of floor

| Material of floor | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| | % | % | % | % |
| Soil and mud | 92.8 | 34.21 | 65.64 | 69.41 |
| Wood | 0.34 | 1.83 | 0.24 | 0.84 |
| Cement and concrete | 5.98 | 50.43 | 31.28 | 24.37 |
| Plastic | 0.06 | 0.59 | 0.18 | 0.25 |
| Terrazzo | 0.56 | 11.90 | 2.43 | 4.62 |
| Others | 0.23 | 1.05 | 0.24 | 0.51 |
| Total | 100 | 100 | 100 | 100 |

**Table 3.11. 6:** Distribution of households by type of kitchen

| Type of kitchen | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| | % | % | % | % |
| Modern | 2.64 | 23.80 | 7.48 | 10.39 |
| Modern shared | 0.71 | 13.27 | 3.2 | 5.26 |
| Traditional private | 68.06 | 25.58 | 57.69 | 52.41 |
| Traditional shared | 4.08 | 14.68 | 5.04 | 7.76 |
| No kitchen | 24.05 | 21.79 | 26.35 | 23.61 |
| Other | 0.47 | 0.88 | 0.24 | 0.57 |
| Total | 100 | 100 | 100 | 100 |

Despite the fact that most households have >=5 family size, households in the study area did not have separate rooms for sleeping accounting (51.80%).

**Table 3.11. 7:** Distribution of households by separate bed room

| Have separate bed room | Rural | | Urban | | Infant towns | | Regional |
|---|---|---|---|---|---|---|---|
| | Wgt% | % | Wgt % | % | Wgt% | % | % |
| Yes | 40.67 | 40.59 | 63.46 | 62.24 | 43.44 | 43.15 | 48.20 |
| No | 59.33 | 59.41 | 36.54 | 37.76 | 56.56 | 56.85 | 51.80 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

**Waste management**

Significant number of households in Tigray is still defecating in the open (28.87%), while only (36.71%) are using dry pit latrine. Overall 70.06% of Tigray households are using improved toilet facilities. Besides, (56.02%) HOUSEHOLDs in Tigray does not have means to dispose their wastes properly, they dispose their wastes to open field, rivers and burned in an open.

**Table 3.11. 8:** Distribution of household by type of latrine

| | Rural | | Urban | | Infant towns | | Regional |
|---|---|---|---|---|---|---|---|
| Type of latrine | Wgt % | % | Wgt % | % | Wgt % | % | % |
| Dry pit latrine | 38.15 | 38.39 | 30.16 | 32.11 | 50.65 | 51.85 | 36.71 |
| VIP latrine | 2.88 | 2.93 | 41.17 | 39.05 | 7.71 | 7.52 | 21.07 |
| Water flush latrine | 0.92 | 0.91 | 20.10 | 20.17 | 3.10 | 3.13 | 10.56 |
| Public latrine | 0.16 | 0.15 | 3.62 | 3.34 | 0.20 | 0.23 | 1.72 |
| Open field /bush | 56.29 | 56.04 | 4.61 | 4.76 | 36.95 | 35.88 | 28.87 |
| Other | 1.61 | 1.58 | 0.34 | 0.56 | 1.38 | 1.39 | 1.06 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

**Table 3.11. 9:** Distribution of households by solid waste management

| | Rural | | Urban | | Infant towns | | Regional |
|---|---|---|---|---|---|---|---|
| Waste management | Wgt% | % | Wgt% | % | Wgt% | % | % |
| Municipality | 5.51 | 5.39 | 78.18 | 79.04 | 45.74 | 46.53 | 35.85 |
| Private organizations | 0.98 | 0.96 | 15.33 | 14.93 | 2.39 | 2.26 | 5.84 |
| Disposed to open field | 58.72 | 58.94 | 2.27 | 2.21 | 28.99 | 28.78 | 35.68 |
| Disposed to river | 18.52 | 18.42 | 1.78 | 1.65 | 11.69 | 11.34 | 11.80 |
| Burned | 11.93 | 11.94 | 1.79 | 1.58 | 8.51 | 8.55 | 7.98 |
| Others | 4.34 | --- | 0.65 | 0.61 | 2.68 | 2.55 | 0.56 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

Majority of households in Tigray do not have access to Telephone (65.01%).

**Table 3.11. 10:** Distribution of households by Telephone access

| Availability of telephone | Rural % | Urban % | Infant % | Regional % |
|---|---|---|---|---|
| Within the house | 25.41 | 48.86 | 38.34 | 34.99 |
| In neighbor | 9.02 | 4.75 | 5.93 | 7.18 |
| Five minutes from the house | 0.73 | 1.09 | 1.07 | 0.89 |
| Greater than five minutes from the house | 1.94 | 0.92 | 2.49 | 1.68 |
| We are not users | 55.41 | 33.30 | 44.57 | 46.56 |
| Other | 7.49 | 11.08 | 7.6 | 8.70 |
| Total | 100 | 100 | 100 | 100 |

**Access to health facility**

Access to health facility and trust towards the services as perceived by respondents, majority (95.16%) of HOUSEHOLDs had access to health facility, the nearest health facility reported was health center accounting (57.97%).

**Table 3.11. 11:** Distribution of households by access to Health facility

| Access to health facility | Rural % | Urban % | Infant % | Region % |
|---|---|---|---|---|
| Yes | 93.48 | 97.97 | 94.66 | 95.16 |
| No | 5.28 | 1.42 | 4.69 | 3.90 |
| I dont know | 1.24 | 0.60 | 0.65 | 0.95 |
| Total | 100 | 100 | 100 | 100 |

**Table 3.11. 12:** Distribution of households to the nearest health facility

| Nearest health facility | Rural % | Urban % | Infant % | Regional % |
|---|---|---|---|---|
| Health post | 48.57 | 3.58 | 17.86 | 29.34 |
| Health center | 48.62 | 67.07 | 71.81 | 57.97 |
| Government hospital | 1.68 | 19.63 | 8.55 | 8.61 |
| NGO hospital | 0.03 | 0.84 | 0.47 | 0.36 |
| Private hospital | 0.05 | 2.00 | 1.13 | 0.85 |
| Private clinic | 0.23 | 6.59 | 0.18 | 2.34 |
| Others | 0.82 | 0.30 | --- | 0.53 |
| Total | 100 | 100 | 100 | 100 |

**Table 3.11. 13: Time taken by HOUSEHOLDs to reach health post**

| Distance taken to reach health post | Rural | | Urban | | Infant towns | | Regional |
|---|---|---|---|---|---|---|---|
| | Wgt% | % | Wgt% | | Wgt% | % | % |
| <=30 minutes | 74.30 | 74.34 | 94.74 | 94.61 | 92.03 | 92.11 | 78.02 |
| 31-60 minutes | 17.33 | 17.28 | 5.24 | 5.12 | 5.72 | 5.64 | 14.86 |
| 61-120 minutes | 6.41 | 6.43 | 0.28 | 0.28 | 1.54 | 1.54 | 5.41 |
| >= 121minutes | 1.83 | 1.83 | --- | --- | 0.47 | 0.47 | 1.55 |
| I don't know | 0.13 | 0.12 | --- | --- | 0.24 | 0.24 | 0.15 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

**N.B. 1hr is equivalent to 5km**

Among the households in Tigray only (66.15%) have access to health centers in<=30 minutes, following 60 minutes (15.70%), the rest are traveling two hrs. and beyond to get service in health centers.

**Table 3.11. 14:** Time taken by HOUSEHOLDs to reach the nearest health center

| Distance taken to reach health center | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| | % | % | % | % |
| <=30 minutes | 47.55 | 90.81 | 82.37 | 66.15 |
| 31-60 minutes | 21.67 | 8.82 | 8.19 | 15.70 |
| 61-120 minutes | 20.23 | 0.35 | 5.58 | 11.87 |
| >= 121minutes | 10.56 | 0.03 | 3.86 | 6.28 |
| Total | 100 | 100 | 100 | 100 |

**N.B 1hr is equivalent to 5kms**

**Table 3.11. 15:** Distribution of household by cooking energy source

| House hold cooking energy | Rural | Urban | Infant | Regional |
|---|---|---|---|---|
| | % | % | % | % |
| Electricity | 5.05 | 52.63 | 29.91 | 25.25 |
| Gas | 0.28 | 1.34 | 0.18 | 0.64 |
| Charcoal, gas and faire wood | 11.87 | 23.63 | 9.08 | 15.66 |
| Charcoal and faire wood | 58.78 | 20.06 | 51.45 | 44.07 |
| Faire wood | 23.64 | 1.19 | 8.72 | 13.68 |
| Others | 0.39 | 1.14 | 0.65 | 0.69 |
| Total | 100 | 100 | 100 | 100 |

# 4. Conclusion and recommendation

## 4.1. Conclusion

The findings of the socio-economic baseline survey focusing on demography and education have some implications for policy making by concerned sector offices. The fact that the proportion of young people in the region is on the rise presents its own challenges and opportunities. On one hand, this economically active segment of society can be mobilized to stir up development in the region; on the other hand, if kept idle, this age group can be source of unrest, political upheaval and violence as well as criminal tendencies. Therefore, demographic dynamics in the region point to the need for catering for growing youth population in rural and urban areas; this includes enhanced efforts to provide employment opportunities. The homogeneity in the region in terms of ethnicity can be attributable to different factors that are not necessarily covered in the present socio-economic baseline survey. However, in the context of the current ethno-federal arrangement in the country, it only gives sense to enhance inter-ethnic diversities within each regional state to give impetus to Ethiopian nationalism and unity. This can be done through the creation of enabling environment for economic and social interactions among various groups.

Results of the socio-economic baseline survey clearly attest to the increased coverage and access to education at various levels. Schools and other facilities such as milling services and banks are located within easy reach. However, informants have expressed concern over the declining quality of education at all levels. Bad policies, poorly trained teachers with low level of motivation to deliver knowledge, the lack of proper monitoring and evaluation of the teaching-learning process and negligence from parents and teachers are some of the major factors that infringe on delivery of up-to the standard education. Hence, there is a need for a concerted effort by all pertinent stakeholders. Existing policies must be revised, repealed and replaced by new ones as deemed necessary.

Farming is among the activities in which people are engaged to lead their life. Region wise, 53.5 % of the householders were engaged in the farming activity among which 27% were females. The regional average land holding used for crop production was 0.6 ha. The majority of the householders (78%) own smaller land size (0.01-1.0 ha. In line with this, the productivity of crops obtained in this survey was lesser by 27-70% compared with the productivity of crops

reported by CSA (2018) for the crop harvested in 2017/18. Crop productivity data reported in this report was based on the questionnaire and household self report, which asked how much they harvested per unit area. However, farmers deliberately or not might not tell the correct productivity. In the contrary, crop productivity reported by CSA was based on measurement from a unit of sampled plots.

With regard to possession of ox, sufficiency of labour and other productive assets, which are essential for effective crop production, 34% of the total households had no ox, while 28.6% of the households' had only one ox that could be used for ploughing. Among those households who hadn't ox, 17% each were male and females. Among those which had one ox, 24.4% were male and 4.2% were female households. Generally, these results indicate less possession of ox by females which could force them to rent or share-out their farmlands. Furthermore, 53% of the households in the region responded to sufficiency of own labour to run their farm activities while 45% responded to insufficiency. Farmers face labour shortages during harvesting and threshing, and weeding.

Use of high yielding and clean seeds is one of the important inputs to enhance crop productivity. Farmers use either local seeds and/or improved seeds. Among the total household respondents, only 79% used improved seeds, while 21% of the households responded to using improved seeds. Regionally, the practice of using improved seeds was low. When regarded by crop type, tef wheat and maize were the ones which most of the farmers use. About 79% of the households that responded of not using improved seeds said higher seed price constrained them for not using improved seeds while 8% of respondents attributed to non-availability of improved seeds.

Low soil fertility is among the major constraints in Tigray region that reduces crop productivity. Poor soil fertility is attributed to the overall land degradation. As a means of maintaining or improving soil fertility 24% of the householders responded to applying commercial fertilizers while 20 % of the householders said they applied both commercial and manure for improving soil fertility. Availability of commercial fertilizers had not been a constraint. It is, however, noted that 79-89% of the respondents used less than 50 kg of Urea, DAP and other type of fertilizers. This seems quite a low amount of fertilizer consumption to improve soil fertility and thereby enhance crop productivity. Furthermore, 41% of the respondents consumed 51-100 kg of

Urea and DAP each per ha, while another 40% of the respondents consumed below 50 kg of Urea and DAP each per ha.

According to the majority of the respondents, drought occurred once or twice every five years. When the different householders were asked about the cause of drought, 42% of them indicated the curse of God, while 13% of the respondents attributed to environmental degradation. The view of the respondents towards overpopulation and environmental degradation as a cause was very low. When suggesting in overcoming drought, 38% of the respondents said praying to God as the main solution, while 18% said environmental protection was the main solution.

Livestock production is part of the mixed farming system of Tigray. Most people are engaged in livestock production activities especially in rural areas. Urban livestock agriculture is one option of business for urban dwellers with land availability is the key problem. Livestock production is run using endogenous animal breeds which are blamed for poor performance. Crop residues and hay are the major feed resource bases and feed shortage is the serious problem. The use of improved fodder and agro-industrial byproducts as source of animal feed is very limited for various reasons. Rural holders face big problem in drinking water for animals which are forced to trek long distance. There is death of animals due to poor health extension services related with irregular vaccination, poor supply of drugs, inadequate manpower and illegal smuggling of veterinary drugs. Animal death is more pronounced in chicken due to Newcastle disease. Economic loss due to animal death discourages livestock producers. Most holders use free mating system which causes less performance and inbreeding problem. Moreover, the use of AI is limited to few holders who complain about AI inefficiency on the pain of reproductive failure (rebreeding). More people are engaged in dairy and poultry production. High cost and less supply of improved dairy cows and chickens limit the involvement of people in these agro-business ventures. The involvement of people in beekeeping is less despite the potentiality of the region. High cost of modern beehive is the limiting factor in beekeeping. Fewer holders (2 – 15 percent) are involved in the various livestock extension packages. The livestock extension system is very fragile and weak to deliver full pledged services to beneficiaries.

Households in the surveyed zones have possessed different assets. The proportion of mobile ownerships of respondents at regional level is higher than the country level. The proportion of

respondents who used traditional Megogo is still high and improved stove low. This implies that there is a high demand for fire wood and may result in deforestation of the forest resources.

Income and poverty analysis: the survey has tried to collect households' income sources, income amount from the different sources, household consumption expenditures and thereby estimated poverty level of the region. Household income response was found to be full of missing and excessively underestimated and to some extent, some zones reported to have an expectedly high level of agricultural income such as South east. As a result, household income could not be used for poverty estimation. Similar to other poverty estimation (including Federal Democratic Republic of Ethiopia), household expenditure was found to be the preferred one. Since, the survey period has fallen in the months of May to June and these months are months in the year where food availability starts to dwindle for most households, especially in rural areas. As a result poverty estimation based on the underestimated (un representative) state of consumption, might result in a poverty estimation rate which is slightly increased level.

In urban areas, mounting inflation has resulted in diminishing the purchasing power of money. Thus, for many households it is not easy to fulfill all households' expenditures and save money. However, lack of saving culture and expenditure controlling habits of respondents are some of the major obstacle for households to save.

The most frequently cited purpose of farmers contacting extension agents was to get advice on chemical fertilizers. This is the reason that extension agents meet farmers to convince them to purchase chemical fertilizers.

Some of the parameters are treated as weighted and unweighted to compare and see the variation of survey results if any. However, both weighted and unweighted results show very similar results. Thus, most analysis is carried out using the unweignted data.

The average regional coverage to improved/protected water sources (piped systems, boreholes, protected spring/ hand dug wells, bottled water) of region, urban, infant town and urban areas are 85.3%, 97.1%, 88.7% and 77.1% respectively. Out of these, about 90% of urban, 84% of infant towns and 64.5 % of rural people are getting water from piped system (i.e. either inside their compound or from yard/shared stand pipe).

The access to water supply is calculated using the daily water consumption as obtained from the household through questioner; hence the result seems a bit underestimated. On the other hand, the coverage calculated by the water bureau is exaggerated and does not fit to the actual water problems prevailing in the region as it is calculated based on daily production. Thus, the bureau has to revise and rectify the access water coverage by using daily water consumption of the household.

About 65.3 % of the populations in the rural area of Tigray walk more than 15minte (equivalently >1km) to fetch drinking water. Moreover, 61.2% of the respondents also confirmed that adult female are responsible to bring water from their sources suggesting that still females have more burden than male in the household. This will obviously have an effect the woman's ability to engage in other income generating activities, cultural and political involvement, rest and recreation.

The major problems in the town water supply services includes sustainability problem (e.g. frequent interruption, drying up of water sources), less coverage, and poor quality. For instance, the survey carried out on water supply interruption shows more than 75% of the respondents answered that there is a critical water supply failure (interruption) in all big towns of the region.

The survey results showed that the irrigation coverage in the region is also very low, which is 3.9%. However, the coverage is relatively higher in the rural areas (5.84%) as compared to the urban and infant towns.

The main source of water supply for irrigation in Tigray region are river diversion (33.3%), spring (26.6%), dam (14.6%), Private Hand dug well (HDW) (13.5%), and others . For instance, 176 landholders use river water to irrigated 83.5ha, 133 landholders use spring water to irrigate 67.2ha land, and 76 landholders use dams to irrigate 48.3ha land etc. at regional level.

The maternal and child health, health extension and women development army, harmful traditional practices, access to facilities, community based health insurance and environmental health activities are some of the major issues determined in this baseline survey. Accordingly, ANC, home delivery and PNC in mothers from Tigray was 48.44%, 32.18% and 54.15% respectively. Similarly, the health extension and women development activities are determined.

Thus, the percentage of household who were reported to have knowledge of the health extension and women development army activities was 65.92% and 40.57% respectively. The frequency of home visit by them seems to be variable from household to household; some of them get home vist within a month 39.31%, while others are getting the visit after three months or more 32.26%. About 79.19% and 78.14% of households had trust about their services of health extension and women development army. Similarly 5.46% and 80.75% of under five children in Tigray had circumcision and uvula cutting. More than three fourth (95.16%)of the households reported that they had access to health facilities ( health post and health center) within the recommended standard walk 1 hr and 2hrs to reach the health posts and health centers, respectively. With regard to the community based health insurance utilization, only (32.7%) of the households had membership. The main reasons for none users were lack of awareness 60.35%, no money to pay 21.58%, and the service is not dependable 7.97% respectively. Slightly below one third of the households had vaccination for their last child. Nearly one third (28.87%) of the households in Tigray defecate in the open. About 56.02% of households dispose their wastes improperly to the environment.

### 4.2. Recommendations:

Based on the data analysis, the following major recommendations are forwarded:

- Crop productivity needs to be further studied by taking representative sample fields from different soil types and agro-ecology for each of the major crops grown in the region. This is among the important task to be urgently done so that interventions including provision of technologies and inputs that enhances crop productivity of the region should be based upon the measured crop productivity and constraints in the different agroecology.
- Female headed householders whose life depended on crop production had less possession of ox for ploughing their land and they need special support by which they would be able to retain and work on their farm land instead of renting out.
- Since farmers face labour shortages especially during harvesting and threshing, and weeding, technologies which ease labour shortages in these critical farming activities (threshing machines, cost and technically effective and environmentally friendly herbicides) needs to be supplied to farmer).

- Improved seeds of major crops varieties should be supplied in sufficient quantity. Further more, supply of improved seeds for a given crop variety must be based on its adaptability to a given agroecology to which it should be supplied.
- Even though, there are significant improvements in understanding the importance of fertilizers in increasing crop productivity, still a lot of work in extension services is needed to identify the right type of fertilizer and improve the rate of application in accordance to soil types and moisture conditions.
- The awareness of the people towards the cause of drought and land degradation, and the means of reducing its impact was low. Hence, farmers, in this regard, should be taught at all levels (school, church, farmers training centers etc) so that they understand what really
- Urban livestock agriculture is one of an agribusiness option for urban dwellers. However, there is complaining from urban holders about land availability for establishment and expansion of livestock farms. It is better to consider landless holders in the urban land use system.
- Livestock production is practiced using indigenous breeds which are blamed for low genetic potential. The attempt to improve the performance of animals with selection and crossbreeding should be strengthen at most and best.
- Feed shortage is the most limiting factor in livestock production and crop residues are the common feed resources which demand research and development attention for improvement. There is a need to introduce improved livestock feeds and feeding technologies.
- Attempts should be made to improve the awareness of livestock holders for wider use of agro-industrial byproducts as feed source for animals.
- Create awareness on holders for wider adoption and use of improved fodder.
- Develop and promote well adapted and productive improved fodder species and varieties.
- Establish water points in near villages to improve access of drinking water for animals.
- Establish strong animal health extension services through promoting disease prevention and control measures such as regular vaccination, timey supply of vaccines and drugs, recruiting competent manpower, promoting staff capacity building and controlling irregular smuggling of veterinary drugs.

- Develop feasible and cost-effective regional disease prevention and control strategies for specific priority diseases.
- Create awareness on the livestock community regarding the importance of controlled animal breeding method and disadvantages of free mating system related with adoption of zero grazing system.
- Mobilize the livestock community for wide use of AI. In addition, efforts must be made to address the reproductive failure (rebreeding problem) due to AI inefficiency, which could be solved in view of poor cow preparation, poor semen quality, poor semen handling and incompetent AI technicians.
- Less availability and high cost of improved dairy cows and chickens is the key problem for dairy and poultry producers. Conditions must be created to supply improved cows/heifers and day-old chicks at reasonable costs to the beneficiaries.
- Considering potentiality of the region for beekeeping, mobilize and encourage more people and landless youth to be involved in beekeeping practice.
- Deliver alternative beehives at fair price to the beekeepers for better adoption and use of modern hives.
- Promote overall efforts to improve honey yield to realize the regional bench mark (20 kg for traditional hive and 45 kg for modern hive).
- Mobilize and encourage more livestock holders to be involved in the various livestock extension packages (dairy, fattening, poultry, beekeeping development).
- Establish strong livestock extension system as independent core process, pledged with full mandate, manpower and budget. pledge
- It is not possible to use electiric Megogo in areas where there is no access to electricity. However, the low utilization of improved stoves could be boosted to protect the deforestation of the forest resources. However, rural electrification is the long lasting solution for to prevent the destruction of forest resources.
- The estimated poverty level of the region is slightly higher than the poverty level estimated by National Planning Commission in 2017. Although the current study has sample size superiority, adopted a methodological approach similar to the CSA (it was set in consultation with CSA) and but a survey period which falls in a period where food availability (especially in rural areas) starts to decline. First, to check the reliability and

triangulate the current estimation another round of household survey (even with smaller sample size) should be conducted, picking representative months of the year (February-April). Second, so as to establish a panel data for the region which can be used for various policy design and effectiveness analysis future survey with 2-3 years interval should be scheduled. As much as possible the same households should be traced, in case of failure to trace the survey should continue with replacement. Third, the survey should be administered with well planned schedule: picking an appropriate survey period, mobilize external resources (by writing grant proposal), well coordinated with Policy Study Institute of Tigray and other relevant stakeholders.

- There is an improvement on the saving culture of communities. But the expenditure controlling habit of most respondents was found to minimal. There is still a trend in wasting money in different social and religious festivities. There must be a planned work to change the expenditure controlling attitude of the community be financial institutions, saving and credit associations, Equb and elders.
- The most frequently cited purpose of group meeting with extension agents was to get advice on chemical fertilizers. In the sowing time, extension agents meet farmers to convince them to purchase chemical fertilizers. Extension agents should have a planned schedule to advice farmers in the areas of their specializations. Chemical fertilizers sells should not be the ultimate purpose of extension experts. Rather, they should support the farmers in the areas of their specialization such as irrigation, livestock, natural resources and crop production.
- It is better if the bureau can revise the water coverage calculation using the daily consumption of the house hold instead of using a daily water production. In the towns this can easily be achieved by using water bills while in the rural areas, a daily record of number of jericans can be introduced. Otherwise, the current coverage claimed by the bureau is too far from the reality in the ground as also checked using some water bills of some households, and focus group discussions held with the community
- Generally, detail inventory survey of the water supply should be carried out to minimize the big gaps created between the water production and actual consumption of the household

- Revisiting the health extension and women development army activities on maternal and child health, environmental health activities, to sustained and bring the desired changes in health in the region.
- Improve ANC, delivery and PNC services through the involvement of all actors.
- Giving special consideration of remote places, transport and awareness creation among mothers will bring changes
- Emphasis should be given to environmental health activities in the region to tackle the prevailing health problems.
- Periodically evaluate the strength and quality of community health insurance services using relevant measures of success, use and quality of community health insurance services.

# Appendices at zonal level (urban)

### 3.1.1. Demographic characteristics

**Appendix Table 3.1.1: Family size of the surveyed by administration zone**

| Family size | Administrative zone | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mekelle | | Southern | | North western | | Western | | eastern | | central | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| 1 | 157 | 9.78 | 56 | 8.22 | 22 | 4.59 | 11 | 4.70 | 27 | 5.79 | 52 | 7.38 |
| 2 | 208 | 12.77 | 104 | 15.27 | 54 | 11.27 | 29 | 12.39 | 47 | 10.08 | 92 | 13.07 |
| 3 | 325 | 20.24 | 137 | 20.11 | 85 | 17.74 | 46 | 25.21 | 92 | 19.74 | 138 | 19.60 |
| 4 | 334 | 20.81 | 147 | 21.58 | 93 | 19.41 | 59 | 25.21 | 100 | 21.45 | 122 | 17.33 |
| 5 | 248 | 15.46 | 111 | 16.30 | 82 | 17.11 | 37 | 15.81 | 83 | 17.81 | 134 | 19.03 |
| 6 | 173 | 10.78 | 55 | 8.07 | 73 | 15.24 | 23 | 9.83 | 62 | 13.30 | 91 | 12.92 |
| 7 | 94 | 5.85 | 45 | 6.60 | 38 | 7.93 | 17 | 7.26 | 32 | 6.86 | 56 | 7.95 |
| 8 | 38 | 2.36 | 13 | 1.90 | 15 | 3.13 | 7 | 3 | 15 | 3.22 | 10 | 1.42 |
| 9 | 14 | 0.87 | 9 | 1.32 | 10 | 2.08 | 5 | 2.13 | 6 | 1.29 | 7 | 0.99 |
| 10 | 10 | 0.62 | 4 | 9.58 | 5 | 1.04 | - | | 1 | 0.21 | 1 | 0.14 |
| 11 | 2 | 0.12 | - | - | - | - | 1 | 0.43 | 1 | 0.21 | 1 | 0.14 |
| 12 | 2 | 0.12 | - | - | 2 | 0.41 | - | - | - | - | - | - |
| Total | 1,605 | 100.00 | 681 | 100.00 | 479 | 100.00 | 234 | 100.00 | 466 | 100.00 | 704 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3. 1.8: Occupation of the surveyed households by zone**

| Occupation | Administration zone | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mekelle | | Southern | | N.western | | Western | | Eastern | | Central | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Private business employer | 100 | 6.23 | 22 | 3.23 | 18 | 3.76 | 11 | 4.68 | 21 | | 30 | 4.26 |
| Own account worker | 330 | 20.56 | 116 | 17.03 | 133 | 27.77 | 42 | 17.87 | 72 | | 122 | 17.33 |
| HOUSEHOLD female business activity | 75 | 4.67 | 51 | 7.49 | 12 | 2.51 | 4 | 1.70 | 47 | | 55 | 7.81 |
| Civil servant | 274 | 17.07 | 121 | 17.77 | 61 | 12.73 | 38 | 16.17 | 62 | | 119 | 16.90 |
| Public sector enterprise employee | 22 | 1.37 | 3 | 0.44 | 4 | 0.84 | 2 | 0.85 | 7 | | 10 | 1.42 |
| Private organization employee | 184 | 11.46 | 49 | 7.20 | 23 | 4.80 | 13 | 5.53 | 23 | | 42 | 5.97 |
| International organization employee | 10 | 0.62 | 2 | 0.29 | 1 | 0.21 | - | - | 2 | | 1 | 0.14 |
| Producer or service cooperative employee | 4 | 0.25 | 2 | 0.29 | 2 | 0.42 | - | - | 2 | | 3 | 0.43 |
| Producer or service cooperative member | 11 | 0.69 | 5 | 0.73 | 4 | 0.84 | - | - | -- | | 3 | 0.43 |
| Casual worker | 154 | 9.60 | 81 | 11.89 | 41 | 8.56 | 29 | 12.34 | 68 | | 85 | 12.07 |
| Domestic worker | 9 | 0.56 | 7 | 1.03 | 5 | 1.04 | - | - | 2 | | 8 | 1.13 |
| Farmer or livestock lender | 25 | 1.56 | 87 | 12.78 | 52 | 10.86 | 50 | 21.28 | 18 | | 48 | 6.81 |
| Pensioner | 76 | 4.74 | 31 | 4.55 | 12 | 2.51 | 3 | 1.28 | 39 | | 63 | 8.95 |
| Job seeker but unemployed | 37 | 2.31 | 12 | 0.02 | 14 | 2.92 | 5 | 2.13 | 20 | | 13 | 1.85 |
| Unemployed but not job seeker | 19 | 1.18 | 3 | 0.44 | 2 | 0.42 | - | - | 16 | | 14 | 1.99 |
| Disabled and unable to work | 17 | 1.06 | 3 | 0.44 | 5 | 1.04 | - | - | 2 | | 7 | 0.10 |
| Student | 17 | 1.06 | 5 | 0.73 | 1 | 0.21 | - | - | - | | - | - |
| Housewife | 141 | 8.79 | 50 | 7.34 | 55 | 11.48 | 27 | 11.49 | 40 | | 45 | 6.40 |
| Unpaid family worker | 6 | 0.37 | 1 | 0.15 | 1 | 0.21 | 1 | 0.43 | 1 | | 4 | 0.57 |
| Child, with domestic and other | - | - | 1 | 0.15 | - | - | = | - | - | | - | - |
| Child, too young to work | - | - | 1 | 0.15 | - | - | - | - | - | | - | - |
| Other | 94 | 5.86 | 28 | 4.11 | 32 | 6.68 | 9 | 3.82 | 24 | | 32 | 4.55 |
| Total | 1605 | 100.00 | 681 | 100.00 | 479 | 100.00 | 235 | 100.00 | 466 | | 704 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.1.9: Marital status of household heads by administrative zones**

| Administrative zones | Single | | Married | | widowed | | divorced | | Separated | |
|---|---|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | No. | % | No. | % |
| Southern | 49 | | 343 | | 103 | | 163 | | 23 | |
| Mekelle | 195 | | 851 | | 225 | | 263 | | 71 | |
| Eastern | 36 | | 258 | | 74 | | 70 | | 28 | |
| Central | 47 | | 417 | | 92 | | 116 | | 32 | |
| Western | 9 | | 167 | | 27 | | 26 | | 6 | |
| South Western | 27 | | 318 | | 50 | | 56 | | 28 | |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.1.10: Ethnicity of the surveyed households by administrative zones**

| Ethnicity | Administration zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Southern | | Mekelle | | Eastern | | Central | | western | | Northwestern | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Tigraway | 649 | 95.30 | 1581 | 98.57 | 456 | | 702 | 99.72 | 206 | 87.66 | 461 | 96.24 |
| Amhara | 32 | 4.70 | 19 | 1.43 | 2 | | = | | 25 | 10.64 | 12 | 2.50 |
| Kunama | - | - | - | - | - | - | - | - | - | - | 2 | 0.42 |
| Erob | - | - | 2 | - | 8 | - | - | - | - | - | 1 | 0.21 |
| Agew | - | - | - | - | - | - | - | - | - | - | 1 | 0.21 |
| Oromo | | | 1 | -- | = | - | 2 | 0.28 | 3 | 1.28 | 2 | 0.42 |
| Other | = | = | 1 | | - | - | - | - | 1 | 0.42 | - | - |
| Total | 681 | 100.00 | 1604 | 100,00 | 466 | | 704 | 100.00 | 235 | 100.00 | 479 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.1.11: Religious composition of the surveyed households by administrative zones**

| Religion | Administration zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | southern | | Mekelle | | Eastern | | Central | | Western | | N. Western | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Orthodox | 632 | 92.80 | 1,527 | 95.14 | 450 | 96.57 | 657 | 93.32 | 221 | 94.04 | 434 | 90.61 |
| Catholic | 1 | 0.15 | 6 | 0.37 | 7 | 1.50 | 1 | 0.14 | 1 | 0.43 | - | - |
| Protestant | - | - | 3 | 0.19 | 1 | 0.21 | - | - | 1 | 0.43 | - | - |
| Muslim | 48 | 7.05 | 69 | 4.30 | 7 | 1.50 | 46 | 6.54 | 12 | 5.10 | 45 | 9.39 |
| Other | - | - | - | | 1 | 0.21 | - | - | - | - | - | - |
| Total | 681 | 100.00 | 1,605 | 100.00 | 466 | 100.00 | 704 | 100.00 | 235 | 100.00 | 479 | 100.00 |

(Socio-economic baseline survey, 2018)

### 3.2. Education

**Appendix Table 3.2.1: Distribution of responses of surveyed households on literacy status by administration zone**

| Literacy status | Administration zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Southern | | Mekelle | | Eastern | | Central | | Western | | N. Western | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Yes | 339 | 49.71 | 573 | 38.07 | 212 | 45.49 | 354 | 50.28 | 153 | 65.11 | 274 | 57.20 |
| No | 343 | 50.29 | 932 | 61.93 | 254 | 54.51 | 350 | 49.72 | 82 | 34.89 | 205 | 42.80 |
| Total | 682 | 100.00 | 1,505 | 100.00 | 466 | 100.00 | 704 | 100.00 | 235 | 100.00 | 479 | 100.00 |

(Socio-economic baseline survey, 2018)

## Appendix Table 3.2.2: Educational status of the surveyed households

| Educational status | Administration zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mekelle | | Southern | | N.Western | | Western | | Eastern | | Central | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Illiterate | 325 | 20.25 | 186 | 27.31 | 125 | 26.10 | 54 | 22.98 | 153 | 32.90 | 225 | 34.35 |
| Elder/adult education | 25 | 1.56 | 32 | 4.70 | 51 | 10.64 | 16 | 6.80 | 12 | 2.60 | 12 | 1.83 |
| Religious | 32 | 1.99 | 8 | 1.17 | 36 | 7.52 | 14 | 5.96 | 12 | 2.60 | 20 | 1.07 |
| Not finished primary | 195 | 12. 15 | 86 | 12.63 | 69 | 14.40 | 26 | 11.06 | 40 | 8.60 | 76 | 11.60 |
| Finished primary | 65 | 4.05 | 27 | 3.96 | 27 | 5.63 | 17 | 7.23 | 20 | 4.30 | 41 | 6.26 |
| Grade seven completed | 68 | 4.24 | 28 | 4.11 | 11 | 2.29 | 10 | 4.26 | 25 | 5.38 | 34 | 5.19 |
| Eighth grade completed | 110 | 6.85 | 27 | 3.96 | 21 | 4.38 | 20 | 8.51 | 36 | 7.74 | 54 | 8.24 |
| Nine grade competed | 45 | 2.80 | 12 | 1.76 | 13 | 2.71 | 10 | 4.26 | 14 | 3.01 | 19 | 2.90 |
| Tenth grade completed | 197 | 12.27 | 53 | 7.78 | 43 | 8.98 | 20 | 8.51 | 57 | 12.26 | 71 | 10.84 |
| Eleventh grade completed | 45 | 2.80 | 12 | 1.76 | 16 | 3.34 | 6 | 2.56 | 6 | 1.30 | 7 | 1.07 |
| Twelfth grade completed | 100 | 6.23 | 42 | 6.17 | 10 | 2.08 | 5 | 2.13 | 12 | 2.60 | 24 | 3.66 |
| TTI completed | 14 | 0.87 | 4 | 0.59 | 1 | 0.21 | 2 | 0.85 | 5 | 0.10 | 5 | 0.76 |
| Technic 1 completed | 15 | 0.93 | 16 | 2.35 | - | - | 1 | 0.43 | - | - | 2 | 0.31 |
| Technic 2 completed | 9 | 0.56 | 5 | 0.73 | - | - | - | - | 2 | 0.43 | 8 | 1.22 |
| Technic 3 completed | 3 | 0.19 | 2 | 0.29 | - | - | -- | - | 1 | | 4 | 0.61 |
| Technic 4 completed | 119 | 7.41 | 51 | 7.49 | 25 | 5.22 | 16 | 6.81 | 3 | | 5 | 0.76 |
| Technic 5 completed | 27 | 1.68 | 12 | 1.76 | 4 | 0.83 | 4 | 1.70 | 1 | | - | - |
| College diploma completed | 160 | 9.97 | 64 | 9.40 | 25 | 5.22 | 12 | 5.11 | 26 | | 39 | 5.95 |
| College degree incomplete | 46 | 2.87 | 13 | 1.91 | 1 | 0.21 | 1 | 0.43 | 3 | 0.65 | 9 | 1.37 |
| College degree completed | 5 | 0.31 | 1 | 0.15 | 1 | 0.21 | - | - | 31 | 6.45 | - | - |
| Second degree and above completed | - | - | - | - | - | - | 1 | 0.43 | 6 | 1.30 | - | - |
| Total | 1605 | | 681 | 100.00 | 479 | 100.00 | 235 | 100.00 | 465 | 100.00 | 655 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.2.3: Time taken to arrive to primary and secondary schools**

| Time to school (minutes) | Administration zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mekelle | | Southern | | N.Western | | Western | | eastern | | Central | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| < 3 km | 778 | 49.94 | 237 | 36.69 | 183 | 39.27 | 85 | 36.64 | 209 | 44.95 | 241 | 34.58 |
| 3-6 km | 670 | 43 | 342 | 52.94 | 240 | 51.50 | 119 | 51.29 | 215 | 46.24 | 356 | 51.07 |
| 6.1-9 km | 90 | 5.78 | 63 | 9.75 | 37 | 7.94 | 20 | 8.62 | 38 | 8.17 | 84 | 12.05 |
| 9.1-12 km | 14 | 0.90 | 4 | 0.62 | 4 | 0.86 | 7 | 3.01 | 3 | 0.64 | 16 | 2.30 |
| >12 km | 6 | 0.38 | - | - | 2 | 0.43 | 1 | 0.44 | - | - | - | |
| Total | 1558 | 100.00 | 646 | 100.00 | 466 | 100.00 | 232 | 100.00 | 465 | 100.00 | 697 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.2.4: Distribution of responses of households on time taken to the nearest mill (in minutes)**

| Time to nearest mill (minutes) | Administration zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mekelle | | southern | | N.Western | | Western | | eastern | | Central | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| < 3 km | 1,513 | 95.21 | 634 | 98 | 446 | 94.09 | 213 | 92.00 | 442 | 95.05 | 666 | 94.74 |
| 3-6 km | 71 | 4.47 | 13 | 2 | 27 | 5.70 | 18 | 7.78 | 23 | 4.95 | 37 | 5.26 |
| 6.1-9 km | 3 | 0.19 | - | | 1 | 0.21 | - | | - | | - | |
| 9.1-12 km | 2 | 0.13 | - | | - | | 1 | 0.32 | - | | - | |
| >120 km | - | | - | | - | | - | | - | | - | |
| Total | 1589 | 100.00 | 647 | 100.00 | 474 | 100.00 | 231 | 100.00 | 465 | 100.00 | 703 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.2.5: Distribution of responses of households on time taken to the nearest commercial bank or Micro Finance Institutions (in minutes)**

| Time to banks/MFI (minutes) | Administration zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mekelle | | Southern | | N.Western | | Western | | eastern | | Central | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| < 3 km | 1,502 | 94.88 | 620 | 95.85 | 435 | 92.16 | 222 | 95.69 | 436 | 93.56 | 645 | 91.89 |
| 3-6 km | 72 | 4.55 | 27 | 4.15 | 35 | 7.42 | 10 | 4.31 | 30 | 6.44 | 55 | 7.83 |
| 6.1-9 km | 6 | 0.38 | - | | 1 | 0.21 | - | - | - | - | 2 | 0.28 |
| 9.1-12 km | 1 | 0.06 | - | | - | | - | - | - | - | - | |
| >120 km | 2 | 0.13 | - | | 1 | 0.21 | - | | - | | - | |
| Total | 1,583 | 100.00 | 647 | 100.00 | 472 | 100.00 | 232 | 100.00 | 466 | 100.00 | 702 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.2.6: Distribution of households by migration**

| Migration | Administration zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mekelle | | Southern | | N. Western | | Western | | eastern | | Central | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Yes | 224 | 13.97 | 114 | 16.76 | 59 | 12.32 | 32 | 13.62 | 111 | 23.82 | 165 | 23.44 |
| No | 1,380 | 86.03 | 566 | 83.24 | 420 | 87.68 | 203 | 86.38 | 355 | 76.12 | 539 | 76.56 |
| Total | 1,604 | 100.00 | 680 | 100.00 | 479 | 100.00 | 235 | 100.00 | 466 | 100.00 | 704 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.2.7: Distribution of migration by sex**

| Sex | Administration zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mekelle | | Southern | | N.Western | | Western | | Eastern | | Central | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Male | 119 | 52.42 | 70 | 60.34 | 39 | 66.10 | 16 | 55.17 | 68 | 61.26 | 100 | 59.52 |
| Female | 108 | 47.52 | 46 | 39.66 | 29 | 33.90 | 13 | 44.83 | 43 | 38.74 | 68 | 40.48 |
| Total | 227 | 100.00 | 116 | 100.00 | 53 | 100.00 | 29 | 100.00 | 111 | 100.00 | 168 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.2.8: Place of migration**

| Place of Migration | Administration zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mekelle | | Southern | | N.Western | | Western | | eastern | | Central | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Inside the region | 38 | 16.74 | 34 | 29.57 | 12 | 20.34 | 7 | 23.33 | 26 | 23.42 | 54 | 31.95 |
| Outside the region | 82 | 36.12 | 46 | 40 | 11 | 18.64 | 10 | 33.33 | 43 | 38.74 | 65 | 38.46 |
| Outside the country | 107 | 47.14 | 35 | 30.43 | 36 | 61.02 | 13 | 43.33 | 42 | 37.84 | 50 | 29.59 |
| Total | 227 | 100.00 | 115 | 100.00 | 59 | 100.00 | 30 | 100.00 | 111 | 100.00 | 169 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.2.9: Reason for migration**

| Reason for Migration | Administration zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mekelle | | Southern | | N.Western | | Western | | eastern | | Central | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Unable to find work | 76 | 33.93 | 45 | 40.54 | 28 | 47.46 | 13 | 40.63 | 49 | 44.55 | 66 | 39.52 |
| Better life | 95 | 42.41 | 37 | 33.33 | 12 | 20.34 | 7 | 21.88 | 46 | 41.82 | 79 | 47.31 |
| Forced by parents/Friends | 3 | 1.34 | 2 | 1.80 | 2 | 3.39 | 1 | 3.13 | 4 | 3.64 | 1 | 97.43 |
| Wrong information | 1 | 0.45 | 2 | 1.80 | - | - | - | - | - | - | 1 | 0.60 |
| To pay debt | - | - | 1 | 0.90 | 1 | 1.69 | - | - | - | - | - | - |
| Other | 49 | 21.88 | 24 | 21.62 | 16 | 27.12 | 11 | 34.38 | 11 | 10.00 | 20 | 11.98 |
| Total | 224 | 100.00 | 111 | 100.00 | 59 | 100.00 | 32 | 100.00 | 110 | 100.00 | 167 | 100.00 |

# Appendices at zonal level (Rural)

### 3.1. Demographic Characteristics

**Appendix Table 3.1.7: Marital status of household heads by administrative zones** (infant towns)

| Marital status | central | | Eastern | | North Western | | Southern | | South Eastern | | Western | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Male | Female | Male | Female | Male | female | male | female | male | female | male | Female |
| | % | % | % | % | % | % | % | % | % | % | % | % |
| Single | 3.65 | 5.48 | 5.60 | 5.29 | 1.80 | 2.30 | 2.83 | 3.90 | - | 2.94 | 1.90 | 1.45 |
| Married | 90.41 | 12.33 | 89.20 | 18.75 | 96.40 | 22.99 | 92.45 | 5.19 | 96.55 | 5.88 | 93.81 | 14.49 |
| Widowed | 0.91 | 32.88 | 0.80 | 29.81 | 0.90 | 22.99 | 1.89 | 32.47 | 3.45 | 32.35 | 0.95 | 26.09 |
| Divorced | 3.20 | 31.51 | 3.20 | 33.17 | 0.45 | 36.78 | 2.83 | 44.16 | - | 47.06 | 2.86 | 47.83 |
| Separated | 1.83 | 17.81 | 1.20 | 12.98 | 0.45 | 14.94 | - | 14.29 | - | 11.76 | 0.48 | 10.14 |
| Under age | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.1.8: Marital status of household heads in infant towns by administrative zones** (Pure rural)

| Marital status | Central | | Eastern | | North Western | | Southern | | South Eastern | | Western | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Male | Female | Male | Female | Male | female | male | female | male | female | male | Female |
| | % | % | % | % | % | % | % | % | % | % | % | % |
| Single | 1.22 | 3.27 | 0.86 | 3.24 | 1.56 | 0.73 | 0.76 | 2.69 | 1.67 | 3.98 | 1.90 | 1.08 |
| Married | 95.28 | 11.21 | 95.82 | 14.21 | 95.76 | 14.55 | 96.22 | 7.07 | 95.00 | 4.98 | 95.39 | 20.13 |
| Widowed | 2.22 | 47.43 | 1.35 | 43.64 | 1.34 | 39.27 | 1.51 | 34.01 | 2.50 | 45.77 | 0.81 | 29.03 |
| Divorced | 1.14 | 30.61 | 1.23 | 28.18 | 0.89 | 37.27 | 1.51 | 49.49 | 0.83 | 39.30 | 1.63 | 45.16 |
| Separated | 0.07 | 7.48 | 0.74 | 10.72 | 0.45 | 7.64 | - | 6.73 | 0.83 | 5.97 | 0.27 | 4.30 |
| Under age | 0.07 | - | - | - | - | - | - | - | - | - | - | - |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.1.9: Ethnicity of the surveyed households by administrative zones (infant town)**

| Ethnicity | Central | Eastern | North Western | Southern | South Eastern | Western |
|---|---|---|---|---|---|---|
| | % | % | % | % | % | % |
| Tigraway | 100.00 | 92.36 | 96.44 | 97.27 | 98.91 | 94.27 |
| Amhara | -- | -- | 2.59 | 2.73 | 1.09 | 5.02 |
| Kunama | -- | -- | -- | -- | -- | -- |
| Erob | -- | 7.42 | -- | -- | -- | -- |
| Agew | -- | -- | -- | -- | -- | 0.72 |
| Afar | -- | 0.22 | -- | -- | -- | -- |
| Oromo | -- | -- | -- | -- | -- | -- |
| Other | -- | -- | 0.32 | - | -- | -- |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.1.10: Ethnicity of the surveyed households by administrative zones (Pure rural)**

| Ethnicity | Central | Eastern | North Western | Southern | South Eastern | Western |
|---|---|---|---|---|---|---|
| | % | % | % | % | % | % |
| Tigraway | 99.95 | 88.30 | 98.96 | 98.07 | 100.00 | 95.02 |
| Amhara | 0.05 | -- | 0.51 | 0.64 | -- | 4.55 |
| Kunama | -- | -- | 0.34 | -- | -- | |
| Erob | -- | 11.70 | -- | -- | -- | 0.22 |
| Agew | -- | -- | -- | 1.10 | -- | |
| Afar | -- | -- | -- | -- | -- | |
| Oromo | -- | -- | 0.17 | -- | -- | |
| Other | -- | -- | 98.96 | -- | -- | |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.1.8: Distribution of households by religion (infant town)**

| Ethnicity | Central | Eastern | North Western | Southern | South Eastern | Western |
|---|---|---|---|---|---|---|
| | % | % | % | % | % | % |
| Orthodox | 92.60 | 90.39 | 96.12 | 97.81 | 97.83 | 96.77 |
| Catholic | -- | 6.33 | -- | -- | -- | -- |
| Protestant | -- | -- | -- | -- | -- | -- |
| Other Christian sects | -- | -- | -- | -- | -- | -- |
| Muslim | 7.40 | 3.28 | 3.88 | 2.19 | 2.19 | 3.23 |
| Other | -- | -- | -- | -- | -- | -- |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.1.11: Distribution of households by religion (pure rural)**

| Ethnicity | Central | Eastern | North Western | Southern | South Eastern | Western |
|---|---|---|---|---|---|---|
| | % | % | % | % | % | % |
| Orthodox | 99.18 | 87.31 | 98.04 | 89.63 | 99.52 | 96.75 |
| Catholic | 0.05 | 10.71 | -- | 0.09 | -- | -- |
| Protestant | -- | -- | -- | -- | -- | -- |
| Other Christian sects | -- | -- | -- | -- | -- | -- |
| Muslim | 0.77 | 1.95 | 1.96 | 10.28 | 0.88 | 3.25 |
| Other | -- | -- | -- | -- | -- | -- |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix 3.1.12: Distribution of household by source of income (infant towns)**

| No | Source of Income | Administrative Zone | | | | | |
|---|---|---|---|---|---|---|---|
| | | central | Eastern | North Western | Southern | South Eastern | Western |
| | | % | % | % | % | % | % |
| 1 | Private business employer | 3.29 | 1.97 | 0.97 | 2.73 | 1.09 | 0.36 |
| 2 | Private business owner | 20.55 | 15.28 | 7.44 | 19.13 | 9.78 | 10.39 |
| 3 | Female family business owner | 7.67 | 9.61 | 1.94 | 4.37 | 5.43 | 2.51 |
| 4 | Civil servant | 14.52 | 9.17 | 4.21 | 5.46 | 10.87 | 4.30 |
| 5 | Public inst. Worker | 0.82 | 0.87 | -- | -- | -- | 0.72 |
| 6 | Private business employee | 1.64 | 2.40 | 0.65 | 1.09 | 4.35 | 2.87 |
| 7 | NGO employee/Shareholder | -- | -- | -- | -- | -- | -- |
| 8 | Cooperative employee | -- | -- | -- | -- | -- | -- |
| 9 | Cooperative member | -- | -- | 0.65 | 0.55 | -- | -- |
| 10 | Daily laborer | 8.49 | 8.52 | 5.18 | 3.28 | 2.17 | 5.02 |
| 11 | House maid | -- | -- | 0.32 | 0.55 | -- | - |
| 12 | Farming/livestock production | 29.04 | 32.75 | 68.93 | 56..83 | 56.82 | 68.82 |
| 13 | Pensioner | 3.56 | 1.75 | 0.97 | 0.55 | 2.17 | -- |
| 14 | Unemployed but want to work | 1.37 | 2.18 | 0.32 | 1.09 | 1.09 | 0.36 |
| 15 | Unemployed and don't want to work | 0.55 | 1.31 | -- | -- | -- | 0.72 |
| 16 | Disabled but can work | 0.55 | 1.09 | 0.97 | -- | -- | 0.36 |
| 17 | Student | -- | -- | -- | -- | -- | -- |
| 18 | House wife | 4.66 | 10.26 | 4.21 | 3.83 | 4.35 | 1.79 |
| 19 | Unpaid family worker | 0.27 | -- | -- | -- | -- | -- |
| 20 | Underage helping in household chores | -- | -- | -- | -- | -- | -- |
| 21 | Underage/unable to work | -- | -- | -- | -- | -- | -- |
| 22 | Other | 3.01 | 2.84 | 4.24 | 0.55 | 2.17 | 1.79 |
| total | Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix 3.1.13: Distribution of household by source of income (Pure rural)**

| No | Source of Income | Administrative Zone | | | | | |
|---|---|---|---|---|---|---|---|
| | | central | Eastern | North Western | Southern | South Eastern | Western |
| | | % | % | % | % | % | % |
| 1 | Private business employer | 0.11 | 0.33 | 0.68 | 0.37 | 0.59 | 0.87 |
| 2 | Private business owner | 1.86 | 2.06 | 5.03 | 3.12 | 5.58 | 6.28 |
| 3 | Female family business owner | 0.82 | 1.65 | 1.28 | 1.19 | 2.20 | 1.52 |
| 4 | Civil servant | 1.53 | 0.91 | 2.82 | 1.01 | 0.73 | 3.68 |
| 5 | Public inst. Worker | -- | -- | 0.26 | 0.09 | -- | -- |
| 6 | Private business employee | 0.11 | 0.25 | 0.34 | 0.55 | 0.59 | 0.87 |
| 7 | NGO employee/Shareholder | -- | -- | -- | -- | -- | -- |
| 8 | Cooperative employee | -- | -- | -- | -- | -- | -- |
| 9 | Cooperative member | 0.05 | 5.19 | 0.17 | 0.09 | -- | -- |
| 10 | Daily laborer | 3.83 | 0.08 | 3.41 | 2.48 | 4.11 | 4.11 |
| 11 | House maid | 0.16 | -- | 0.17 | 0.28 | -- | 0.22 |
| 12 | Farming/livestock production | 86.31 | 79.98 | 81.23 | 86.51 | 81.50 | 74.03 |
| 13 | Pensioner | 0.11 | 0.25 | 0.77 | 0.28 | 0.15 | 1.52 |
| 14 | Unemployed but want to work | 0.16 | 0.49 | 0.17 | 0.18 | 0.15 | 0.87 |
| 15 | Unemployed and don't want to work | 0.38 | 0.49 | 0.09 | -- | -- | -- |
| 16 | Disabled but can work | 0.88 | 0.58 | 0.43 | 0.46 | 0.29 | 0.22 |
| 17 | Student | 0.05 | 0.08 | 0.09 | 0.09 | -- | 0.65 |
| 18 | House wife | 2.42 | 5.52 | 1.62 | 2.39 | 2.79 | 1.52 |
| 19 | Unpaid family worker | 0.49 | 0.16 | 0.26 | 0.09 | 0.29 | 0.43 |
| 20 | Underage helping in household chores | -- | -- | -- | -- | -- | -- |
| 21 | Underage/unable to work | -- | -- | -- | -- | -- | -- |
| 22 | Other | 0.71 | 1.98 | 1.19 | 0.73 | 1.03 | 3.25 |
| total | Total | 100.00 | 100.00 | 100.00 | 100.00 | | 100.00 |

(Socio-economic baseline survey, 2018)

## 3.2. Education

**Appendix Table 3.2.14: Distribution of responses of surveyed households on educational status by administration zone(infant towns)**

| Educational status | Administrative Zones | | | | | |
|---|---|---|---|---|---|---|
| | Central | Eastern | North Western | Southern | South Eastern | Western |
| | % | % | % | % | % | % |
| Currently in school | 1.64 | 2.18 | 0.97 | 7.65 | 9.78 | 2.51 |
| Previously in school | 65.48 | 61.79 | 48.22 | 43.13 | 45.65 | 52.69 |
| Not educated | 32.88 | 36.03 | 50.81 | 49.18 | 44.57 | 44.80 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.2.14: Distribution of responses of surveyed households on educational status by administration zone(pure rural)**

| Educational status | Administrative Zones | | | | | |
|---|---|---|---|---|---|---|
| | Central | Eastern | North Western | Southern | South Eastern | Western |
| | % | % | % | % | % | % |
| Currently in school | 1.53 | 1.24 | 1.45 | 4.13 | 4.26 | 1.08 |
| Previously in school | 44.91 | 39.60 | 44.71 | 32.60 | 34.87 | 47.84 |
| Not educated | 53.56 | 59.16 | 53.84 | 63.27 | 61.67 | 51.08 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.2.15: Distribution of households by reasons for drop out from school(infant town)**

| Reason for drop out from school | Administrative Zones | | | | | |
|---|---|---|---|---|---|---|
| | Central | Eastern | North Western | Southern | South Eastern | Western |
| | % | % | % | % | % | % |
| Busy with HOUSEHOLD chores | -- | -- | 63.69 | 63.33 | 73.17 | 50.41 |
| Unable to pay school fee | 46.34 | 56.82 | 8.92 | 3.33 | -- | 15.45 |
| Sickness | 4.88 | 2.27 | 1.27 | -- | | -- |
| School is far | 46.34 | 40.91 | 10.19 | 10.00 | 4.88 | 13.01 |
| Education is useless | -- | -- | 1.27 | 24.44 | 4.88 | 2.44 |
| Don’t want to be employed | 2.44 | -- | -- | 2.22 | 2.44 | 0.81 |
| Other | -- | -- | 14.65 | 16.67 | 14.63 | 17.89 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.2.16: Distribution of households by reasons for educational drop out (Pure rural)**

| Reason for drop out | Administrative Zones | | | | | |
|---|---|---|---|---|---|---|
| | central | Eastern | North Western | Southern | South Eastern | Western |
| | % | % | % | % | % | % |
| Busy with HOUSEHOLD chores | 0.58 | -- | 69.95 | 66.04 | 70.95 | 67.23 |
| Unable to pay school fee | 46.65 | 49.44 | 8.90 | 4.06 | 4.52 | 10.64 |
| Sickness | 3.21 | 3.33 | 1.43 | 1.16 | 0.71 | 1.70 |
| School is far | 45.48 | 42.78 | 8.59 | 15.24 | 10.48 | 9.36 |
| Education is useless | 1.46 | 1.67 | 1.75 | 4.06 | 6.43 | 1.28 |
| Don't want to be employed | 1.17 | 1.11 | 0.32 | 1.60 | 1.67 | 0.43 |
| Other | 1.46 | 1.67 | 9.06 | 7.84 | 5.24 | 9.36 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.2.18: Distribution of households by attendance of adult education by administrative zones (infant towns).**

| Reason for drop out | Administrative Zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | North Western | | Southern | | South Eastern | | Western | |
| | Male | Female | Male | Female | Male | Female | Male | Female | Male | female | Male | Female |
| | % | % | % | % | % | % | % | % | % | % | % | % |
| Yes | 8.22 | 9.59 | 15.60 | 10.10 | 21.05 | -- | 20.75 | 19.48 | 10.34 | 14.71 | 14.29 | -- |
| No | 91.78 | 90.41 | 84.40 | 89.90 | 78.95 | 100.00 | 79.25 | 80.52 | 89.66 | 85.29 | 85.71 | 100.00 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.2.19: Distribution of households by attendance of adult education by administrative zones (pure rural)**

| Reason for drop out | Administrative Zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | North Western | | Southern | | South Eastern | | Western | |
| | Male | Female | Male | Female | Male | Female | Male | Female | Male | female | Male | Female |
| | % | % | % | % | % | % | % | % | % | % | % | % |
| Yes | 9.94 | 3.74 | 11.58 | 5.50 | 16.67 | -- | 20.93 | 9.12 | 18.54 | 3.98 | 20.69 | -- |
| No | 90.06 | 96.26 | 88.42 | 94.50 | 83.33 | 100.00 | 79.07 | 90.88 | 81.46 | 96.02 | 79.31 | 100 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.2.19: Distribution of households by ability to read by administrative zones (infant towns)**

| Able to read | Administrative Zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | North Western | | Southern | | South Eastern | | Western | |
| | Male | Female | Male | Female | Male | Female | Male | Female | Male | female | Male | Female |
| | % | % | % | % | % | % | % | % | % | % | % | % |
| Yes | 79.00 | 48.63 | 76.80 | 51.44 | 61.71 | 28.74 | 63.21 | 41.56 | 70.69 | 32.35 | 65.24 | 33.33 |
| No | 21.00 | 51.37 | 23.29 | 48.56 | 38.29 | 71.26 | 36.79 | 58.44 | 29.31 | 67.65 | 34.76 | 66.67 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.2.19: Distribution of households by ability to read by administrative zones (pure rural)**

| Able to read | Administrative Zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | North Western | | Southern | | South Eastern | | Western | |
| | Male | Female | Male | Female | Male | Female | Male | Female | Male | female | Male | Female |
| | % | % | % | % | % | % | % | % | % | % | % | % |
| Yes | 56.94 | 16.36 | 53.69 | 22.50 | 56.52 | 20.73 | 50.69 | 15.54 | 48.33 | 19.90 | 57.45 | 32.26 |
| No | 43.06 | 83.64 | 46.31 | 77.50 | 43.48 | 79.27 | 49.31 | 84.46 | 51.67 | 80.10 | 42.55 | 67.74 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.2.19: Distribution of households by ability to write by administrative zones (infant towns)**

| Able to write | Administrative Zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | North Western | | Southern | | South Eastern | | Western | |
| | Male | Female | Male | Female | Male | Female | Male | Female | Male | female | Male | Female |
| | % | % | % | % | % | % | % | % | % | % | % | % |
| Yes | 79.45 | 50.00 | 76.00 | 50.96 | 60.81 | 27.59 | 63.21 | 40.26 | 70.69 | 32.35 | 65.24 | 33.33 |
| No | 20.55 | 50.00 | 24.00 | 49.04 | 39.19 | 72.41 | 36.79 | 59.74 | 29.31 | 67.65 | 34.76 | 66.67 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.2.19: Distribution of households by ability to write by administrative zones (pure rural)**

| Able to write | Administrative Zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | North Western | | Southern | | South Eastern | | Western | |
| | Male | Female | Male | Female | Male | Female | Male | Female | Male | female | Male | Female |
| | % | % | % | % | % | % | % | % | % | % | % | % |
| Yes | 56.44 | 15.89 | 52.71 | 22.50 | 56.08 | 20.36 | 49.94 | 15.88 | 47.27 | 18.09 | 56.91 | 31.18 |
| No | 43.56 | 84.11 | 47.29 | 77.50 | 43.92 | 79.04 | 50.06 | 84.12 | 52.71 | 56.91 | 43.09 | 68.82 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.2.19: Distribution of households by level of education by administrative zones (infant towns)**

| Level of education | Administrative Zones | | | | | |
|---|---|---|---|---|---|---|
| | Central | Eastern | North Western | Southern | South Eastern | Western |
| | % | % | % | % | % | % |
| Illiterate | -- | 0.68 | 50.81 | -- | -- | 44.80 |
| Elder/adult education | 1.22 | 3.75 | 1.29 | 3.23 | 5.88 | 1.08 |
| Religious | 3.67 | 3.75 | 5.18 | 6.45 | 5.88 | 1.79 |
| Not finished primary | 30.20 | 26.96 | 19.42 | 31.18 | 27.45 | 27.60 |
| Finished primary | 10.61 | 13.31 | 4.85 | 11.83 | 9.80 | 6.45 |
| Grade seven completed | 4.90 | 6.14 | 4.21 | 9.68 | 5.88 | 3.58 |
| Eighth grade completed | 11.02 | 9.56 | 3.24 | 7.53 | 7.84 | 5.38 |
| Nine grade competed | 2.45 | 5.12 | 0.97 | 5.38 | 1.96 | 1.43 |
| Tenth grade completed | 15.51 | 14.68 | 6.47 | 10.75 | 13.73 | 3.23 |
| Eleventh grade completed | 0.82 | 0.68 | -- | 2.15 | -- | 1.08 |
| Twelfth grade completed | 2.45 | 2.39 | 0.65 | 1.08 | 3.92 | 0.72 |
| TTI completed | -- | -- | -- | -- | -- | -- |
| Technic 1 completed | -- | -- | -- | -- | -- | -- |
| Technic 2 completed | -- | -- | 0.32 | 1.08 | -- | -- |
| Technic 3 completed | -- | 0.68 | -- | -- | 1.96 | -- |
| Technic 4 completed | 0.82 | -- | -- | -- | -- | -- |
| Technic 5 completed | -- | -- | -- | -- | -- | -- |
| College diploma completed | 8.16 | 3.41 | 1.29 | 4.30 | 7.84 | 1.79 |
| College degree incomplete | 2.45 | 2.73 | 0.32 | -- | -- | -- |
| College degree completed | 5.31 | 5.80 | 0.97 | 5.38 | 5.88 | 1.08 |
| Second degree and above completed | 0.41 | 0.34 | -- | -- | 1.96 | -- |
| other | -- | -- | -- | -- | -- | -- |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.2.19: Distribution of households by level of education by administrative zones (pure rural)**

| Level of education | Administrative Zones | | | | | |
|---|---|---|---|---|---|---|
| | Central | Eastern | North Western | Southern | South Eastern | Western |
| | % | % | % | % | % | % |
| Illiterate | 0.83 | 0.81 | 53.80 | 0.25 | -- | 50.98 |
| Elder/adult education | 2.95 | 2.22 | 1.11 | 5.25 | 6.13 | 0.87 |
| Religious | 19.10 | 16.77 | 5.55 | 16.25 | 23.37 | 4.79 |
| Not finished primary | 37.62 | 36.16 | 22.63 | 35.75 | 29.89 | 20.92 |
| Finished primary | 12.26 | 11.72 | 3.67 | 11.00 | 10.73 | 4.79 |
| Grade seven completed | 4.25 | 6.06 | 2.31 | 5.50 | 5.75 | 2.61 |
| Eighth grade completed | 5.54 | 8.89 | 2.65 | 8.00 | 8.05 | 3.92 |
| Nine grade competed | 4.25 | 5.05 | 1.79 | 4.00 | 1.92 | 1.74 |
| Tenth grade completed | 9.20 | 7.68 | 3.67 | 9.75 | 10.34 | 4.79 |
| Eleventh grade completed | 0.47 | 1.01 | 0.34 | 0.25 | -- | 0.44 |
| Twelfth grade completed | 0.24 | 1.21 | 0.34 | 2.00 | 0.38 | 0.44 |
| TTI completed | -- | -- | 0.34 | -- | -- | -- |
| Technic 1 completed | 0.47 | 0.20 | 0.09 | -- | -- | -- |
| Technic 2 completed | 0.35 | 0.20 | 0.09 | 0.25 | -- | -- |
| Technic 3 completed | -- | 0.20 | -- | 0.25 | 0.77 | |
| Technic 4 completed | -- | -- | 0.09 | 0.25 | -- | 0.65 |
| Technic 5 completed | -- | -- | -- | -- | -- | -- |
| College diploma completed | 1.18 | 0.61 | 0.60 | 0.25 | 1.53 | 1.31 |
| College degree incomplete | 0.35 | 0.20 | 0.26 | -- | 0.38 | -- |
| College degree completed | 0.83 | 0.61 | 0.77 | 0.75 | 0.77 | 1.09 |
| Second degree and above completed | -- | -- | 0.09 | -- | -- | 0.22 |
| other | 0.12 | 0.40 | 0.17 | 0.25 | -- | 0.44 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.2.20: Time taken to arrive to primary school by administrative zone (infant town)**

| Distance to school to primary school | Administrative Zone | | | | | |
|---|---|---|---|---|---|---|
| | Central | Eastern | North Western | Southern | South Eastern | Western |
| | % | % | % | % | % | % |
| < 3 km | 21.62 | 88.00 | 62.32 | 88.00 | 100.00 | -- |
| 3-6 km | 5.41 | 12.00 | 28.98 | 12.00 | -- | 61.90 |
| 6.1-9 km | 4.05 | -- | 4.35 | -- | -- | 28.58 |
| 9.1-12 km | 1.35 | -- | 4.35 | -- | -- | 4.76 |
| >12 km | -- | -- | -- | -- | -- | 4.76 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.2.21: Time taken to arrive to primary school by administrative zone (pure rural)**

| Distance to primary school | Administrative Zone | | | | | |
|---|---|---|---|---|---|---|
| | Central | Eastern | North Western | Southern | South Eastern | Western |
| | % | % | % | % | % | % |
| < 3 km | 62.27 | 64.67 | 69.30 | 76.34 | 84.33 | |
| 3-6 km | 29.84 | 22.86 | 25.83 | 17.56 | 12.69 | |
| 6.1-9 km | 4.45 | 7.62 | 2.13 | 2.51 | 0.75 | |
| 9.1-12 km | 3.44 | 4.16 | 1.52 | 2.87 | 0.74 | |
| >12 km | -- | 0.69 | 1.22 | 0.72 | 1.49 | |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.2.20: Time taken to arrive to secondary school by administrative zone (infant town)**

| Distance to school to secondary school | Administrative Zone | | | | | |
|---|---|---|---|---|---|---|
| | Central | Eastern | North Western | Southern | South Eastern | Western |
| | % | % | % | % | % | % |
| < 3 km | 71.03 | 70.97 | 17.59 | 60.81 | 37.25 | 32.91 |
| 3-6 km | 15.89 | 11.29 | 13.06 | 13.51 | 1.96 | 24.68 |
| 6.1-9 km | 7.48 | 5.65 | 11.06 | 5.41 | 13.73 | 8.86 |
| 9.1-12 km | 2.80 | 8.06 | 21.10 | 2.70 | 27.45 | 18.82 |
| >12 km | 2.80 | 4.03 | 37.19 | 17.57 | 19.61 | 17.72 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.2.21: Time taken to arrive to secondary school by administrative zone (pure rural)**

| Distance to secondary school | Administrative Zone | | | | | |
|---|---|---|---|---|---|---|
| | Central | Eastern | North Western | Southern | South Eastern | Western |
| | % | % | % | % | % | % |
| < 3 km | 7.37 | 14.19 | 11.38 | 16.31 | 9.22 | 16.62 |
| 3-6 km | 19.37 | 21.06 | 18.08 | 26.53 | 21.37 | 15.38 |
| 6.1-9 km | 12.53 | 15.43 | 10.94 | 13.08 | 13.53 | 11.69 |
| 9.1-12 km | 24.66 | 20.83 | 18.30 | 24.28 | 24.12 | 24.62 |
| >12 km | 36.06 | 28.49 | 41.29 | 19.80 | 31.76 | 31.69 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.2.22: Time taken to arrive to nearest Mill by administrative zone (infant town)**

| Distance to Mill | Administrative Zone | | | | | |
|---|---|---|---|---|---|---|
| | Central | Eastern | North Western | Southern | South Eastern | Western |
| | % | % | % | % | % | % |
| < 3 km | 44.83 | 68 | 37.5 | 64.71 | 100.00 | 56.00 |
| 3-6 km | 31.04 | 16 | 33.33 | 17.65 | -- | 24.00 |
| 6.1-9 km | 10.34 | 8 | 9.38 | 11.76 | -- | 12.00 |
| 9.1-12 km | 10.34 | 8 | 7.29 | -- | -- | 4.00 |
| >12 km | 3.45 | -- | 12.5 | 5.88 | -- | 4.00 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

(Socio-economic baseline survey, 2018)

**Appendix Table 3.2.23: Time taken to arrive to nearest Mill by administrative zone (pure rural)**

| Distance to Mill | Administrative Zone | | | | | |
|---|---|---|---|---|---|---|
| | Central | Eastern | North Western | Southern | South Eastern | Western |
| | % | % | % | % | % | % |
| < 3 km | 34.34 | 44.23 | 32.69 | 54.12 | 45.00 | 64.77 |
| 3-6 km | 27.64 | 34.59 | 33.41 | 27.06 | 22.08 | 21.59 |
| 6.1-9 km | 10.76 | 19.59 | 15.74 | 7.35 | 9.17 | 6.82 |
| 9.1-12 km | 14.65 | 19.59 | 18.16 | 7.65 | 10.00 | 4.55 |
| >12 km | 12.61 | -- | -- | 3.82 | 13.75 | 2.27 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

(Socio-economic baseline survey, 2018)

Appendix Table 3.3.1. Distribution of response of households on ownerships of farmland by administrative zones

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=2191) | Eastern (N=1674) | Southern (N=1273) | South E (N=775) | Western (N=741) | North W (N=1481) |
| 1 | Yes | 73.4 | 67.6 | 83.7 | 85.4 | 67.1 | 75.7 |
| 2 | No | 26.6 | 32.4 | 16.3 | 14.6 | 32.9 | 24.3 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.2. Distribution households by size of farmland by administrative zones

| No. | Land size | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=1609) | Eastern (N=1132) | Southern (N=1043) | South E (N=645) | Western (N=493) | North W (N=1112) |
| 1 | 0-0.255 | 2.4 | 3.4 | 3.9 | 2.0 | 0.8 | 1.6 |
| 2 | 0.255-0.504 | 12.1 | 17.7 | 10.5 | 11.0 | 3.0 | 3.8 |
| 3 | 0.505-1.004 | 36.7 | 45.8 | 44.1 | 39.4 | 8.9 | 16.5 |
| 4 | 1.005-2.004 | 32.9 | 25.1 | 24.8 | 34.3 | 15.6 | 31.7 |
| 5 | 2.005-4.004 | 15.1 | 7.2 | 11.5 | 11.9 | 22.3 | 30.1 |
| 6 | 4.005-6.004 | 0.7 | 0.7 | 2.7 | 0.5 | 9.7 | 8.4 |
| 7 | 6.005-10.004 | 0.2 | 0.1 | 1.5 | 0.5 | 22.7 | 4.9 |
| 8 | >10.005 | 0.0 | 0.0 | 1.0 | 0.5 | 16.8 | 3.0 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.3. Distribution of size of land the households rented-in in 2017/18

| No. | Land size | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=320) | Eastern (N=143) | Southern (N=306) | South E (N=141) | Western (N=230) | North W (N=449) |
| 1 | 0-0.255 | 30.0 | 54.5 | 37.3 | 26.2 | 4.8 | 5.8 |
| 2 | 0.255-0.504 | 35.3 | 25.2 | 32.7 | 41.8 | 11.7 | 23.4 |
| 3 | 0.505-1.004 | 25.6 | 14.0 | 20.6 | 22.0 | 18.3 | 39.6 |
| 4 | 1.005-2.004 | 8.1 | 3.5 | 7.8 | 9.9 | 33.9 | 24.5 |
| 5 | 2.005-4.004 | 0.6 | 2.1 | 1.6 | | 25.2 | 6.5 |
| 6 | 4.005-6.004 | 0.3 | 0.7 | | | 3.0 | 0.2 |
| 7 | 6.005-10.004 | | | | | 1.7 | |
| 8 | >10.005 | | | | | 1.3 | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.4. Response of households on reason for renting-in land

| No. | Reason | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=320) | Eastern (N=143) | Southern (N=306) | South E (N=142) | Western (N=232) | North W (N=450) |
| 1 | Farm is close to residence | 38.1 | 41.3 | 30.4 | 18.3 | 26.3 | 31.1 |
| 2 | No/Shortage of land | 38.1 | 35.0 | 43.5 | 40.8 | 49.1 | 44.2 |
| 3 | Farm is fertile | 3.1 | 4.2 | 4.6 | 4.9 | 5.2 | 3.8 |
| | Farm can be irrigated | 0.6 | 0.7 | 0.3 | 0.0 | 0.0 | 0.0 |
| | Farm is accessible to transport/market | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 0.4 |
| | Increased profitability by cultivating more land | 12.5 | 10.5 | 15.4 | 23.2 | 10.8 | 8.7 |
| 4 | Have extra labour | 0.6 | 0.0 | 0.3 | 1.4 | 0.4 | 1.1 |
| 5 | Have extra seeds/oxen | 0.6 | 0.0 | 0.7 | 0.7 | 0.0 | 0.7 |
| 6 | Shortage of land to satisfy own demand | 3.4 | 3.5 | 4.6 | 8.5 | 6.0 | 9.3 |
| 7 | To help owner of the land | 0.9 | 1.4 | 0.0 | 0.7 | 0.4 | 0.0 |
| 8 | Others | 1.9 | 3.5 | 0.3 | 1.4 | 1.3 | 0.7 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.5. Distribution of size of land the households rented-out in 2017/18

| No. | Land size | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=190) | Eastern (N=148) | Southern (N=183) | South E (N=125) | Western (N=93) | North W (N=220) |
| 1 | 0-0.255 | 46.3 | 49.3 | 38.3 | 50.4 | 16.1 | 17.3 |
| 2 | 0.255-0.504 | 31.6 | 35.8 | 23.5 | 28.8 | 11.8 | 31.8 |
| 3 | 0.505-1.004 | 18.4 | 12.2 | 26.2 | 14.4 | 36.6 | 35.5 |
| 4 | 1.005-2.004 | 3.7 | 2.0 | 10.4 | 6.4 | 30.1 | 14.1 |
| 5 | 2.005-4.004 | | 0.7 | 1.6 | | 5.4 | 1.4 |
| 6 | 4.005-6.004 | | | | | | |
| 7 | 6.005-10.004 | | | | | | |
| 8 | >10.005 | | | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.6. Response of households on reason for renting-out land

| No. | Reason | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=190) | Eastern (N=148) | Southern (N=195) | South E (N=129) | Western (N=93) | North W (N=220) |
| 1 | Farm is far | 31.6 | 33.1 | 26.7 | 18.6 | 44.1 | 47.7 |
| 2 | Low soil fertility | 1.1 | 2.7 | 1.5 | 3.1 | 1.1 | 1.8 |
| 3 | Farming is not profitable | | 0.7 | 1.0 | 0.8 | 1.1 | 0.9 |
| 4 | In availability of inputs | 4.7 | 4.1 | 7.2 | 8.5 | 3.2 | 7.7 |
| 5 | Shortage of ox | 38.4 | 37.8 | 43.1 | 56.6 | 21.5 | 23.2 |
| 6 | Shortage of money | 4.7 | 2.0 | 3.1 | 2.3 | 5.4 | 3.6 |
| 7 | Shortage labour force | 13.2 | 16.2 | 5.6 | 6.2 | 8.6 | 11.4 |
| 8 | Others | 6.3 | 3.4 | 11.8 | 3.9 | 15.1 | 3.6 |
| | Total | 100.0 | 100.0 | 100.0 | | 100.0 | 100.0 |

Appendix Table 3.3.7. Distribution of amount of rent (money) obtained by households who have rented out land

| No. | Amount (Birr) | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=168) | Eastern (N=133) | Southern (N=175) | South E (N=122) | Western (N=64) | North W (N=113) |
| 1 | <100 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.9 |
| 2 | 101-500 | 9.5 | 12.8 | 3.4 | 9.0 | 7.8 | 23.9 |
| 3 | 501-1000 | 14.9 | 16.5 | 10.9 | 18.9 | 17.2 | 19.5 |
| 4 | 1001-5000 | 66.1 | 64.7 | 67.4 | 57.4 | 51.6 | 52.2 |
| 5 | 5001-10000 | 9.5 | 5.3 | 13.7 | 13.1 | 14.1 | 2.7 |
| 6 | >10001 | 0.0 | 0.8 | 4.6 | 1.6 | 9.4 | 0.9 |
| | Total | 100.0 | 100.0 | 100.0 | | 100.0 | 100.0 |

Appendix Table 3.3.8. Response of households on how married members get land

| No. | Means of getting land | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=189) | Eastern (N=148) | Southern (N=192) | South E (N=128) | Western (N=91) | North W (N=216) |
| 1 | Share the household land | 25.9 | 23.0 | 15.1 | 20.3 | 37.4 | 31.5 |
| 2 | The PA does provide | 8.5 | 16.2 | 18.8 | 5.5 | 26.4 | 16.2 |
| 3 | Inheritance | 13.2 | 14.2 | 10.4 | 8.6 | 6.6 | 7.4 |
| 4 | Others | 1.6 | 4.1 | 4.7 | 3.9 | 7.7 | 3.2 |
| 5 | 1 & 2 | 9.5 | 5.4 | 6.3 | 7.0 | 9.9 | 11.1 |
| 6 | 1 & 3 | 21.2 | 17.6 | 10.9 | 11.7 | 4.4 | 9.3 |
| 7 | 2 & 3 | 7.4 | 10.1 | 9.4 | 11.7 | 4.4 | 4.2 |
| 8 | 1, 2 & 3 | 12.7 | 9.5 | 24.5 | 31.3 | 3.3 | 17.1 |
| | Total | 100.0 | 100.0 | 100.0 | | 100.0 | 100.0 |

Appendix Table 3.3.9. Response of households on consolidation of land holding

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=1722) | Eastern (N=1189) | Southern (N=1138) | South E (N=687) | Western (N=573) | North W (N=1234) |
| 1 | Consolidated | 41.9 | 52.9 | 39.9 | 29.3 | 60.6 | 37.1 |
| 2 | Fragmented | 58.1 | 47.1 | 60.1 | 70.7 | 39.4 | 62.9 |
| | Total | 100.0 | 100.0 | 100.0 | | 100.0 | 100.0 |

Appendix Table 3.3.10. Response of households on reason for having fragmented farmlands

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=1007) | Eastern (N=564) | Southern (N=680) | South E (N=486) | Western (N=225) | North W (N=774) |
| 1 | Shortage of land | 22.8 | 25.5 | 21.9 | 11.9 | 34.7 | 24.7 |
| 2 | The PA does provide | 15.3 | 21.6 | 21.2 | 22.6 | 28.4 | 31.9 |
| 3 | Inheritance | 5.4 | 7.8 | 14.6 | 19.1 | 16.0 | 12.8 |
| 4 | Others | 38.7 | 27.0 | 7.9 | 9.3 | 7.6 | 13.8 |
| 5 | 1 & 2 | 13.0 | 15.1 | 18.1 | 18.5 | 4.0 | 7.5 |
| 6 | 1 & 3 | 4.0 | 2.0 | 6.6 | 6.6 | 4.4 | 4.1 |
| 7 | 2 & 3 | 0.0 | 0.0 | 7.1 | 9.3 | 3.6 | 4.7 |
| 8 | 1, 2 & 3 | 0.8 | 1.1 | 2.6 | 2.7 | 1.3 | 0.5 |
| | Total | 100.0 | 100.0 | 100.0 | | 100.0 | 100.0 |

Appendix Table 3.3.11. Response on households on whether fragmentation has problem on land holding by administrative zones

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=1009) | Eastern (N=564) | Southern (N=684) | South E (N=486) | Western (N=738) | North W (N=1481) |
| 1 | Yes | 83.3 | 81.2 | 68.3 | 69.5 | 26.6 | 45.0 |
| 2 | No | 16.7 | 18.8 | 31.7 | 30.5 | 73.4 | 55.0 |
| | Total | 100.0 | 100.0 | 100.0 | | 100.0 | 100.0 |

Appendix Table 3.3.12. Response of households on problems of land fragmentation by

| No. | Problems | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=836) | Eastern (N=454) | Southern (N=454) | South E (N=338) | Western (N=192) | North W (N=663) |
| 1 | Plots are far apart to look after | 54.1 | 55.5 | 67.8 | 69.8 | 83.3 | 75.1 |
| 2 | Plots are small | 0.8 | 0.9 | 2.4 | 3.0 | 1.6 | 0.6 |
| 3 | 1 & 2 | 45.1 | 43.4 | 28.4 | 26.6 | 15.1 | 24.3 |
| 4 | Others | 0 | 0.2 | 1.3 | 0.6 | 0 | 0.0 |
| | Total | 100.0 | 100.0 | 100.0 | | 100.0 | 100.0 |

Appendix Table 3.3.13. Response of households on advantages of land fragmentation by administrative zones

| No. | Advantages | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=780) | Eastern (N=106) | Southern (N=216) | South E (N=148) | Western (N=30) | North W (N=110) |
| 1 | Variety of soil fertility | 41.5 | 32.1 | 44.4 | 35.1 | 53.3 | 62.7 |
| 2 | Not to be affected by natural/ man-made disaster | 3.3 | 1.9 | 3.7 | 6.1 | 3.3 | 2.7 |
| 3 | Fairness of land distribution | 12.6 | 14.2 | 8.8 | 11.5 | 13.3 | 16.4 |
| 4 | 1 &2 | 7.3 | 11.3 | 6.5 | 4.7 | 3.3 | 0.9 |
| 5 | 1 & 3 | 17.4 | 18.9 | 24.5 | 26.4 | 3.3 | 8.2 |
| 6 | 2 & 3 | 1.7 | 2.8 | 0.5 | 1.4 | 0.0 | 0.9 |
| 7 | 1, 2 & 3 | 9.6 | 11.3 | 3.7 | 10.1 | 3.3 | 2.7 |
| 8 | Others | 6.5 | 7.5 | 7.9 | 4.7 | 20.0 | 5.5 |
| | Total | 100.0 | 100.0 | 100.0 | | 100.0 | 100.0 |

Appendix Table 3.3.14. Distribution of cultivated land (in ha)

| No. | Range of cultivated land (ha) | HOUSEHOLD | % |
|---|---|---|---|
| | Central | | |
| 1 | 0 | 607 | |
| 2 | <0.255 | 369 | 23.3 |
| 3 | 0.256-0.505 | 482 | 30.4 |
| 4 | 0.506-1.005 | 536 | 33.8 |
| 5 | 1.006-2.005 | 178 | 11.2 |
| 6 | 2.006-4.005 | 16 | 1.0 |
| 7 | 4.005-6.005 | 1 | 0.1 |
| 8 | 6.006-10.005 | | |
| 9 | >10.005 | 2 | 0.1 |
| | Total | 1584 | |
| | Eastern | | |
| 1 | 0 | 606 | |
| 2 | <0.255 | 404 | 37.9 |
| 3 | 0.256-0.505 | 358 | 33.6 |
| 4 | 0.506-1.005 | 240 | 22.5 |
| 5 | 1.006-2.005 | 47 | 4.4 |
| 6 | 2.006-4.005 | 8 | 0.7 |
| 7 | 4.005-6.005 | 3 | 0.3 |
| 8 | 6.006-10.005 | 3 | 0.3 |
| 9 | >10.005 | 4 | 0.4 |
| | Total | 1067 | |
| | Southern | | |
| 1 | 0 | 312 | |
| 2 | <0.255 | 227 | 23.6 |
| 3 | 0.256-0.505 | 287 | 29.9 |
| 4 | 0.506-1.005 | 288 | 30.0 |
| 5 | 1.006-2.005 | 123 | 12.8 |
| 6 | 2.006-4.005 | 33 | 3.4 |
| 7 | 4.005-6.005 | 1 | 0.1 |
| 8 | 6.006-10.005 | | |
| 9 | >10.005 | 2 | 0.2 |
| | Total | 961 | |
| | South Eastern | | |
| 1 | 0 | 185 | 15.3 |
| 2 | <0.255 | 90 | 27.5 |
| 3 | 0.256-0.505 | 162 | 33.1 |
| 4 | 0.506-1.005 | 195 | 21.7 |
| 5 | 1.006-2.005 | 128 | 2.2 |
| 6 | 2.006-4.005 | 13 | 0.2 |
| 7 | 4.005-6.005 | 1 | 0.2 |
| 8 | 6.006-10.005 | | |
| 9 | >10.005 | 1 | 0.2 |

| | | | |
|---|---|---|---|
| | Total | 590 | |
| | Western | | |
| 1 | 0 | 312 | 31.4 |
| 2 | <0.255 | 185 | 24.7 |
| 3 | 0.256-0.505 | 146 | 6.9 |
| 4 | 0.506-1.005 | 41 | 9.0 |
| 5 | 1.006-2.005 | 53 | 0.7 |
| 6 | 2.006-4.005 | 4 | |
| 7 | 4.005-6.005 | | |
| 8 | 6.006-10.005 | | |
| 9 | >10.005 | | |
| | Total | 429 | |
| | North Western | | |
| 1 | 0 | 443 | 44.6 |
| 2 | <0.255 | 263 | 59.7 |
| 3 | 0.256-0.505 | 352 | 48.1 |
| 4 | 0.506-1.005 | 284 | 19.3 |
| 5 | 1.006-2.005 | 114 | 4.2 |
| 6 | 2.006-4.005 | 25 | |
| 7 | 4.005-6.005 | | |
| 8 | 6.006-10.005 | | |
| 9 | >10.005 | | |
| | Total | 1038 | |

Appendix Table 3.3.15. Response of house holders for productivity of the crops they harvested

| **Crop type** | Productivity (qt $ha^{-1}$) within zones | | | |
|---|---|---|---|---|
| | Prod. (qt $ha^{-1}$) | No. of HOUSEHOLD | SD | Ranges |
| **Central Zone** | | | | |
| **Cereals** | | | | |
| Tef | 8.8 | 809 | 7.7 | 0.6-40 |
| Wheat | 8.2 | 75 | 6.4 | 0.5-24 |
| Barley | 8.2 | 51 | 6.9 | 1-32 |
| Kerkaeta | 9.3 | 15 | 6.6 | 2-24 |
| Sorghum | 11.0 | 341 | 11.0 | 0.8- |
| Lequa | 2.8 | 4 | 1.5 | 1-4 |
| Maize | 9.3 | 206 | 8.1 | 1-60 |
| Finger millet | 9.2 | 50 | 8.2 | 2-48 |
| **Pulses** | | | | |
| Faba bean | 7.5 | 4 | 5.3 | 2-12 |
| Pulses | 6 | 1 | | |
| Lentils | | | | |

| Crop type | Productivity (qt ha$^{-1}$) within zones | | | |
|---|---|---|---|---|
| | Prod. (qt ha$^{-1}$) | No. of HOUSEHOLD | SD | Ranges |
| **Oil crops** | | | | |
| Sesame | | | | |
| Linseed | 4 | 1 | | |
| Ground nut | 11.5 | 4 | 7.7 | 4-20 |
| **Vegetables** | | | | |
| Vegetables | 20.5 | 2 | 27.6 | 1-40 |
| **Root crops** | | | | |
| Potatoes | | | | |
| Onion | 33 | 2 | 38.2 | 6-60 |
| **Eastern Zone** | | | | |
| **Cereals** | | | | |
| Tef | 6.1 | 149 | 5.5 | 0.6-40 |
| Wheat | 8.4 | 372 | 6.6 | 0.5-56 |
| Barley | 7.4 | 394 | 5.3 | 0.5-32 |
| Kerkaeta | 8.5 | 30 | 6.1 | 2-24 |
| Sorghum | 8.5 | 23 | 4.8 | 1-16 |
| Lequa | 9.0 | 12 | 8.8 | 1.2-32 |
| Maize | 4.5 | 47 | 4.5 | 0.8-24 |
| Finger millet | 4.4 | 5 | 4.5 | 0.8-12 |
| **Pulses** | | | | |
| Faba bean | 3.3 | 3 | 1.2 | 2-4 |
| Pulses | 5.4 | 8 | 3.2 | 2-12 |
| Lentils | 2 | 6 | 1.1 | 0.8-4 |
| **Oil crops** | | | | |
| Sesame | | | | |
| Linseed | 2 | 2 | | |
| Ground nut | | | | |
| **Root crops** | | | | |
| Potatoes | 4 | 1 | | |
| Onion | 6 | 2 | 2.8 | 4-8 |
| **Southern Zone** | | | | |
| **Cereals** | | | | |
| Tef | 13.0 | 253 | 8.5 | 2-40 |
| Wheat | 16.8 | 291 | 13.0 | 2-84 |

| Crop type | Productivity (qt ha$^{-1}$) within zones | | | |
|---|---|---|---|---|
| | Prod. (qt ha$^{-1}$) | No. of HOUSEHOLD | SD | Ranges |
| Barley | 15.2 | 189 | 9.9 | 2-64 |
| Kerkaeta | 14 | 3 | 8.7 | 8-24 |
| Sorghum | 28.3 | 143 | 22.9 | 2- |
| Lequa | 20 | 6 | 14.1 | 6-40 |
| Maize | 17.7 | 17 | 14.6 | 4-48 |
| Finger millet | | | | |
| **Pulses** | | | | |
| Faba bean | 9.1 | 7 | 6.3 | 4-20 |
| Pulses | 12.5 | 27 | 18.4 | 2- |
| Lentils | 8.2 | 11 | 5.3 | 4-20 |
| **Root crops** | | | | |
| Potatoes | | | | |
| Onion | 24 | 2 | 5.7 | 20-28 |
| **South Eastern Zone** | | | | |
| **Cereals** | | | | |
| Tef | 8.3 | 145 | 6.8 | 2-30 |
| Wheat | 14.2 | 172 | 16.1 | 1- |
| Barley | 13.0 | 147 | 8.8 | 2-40 |
| Kerkaeta | 9 | 15 | 5.8 | 1-20 |
| Sorghum | 13.7 | 63 | 12.1 | 0.4-60 |
| Lequa | 13.3 | 6 | 9.0 | 4-24 |
| Maize | 13 | 6 | 9.3 | 4-28 |
| Finger millet | 6 | 1 | | |
| **Pulses** | | | | |
| Faba bean | 6.6 | 7 | 6.9 | 2-20 |
| Pulses | 9.4 | 8 | 8.0 | 2-24 |
| Lentils | 10 | 4 | 5.2 | 4-16 |
| **Oil crops** | | | | |
| Sesame | 8 | 2 | 0 | 8-8 |
| Linseed | 3 | 2 | 1.4 | 2-4 |
| Ground nut | | | | |
| **Root crops** | | | | |
| Potatoes | | | | |
| Onion | 30 | 1 | | |
| **Others** | | | | |

| Crop type | Productivity (qt ha$^{-1}$) within zones | | | |
|---|---|---|---|---|
| | Prod. (qt ha$^{-1}$) | No. of HOUSEHOLD | SD | Ranges |
| Sasila | | | | |
| **Western Zone** | | | | |
| **Cereals** | | | | |
| Tef | 8.8 | 58 | 6.4 | 2-32 |
| Wheat | 6.7 | 3 | 2.3 | 4-8 |
| Barley | 8.8 | 14 | 7.2 | 4-32 |
| Kerkaeta | | | | |
| Sorghum | 16.1 | 172 | 12.1 | 1-60 |
| Lequa | 8 | 1 | | |
| Maize | 7.5 | 48 | 6.5 | 1-29 |
| Finger millet | 12 | 1 | | |
| **Oil crops** | | | | |
| Sesame | 10.1 | 94 | 11.7 | 1-48 |
| Linseed | 4 | 1 | | |
| Ground nut | | | | |
| **North Western Zone** | | | | |
| **Cereals** | | | | |
| Tef | 7.5 | 270 | 6.7 | 1-40 |
| Wheat | | | | |
| Barley | 40 | | 1 | |
| Kerkaeta | | | | |
| Sorghum | 10.9 | 260 | 9.5 | 1-48 |
| Lequa | | | | |
| Maize | 9.6 | 352 | 7.2 | 1-40 |
| Finger millet | 7.0 | 48 | 6.4 | 1-40 |
| **Pulses** | | | | |
| Faba bean | 4 | 1 | | |
| Pulses | 3 | 2 | 1.4 | 2-4 |
| Lentils | | | | |
| **Oil crops** | | | | |
| Sesame | 5.4 | 11 | 3.1 | 1.7-13 |
| Linseed | | | | |
| Ground nut | | | | |
| **Vegetables** | | | | |

| Crop type | Productivity (qt ha$^{-1}$) within zones | | | |
|---|---|---|---|---|
| | Prod. (qt ha$^{-1}$) | No. of HOUSEHOLD | SD | Ranges |
| Vegetables | 4 | 1 | | |

Appendix Table 3.3.16. Response of households on having perennial crops

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=2191) | Eastern (N=1673) | Southern (N=1273) | South E (N=775) | Western (N=741) | North W (N=1481) |
| 1 | Yes | 26.6 | 44.5 | 32.4 | 25.0 | 16.6 | 15.0 |
| 2 | No | 73.4 | 55.5 | 67.6 | 75.0 | 83.4 | 85.0 |
| | Total | 100.0 | 100.0 | 100.0 | | 100.0 | 100.0 |

Appendix Table 3.3.17. Response of households on complete plough set possession by administrative zones

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=2191) | Eastern (N=1673) | Southern (N=1273) | South E (N=775) | Western (N=741) | North W (N=1481) |
| 1 | Yes | 63.2 | 55.0 | 67.6 | 65.3 | 51.7 | 69.3 |
| 2 | No | 36.8 | 45.0 | 32.4 | 34.7 | 48.3 | 30.7 |
| | Total | 100.0 | 100.0 | 100.0 | | 100.0 | 100.0 |

Appendix Table 3.3.18. Distribution of farm implements possession among households by administrative zones

| No. | Type of implement | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=5338) | Eastern (N=3322) | Southern (N=2947) | South E (N=1779) | Western (N=1229) | North W (N=3741) |
| 1 | Complete plough set | 25.9 | 27.7 | 29.2 | 28.4 | 31.2 | 27.5 |
| 2 | Hoe | 22.0 | 21.4 | 23.0 | 22.4 | 24.1 | 22.7 |
| 3 | Axe | 17.9 | 17.5 | 16.6 | 17.0 | 15.5 | 17.1 |
| 4 | Sickle | 17.6 | 17.2 | 16.4 | 16.9 | 15.5 | 16.7 |
| 5 | Spade | 15.8 | 15.4 | 14.1 | 15.2 | 13.7 | 15.8 |
| 6 | Tractor | 0.5 | 0.5 | 0.4 | 0.1 | 0.1 | 0.2 |
| 7 | Harvester machine | 0.3 | 0.2 | 0.3 | | | 0.1 |
| 8 | Others | | | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.19. Distribution of farm implements possession among households by administrative zones

| No. | Type of implement | Administrative zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Central | | Eastern | | Southern | | South E | | Western | | North W | |
| | | No | % | No | % | No | % | No | % | No | % | No | % |
| | Complete plough set | | | | | | | | | | | | |
| | 1 | 833 | 63.3 | 546 | 63.4 | 671 | 80.4 | 391 | 79.3 | 268 | 72.0 | 640 | 66.5 |
| | 2 | 186 | 14.1 | 89 | 10.3 | 83 | 9.9 | 51 | 10.3 | 59 | 15.9 | 175 | 18.2 |
| | 3 | 12 | 0.9 | 15 | 1.7 | 16 | 1.9 | 12 | 2.4 | 6 | 1.6 | 31 | 3.2 |
| | 4 or more | 284 | 21.6 | 211 | 24.5 | 65 | 7.8 | 39 | 7.9 | 39 | 10.5 | 117 | 12.1 |
| | hoe | | | | | | | | | | | | |
| | 1 | 82 | 84.5 | 78 | 82.1 | 86 | 86.9 | 41 | 82.0 | 50 | 61.0 | 79 | 65.3 |
| | 2 | 11 | 11.3 | 15 | 15.8 | 11 | 11.1 | 6 | 12.0 | 15 | 18.3 | 29 | 24.0 |
| | 3 | | | 1 | 1.1 | 1 | 1.0 | 1 | 2.0 | 6 | 7.3 | 4 | 3.3 |
| | 4 or more | 4 | 4.1 | 1 | 1.1 | 1 | 1.0 | 2 | 4.0 | 11 | 13.4 | 9 | 7.4 |
| | Sickle | | | | | | | | | | | | |
| | 1 | 13 | 38.2 | 14 | 41.2 | 34 | 50.0 | 16 | 47.1 | 12 | 36.4 | 23 | 52.3 |
| | 2 | 16 | 47.1 | 12 | 35.3 | 30 | 44.1 | 12 | 35.3 | 11 | 33.3 | 15 | 34.1 |
| | 3 | 2 | 5.9 | 4 | 11.8 | 3 | 4.4 | 4 | 11.8 | 6 | 18.2 | 1 | 2.3 |
| | 4 or more | 3 | 8.8 | 4 | 11.8 | 1 | 1.5 | 2 | 5.9 | 4 | 12.1 | 5 | 11.4 |
| | Spade | | | | | | | | | | | | |
| | 1 | 28 | 84.8 | 29 | 87.9 | 22 | 88.0 | 12 | 80.0 | 26 | 76.5 | 31 | 79.5 |
| | 2 | 2 | 6.1 | 3 | 9.1 | 2 | 8.0 | | | 4 | 11.8 | 5 | 12.8 |
| | 3 | | | | | | | | | 1 | 2.9 | 1 | 2.6 |
| | 4 or more | 3 | 9.1 | 1 | 3.0 | 1 | 4.0 | 3 | 20.0 | 3 | 8.8 | 2 | 5.1 |
| | Triddle pump | | | | | | | | | | | | |
| | 1 | 6 | 50.0 | 7 | 70.0 | 10 | 83.3 | 4 | 57.1 | 7 | 70.0 | 10 | 66.7 |
| | 2 | 2 | 16.7 | 2 | 20.0 | 1 | 8.3 | | | | | 2 | 13.3 |
| | 3 | | | | | | | | | | | | |
| | 4 or more | 4 | 33.3 | 1 | 10.0 | 1 | 8.3 | 3 | 42.9 | 3 | 30.0 | 3 | 20.0 |
| | drip | | | | | | | | | | | | |
| | 1 | 6 | 50.0 | 5 | 62.5 | 5 | 71.4 | 2 | 40.0 | 4 | 57.1 | 9 | 64.3 |
| | 2 | 2 | 16.7 | 2 | 25.0 | 1 | 14.3 | | | | | 2 | 14.3 |
| | 3 | | | | | | | | | | | | |
| | 4 or more | 4 | 33.3 | 1 | 12.5 | 1 | 14.3 | 3 | 60.0 | 3 | 42.9 | 3 | 21.4 |
| | Axe | | | | | | | | | | | | |
| | 1 | 6 | 50.0 | 7 | 70.0 | 10 | 83.3 | 4 | 57.1 | 7 | 70.0 | 10 | 66.7 |
| | 2 | 2 | 16.7 | 2 | 20.0 | 1 | 8.3 | | | | | 2 | 13.3 |
| | 3 | | | | | | | | | | | | |
| | 4 or more | 4 | 33.3 | 1 | 10.0 | 1 | 8.3 | 3 | 42.9 | 3 | 30.0 | 3 | 20.0 |

Appendix Table 3.3.20. Response of households on the number of ox owned

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=1741) | Eastern (N=1193) | Southern (N=1138) | South E (N=687) | Western (N=573) | North W (N=1234) |
| 1 | None | 31.1 | 37.6 | 37.2 | 40.2 | 46.8 | 22.5 |
| 2 | One ox | 34.2 | 37.2 | 25.1 | 27.8 | 16.1 | 22.3 |
| 3 | Two oxen | 33.1 | 23.2 | 33.8 | 29.7 | 28.4 | 47.3 |
| 4 | 3-4 oxen | 1.6 | 1.8 | 3.4 | 2.2 | 8.2 | 7.5 |
| 5 | 5-6 oxen | 0.1 | 0.0 | 0.4 | 0.0 | 0.5 | 0.2 |
| 6 | >6 oxen | 0.0 | 0.1 | 0.1 | 0.1 | 0.0 | 0.2 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.21. Response of households on the means how to plough if only one or none ox owned

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=1136) | Eastern (N=893) | Southern (N=709) | South E (N=467) | Western (N=360) | North W (N=553) |
| 1 | Renting ox/oxen | 14.0 | 12.4 | 12.1 | 14.1 | 25.0 | 15.4 |
| 2 | Share ox | 49.9 | 53.4 | 46.7 | 41.5 | 15.0 | 46.7 |
| 3 | Pairing with cow, donkey, camel/mule | 6.4 | 1.5 | 0.8 | 4.1 | 2.8 | 2.4 |
| 4 | Using only cow or mule | 0.3 | 0.1 | 0.0 | 0.2 | 0.0 | 0.0 |
| 5 | Digging with labour | 1.1 | 0.6 | 0.8 | 0.4 | 1.4 | 1.8 |
| 6 | Others | 28.3 | 32.0 | 39.5 | 39.6 | 55.8 | 33.8 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.22. Response of households on sufficiency of household size to carry out agricultural activities

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=1742) | Eastern (N=1191) | Southern (N=1138) | South E (N=687) | Western (N=574) | North W (N=1234) |
| 1 | Sufficient | 41.3 | 42.1 | 63.1 | 59.1 | 66.4 | 58.8 |
| 2 | Insufficient | 55.6 | 54.7 | 35.9 | 39.9 | 31.9 | 39.7 |
| 3 | Excess | 3.0 | 3.2 | 1.1 | 1.0 | 1.7 | 1.5 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.23. Response of households on the occurrence of labor shortages during major agricultural Activities

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=698) | Eastern (N=437) | Southern (N=590) | South E (N=392) | Western (N=306) | North W (N=587) |
| 1 | Ploughing and sowing | 9.7 | 24.5 | 26.1 | 6.4 | 22.2 | 6.5 |
| 2 | Weeding | 9.5 | 11.9 | 35.1 | 19.4 | 28.4 | 10.9 |
| 3 | Harvesting and threshing | 19.2 | 25.2 | 27.3 | 20.2 | 16.3 | 8.3 |
| 4 | Looking after cattle | 0.6 | 1.4 | 0.8 | 1.0 | 0.0 | 0.0 |
| 5 | Others | 6.7 | 10.3 | 9.7 | 7.9 | 0.0 | 0.0 |
| 6 | 1 & 2 | 3.0 | 0.2 | 0.0 | 1.3 | 1.0 | 1.5 |
| 7 | 1 & 3 | 5.3 | 3.4 | 0.3 | 2.6 | 1.0 | 2.2 |
| 8 | 2 & 3 | 13.8 | 2.3 | 0.3 | 12.2 | 11.8 | 37.3 |
| 9 | 1, 2 & 3 | 24.5 | 14.6 | 0.3 | 26.5 | 19.3 | 30.5 |
| 10 | 2, 3, & 4 | 0.3 | 0.2 | 0.0 | 0.0 | 0.0 | 2.7 |
| 11 | 1, 2, 3 & 4 | 7.4 | 5.9 | 0.0 | 2.6 | 0.0 | 0.0 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.24. Response of households on how to overcome labour shortage during major activities

| No. | Attempt | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=699) | Eastern (N=441) | Southern (N=591) | South E (N=390) | Western (N=310) | North W (N=621) |
| 1 | Hiring labour | 8.7 | 17.7 | 29.6 | 20.3 | 59.0 | 16.9 |
| 2 | Village cooperation | 30.8 | 20.6 | 36.5 | 26.9 | 20.6 | 44.6 |
| 3 | Assistance from relatives | 26.0 | 32.0 | 11.5 | 6.7 | 6.1 | 8.2 |
| 4 | Others | 17.7 | 24.3 | 21.5 | 29.7 | 11.9 | 12.2 |
| 5 | 1 & 2 | 3.3 | 0.2 | 0.3 | 4.6 | 1.6 | 8.9 |
| 6 | 1 & 3 | 2.4 | 1.6 | 0.3 | 1.3 | 0.3 | 1.1 |
| 7 | 2 & 3 | 8.7 | 2.9 | 0.2 | 7.2 | | 6.6 |
| 8 | 1, 2 & 3 | 2.3 | 0.7 | | 3.3 | 0.3 | 1.4 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.25. Response of households on use of improved seeds

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=1616) | Eastern (N=1075) | Southern (N=967) | South E (N=571) | Western (N=738) | North W (N=1481) |
| 1 | Yes | 25.3 | 32.1 | 23.4 | 21.2 | 7.5 | 9.9 |
| 2 | No | 74.7 | 67.9 | 76.6 | 78.8 | 92.5 | 90.1 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.26. Response of households on source of local seeds

| No. | Source | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=1529) | Eastern (N=1052) | Southern (N=934) | South E (N=549) | Western (N=487) | North W (N=1070) |
| 1 | Cooperative | 7.6 | 10.2 | 8.7 | 6.6 | 1.0 | 3.2 |
| 2 | Govt | 6.7 | 8.5 | 4.5 | 1.6 | 1.2 | 0.7 |
| 3 | NGO's | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 |
| 4 | Relatives/friends | 20.5 | 14.4 | 13.1 | 6.2 | 50.9 | 52.1 |
| 5 | Local market | 16.5 | 21.1 | 26.6 | 28.4 | 8.8 | 9.0 |
| 6 | Others | 8.9 | 10.1 | 32.7 | 37.0 | 19.5 | 18.7 |
| 7 | 4 & 5 | 38.7 | 33.7 | 12.4 | 19.5 | 18.1 | 15.9 |
| 8 | 1 & 2 | 1.0 | 2.0 | 1.9 | 0.5 | 0.2 | 0.1 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.27. Response of house holders on use of improved seeds

| Crop type | No. of HOUSEHOLD with in zones of of Tigray | | | |
|---|---|---|---|---|
| | Yes | No | Total | % - Yes |
| **Central zone** | | | | |
| **Cereals** | | | | |
| Teff | 254 | 546 | 800 | 31.8 |
| Barley | 5 | 34 | 39 | 12.8 |
| Wheat | 46 | 33 | 79 | 58.2 |
| Kerkaeta | 2 | 11 | 13 | 15.4 |
| Maize | 51 | 181 | 232 | 22.0 |
| Sorghum | 38 | 323 | 361 | 10.5 |
| Finger millet | 9 | 46 | 55 | 16.4 |
| **Pulses** | | | | |
| Faba bean | 2 | 6 | 8 | |
| **Eastern Zone** | | | | |
| **Cereals** | | | | |
| Teff | 36 | 135 | 171 | 21.1 |
| Barley | 46 | 353 | 399 | 11.5 |
| Wheat | 273 | 114 | 387 | 70.5 |
| Kerkaeta | 4 | 27 | 31 | 12.9 |
| Maize | 10 | 40 | 50 | 20.0 |
| Sorghum | 3 | 21 | 24 | 12.5 |
| **Pulses** | | | | |
| Faba bean | 1 | 4 | 5 | 20.0 |
| Lentils | 1 | 6 | 7 | 14.3 |
| **Southern Zone** | | | | |
| **Cereals** | | | | |
| Teff | 15 | 131 | 146 | 10.3 |
| Barley | 22 | 157 | 179 | 12.3 |

| | | | | |
|---|---|---|---|---|
| Wheat | 144 | 158 | 302 | 47.7 |
| Maize | 6 | 13 | 19 | 31.6 |
| Sorghum | 12 | 137 | 149 | 8.1 |
| **Pulses** | | | | |
| Faba bean | | | | |
| Pulses | 4 | 25 | 29 | |
| **South Eastern** | | | | |
| **Cereals** | | | | |
| Teff | 13 | 47 | 60 | 21.7 |
| Barley | 9 | 145 | 154 | 5.8 |
| Wheat | 94 | 72 | 166 | 56.6 |
| Sorghum | 4 | 59 | 63 | 6.3 |
| **Pulses** | | | | |
| Faba bean | | | | |
| Pulses | 1 | 8 | 9 | 11.1 |
| **Western Zone** | | | | |
| **Cereals** | | | | |
| Teff | 15 | 131 | 146 | 10.3 |
| Wheat | 1 | 3 | 4 | 25.0 |
| Maize | 2 | 44 | 46 | 4.3 |
| Sorghum | 12 | 172 | 184 | 6.5 |
| **Oil crops** | | | | |
| Sesame | 13 | 70 | 89 | |
| **North Western Zone** | | | | |
| **Cereals** | | | | |
| Teff | 85 | 241 | 326 | 26.1 |
| Barley | | | | |
| Wheat | | | | |
| Kerkaeta | | | | |
| Maize | 32 | 283 | 315 | 10.2 |
| Sorghum | 10 | 258 | 268 | 3.7 |
| Lequa | | | | |
| Finger millet | 2 | 40 | 42 | 4.8 |
| **Oil crops** | | | | |
| Sesame | 4 | 8 | 12 | 33.3 |

Appendix Table 3.3.28. Response of house holders on amount of improved seeds (kg) used

| Crop type | No. of HOUSEHOLD within zones | | | |
|---|---|---|---|---|
| | Mean | Obs | SD | Ranges |
| **Central Zone** | | | | |
| **Cereals** | | | | |
| Tef | 12.8 | 254 | 17.8 | 0.5-330 |
| Barley | 29.0 | 5 | 19.5 | 10-50 |
| Wheat | 33.2 | 45 | 20.5 | 3-100 |
| Kerkaeta | 13.5 | 2 | 16.3 | 2-25 |
| Maize | 18.2 | 51 | 31.3 | 1.5-200 |
| Sorghum | 14.2 | 37 | 12.8 | 1-50 |
| **Pulses** | | | | |
| Faba bean | 28.5 | 2 | 30.4 | 7-50 |
| **Eastern Zone** | | | | |
| **Cereals** | | | | |
| Tef | 25.6 | 36.0 | 23.9 | 5-100 |
| Barley | 35.0 | 46 | 22.2 | 2-100 |
| Wheat | 61.1 | 273 | 189.5 | 2-3000 |
| Kerkaeta | 31.3 | 4 | 12.5 | 25-30 |
| Maize | 6.3 | 9 | 5.1 | 1-15 |
| Sorghum | 26.0 | 3 | 20.9 | 12-50 |
| **Pulses** | | | | |
| Faba bean | 12 | 1.0 | | |
| **Southern Zone** | | | | |
| **Cereals** | | | | |
| Tef | 25.6 | 36.0 | 23.9 | 10-100 |
| Barley | 45 | 22 | 23.9 | 15-100 |
| Wheat | 53.5 | 145 | 69.5 | 3-680 |
| Maize | 7 | 6 | 3.5 | 2-10 |
| Sorghum | 16.6 | 12 | 16.5 | 3-50 |
| **Pulses** | | | | |
| Faba bean | | | | |
| Pulses | 35.3 | 4 | 11.1 | 25-50 |
| **South eastern Zone** | | | | |
| **Cereals** | | | | |
| Tef | 28.9 | 35.0 | 25.2 | 2-408 |
| Barley | 52.2 | 9 | 21.7 | 30.-100 |
| Wheat | 77.3 | 94 | 139.0 | 1-1000 |
| Sorghum | 12 | 4 | 11.3 | 3-28 |
| **Western Zone** | | | | |
| **Cereals** | | | | |
| Tef | 35.3 | 4.0 | 11.1 | 15-45 |
| Wheat | 10 | 1 | | 10-10 |
| Maize | 1.5 | 2 | 0.8 | 1-2 |

| | | | | |
|---|---|---|---|---|
| Sorghum | 19.0 | 12 | 9.7 | 6-32 |
| **Oil crops** | | | | |
| Sesame | 20.6 | 19 | 23.0 | 2-100 |
| **North Western Zone** | | | | |
| **Cereals** | | | | |
| Tef | 22.9 | 71 | 28.3 | 3-200 |
| Barley | 16.8 | 9 | 6.6 | 7-30 |
| Wheat | 8.6 | 5 | 4.7 | 3.75-15 |
| Maize | 12.1 | 32 | 19.2 | 1-112 |
| Sorghum | 15.5 | 10 | 6.9 | 6-28 |
| Finger millet | 22.5 | 2 | 3.5 | 20.25 |
| **Oil crops** | | | | |
| Sesame | 6.3 | 4 | 4.6 | 2-12 |

Appendix Table 3.3.29. Reason for not using improved seeds

| No. | Source | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=409) | Eastern (N=384) | Southern (N=226) | South E (N=121) | Western (N=55) | North W (N=146) |
| 1 | Expensive | 79.0 | 81.8 | 69.9 | 71.9 | 65.5 | 71.9 |
| 2 | Not available | 6.8 | 7.3 | 11.1 | 13.2 | 16.4 | 8.2 |
| 3 | No significant difference in the yields from that of the local seeds | 1.0 | 1.0 | 0.4 | 0.8 | | 2.1 |
| 4 | Lack of knowledge | 2.2 | 0.8 | 0.4 | 1.7 | 1.8 | 2.1 |
| 5 | Susceptible to pests and diseases | 0.7 | 0.3 | 1.8 | 1.7 | 9.1 | 2.1 |
| 6 | Intolerance to water stress | 2.9 | 2.9 | 4.4 | 0.8 | 7.3 | 6.2 |
| 7 | Lower straw productivity | 3.2 | 4.2 | 3.1 | 2.5 | | 4.8 |
| 8 | Lower palatability | 1.7 | | 3.5 | 2.5 | | |
| 9 | Others | 2.4 | 1.8 | 5.3 | 5.0 | | 2.7 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.30. Response of households on measures taken to maintain soil fertility

| No. | Measures taken | Response | |
|---|---|---|---|
| | | No | % |
| I. | Central | | |
| 1 | Apply manure | 33 | 2.1 |
| 2 | Apply commercial fertilizer | 252 | 25.7 |
| 3 | Practice terracing | 26 | 1.6 |
| 4 | Crop residue use | 1 | 0.1 |
| 5 | Planted trees and/or grass | 2 | 0.1 |
| 6 | Others | 63 | 3.9 |
| 7 | 1 & 2 | 423 | 26.4 |
| 8 | 1 & 3 | 18 | 1.1 |
| 9 | 2 & 3 | 126 | 7.9 |
| 10 | 2 & 4 | 2 | 0.1 |
| 11 | 3 & 4 | 3 | 0.2 |
| 12 | 1, 2 & 3 | 625 | 39.0 |
| 13 | 1, 3 & 4 | 6 | 0.4 |
| 14 | 2, 3 & 4 | 24 | 1.5 |
| | Total | 1604 | |
| II. | Eastern | | |
| 1 | Apply manure | 42 | 3.8 |
| 2 | Apply commercial fertilizer | 231 | 20.9 |
| 3 | Practice terracing | 17 | 1.5 |
| 4 | Crop residue use | 1 | 0.1 |
| 5 | Planted trees and/or grass | 0 | 0.0 |
| 6 | Others | 46 | 4.2 |
| 7 | 1 & 2 | 280 | 25.3 |
| 8 | 1 & 3 | 20 | 1.8 |
| 9 | 2 & 3 | 101 | 9.1 |
| 10 | 2 & 4 | 1 | 0.1 |
| 11 | 3 & 4 | 2 | 0.2 |
| 12 | 1, 2 & 3 | 347 | 31.3 |
| 13 | 1, 3 & 4 | 4 | 0.4 |
| 14 | 2, 3 & 4 | 15 | 1.4 |
| | Total | 1107 | |
| III. | Southern | | |
| 1 | Apply manure | 64 | 5.9 |
| 2 | Apply commercial fertilizer | 357 | 33.1 |
| 3 | Practice terracing | 86 | 8.0 |
| 4 | Crop residue use | 1 | 0.1 |
| 5 | Planted trees and/or grass | 6 | 0.6 |
| 6 | Others | 169 | 15.7 |
| 7 | 1 & 2 | 96 | 8.9 |
| 8 | 1 & 3 | 18 | 1.7 |
| 9 | 2 & 3 | 95 | 8.8 |
| 10 | 2 & 4 | 3 | 0.3 |

| | | | |
|---|---|---|---|
| 11 | 3 & 4 | 12 | 1.1 |
| 12 | 1, 2 & 3 | 149 | 13.8 |
| 13 | 1, 3 & 4 | 6 | 0.6 |
| 14 | 2, 3 & 4 | 15 | 1.4 |
| | Total | 1077 | |
| IV. | South Eastern | | |
| 1 | Apply manure | 25 | 3.8 |
| 2 | Apply commercial fertilizer | 245 | 37.5 |
| 3 | Practice terracing | 34 | 5.2 |
| 4 | Crop residue use | | 0.0 |
| 5 | Planted trees and/or grass | | 0.0 |
| 6 | Others | 73 | 11.2 |
| 7 | 1 & 2 | 66 | 10.1 |
| 8 | 1 & 3 | 10 | 1.5 |
| 9 | 2 & 3 | 80 | 12.2 |
| 10 | 2 & 4 | | 0.0 |
| 11 | 3 & 4 | 8 | 1.2 |
| 12 | 1, 2 & 3 | 104 | 15.9 |
| 13 | 1, 3 & 4 | 2 | 0.3 |
| 14 | 2, 3 & 4 | 7 | 1.1 |
| | Total | 654 | |
| V. | Western | | |
| 1 | Apply manure | 74 | 13.1 |
| 2 | Apply commercial fertilizer | 100 | 17.7 |
| 3 | Practice terracing | 69 | 12.2 |
| 4 | Crop residue use | 13 | 2.3 |
| 5 | Planted trees and/or grass | 1 | 0.2 |
| 6 | Others | 200 | 35.3 |
| 7 | 1 & 2 | 44 | 7.8 |
| 8 | 1 & 3 | 24 | 4.2 |
| 9 | 2 & 3 | 15 | 2.7 |
| 10 | 2 & 4 | 3 | 0.5 |
| 11 | 3 & 4 | 1 | 0.2 |
| 12 | 1, 2 & 3 | 22 | 3.9 |
| 13 | 1, 3 & 4 | | 0.0 |
| 14 | 2, 3 & 4 | | 0.0 |
| | Total | 566 | |
| VI. | North Western | | |
| 1 | Apply manure | 85 | 15.0 |
| 2 | Apply commercial fertilizer | 330 | 58.3 |
| 3 | Practice terracing | 22 | 3.9 |
| 4 | Crop residue use | 0 | 0.0 |
| 5 | Planted trees and/or grass | 1 | 0.2 |
| 6 | Others | 102 | 18.0 |
| 7 | 1 & 2 | 322 | 56.9 |

| | | | |
|---|---|---|---|
| 8 | 1 & 3 | 24 | 4.2 |
| 9 | 2 & 3 | 92 | 16.3 |
| 10 | 2 & 4 | 1 | 0.2 |
| 11 | 3 & 4 | 2 | 0.4 |
| 12 | 1, 2 & 3 | 233 | 41.2 |
| 13 | 1, 3 & 4 | 1 | 0.2 |
| 14 | 2, 3 & 4 | 6 | 1.1 |
| | Total | 1221 | |

Appendix Table 3.3.31. Response of households on availability of chemical fertilizers on time

| No. | Source | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=1587) | Eastern (N=1057) | Southern (N=961) | South E (N=533) | Western (N=188) | North W (N=994) |
| 1 | Yes | 92.5 | 93.0 | 95.5 | 95.7 | 96.3 | 97.6 |
| 2 | No | 7.5 | 7.0 | 4.5 | 4.3 | 3.7 | 2.4 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.32. Response of householder to the consumption of different rates fertilizer

| No | Rate of fertilizer consumed (kg/ha | Response of HOUSEHOLD in % within zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central | Eastern | Southern | South Eastern | Western | North Western |
| | | Urea | | | | | |
| | | N=1490 | N=970 | N=734 | N=508 | N=162 | N=861 |
| 1 | <50 | 92.1 | 93.6 | 91.7 | 86.0 | 80.9 | 79.8 |
| 2 | 51-100 | 6.4 | 5.6 | 7.1 | 12.6 | 14.2 | 17.0 |
| 3 | 101-150 | 0.9 | 0.6 | 1.1 | 0.8 | 2.5 | 2.4 |
| 4 | 151-200 | 0.3 | 0.1 | 0.0 | 0.0 | 1.2 | 0.7 |
| 5 | 201-300 | 0.3 | 0.1 | 0.1 | 0.4 | 0.0 | 0.0 |
| 6 | 301-400 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 7 | 401-600 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 |
| 8 | >600 | 0.0 | 0.0 | 0.0 | 0.0 | 1.2 | 0.1 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| | | DAP | | | | | |
| | | N=1507 | N=974 | N=731 | N=526 | N=170 | N=965 |
| 1 | <50 | 90.9 | 91.9 | 92.6 | 81.0 | 76.5 | 67.4 |
| 2 | 51-100 | 7.6 | 7.0 | 6.0 | 15.6 | 17.6 | 25.9 |
| 3 | 101-150 | 0.9 | 0.4 | 1.0 | 2.1 | 1.2 | 4.5 |
| 4 | 151-200 | 0.4 | 0.4 | 0.0 | 0.6 | 0.6 | 1.6 |
| 5 | 201-300 | 0.1 | 0.3 | 0.3 | 0.8 | 2.4 | 0.4 |
| 6 | 301-400 | 0.1 | 0.0 | 0.0 | 0.0 | 0.6 | 0.1 |
| 7 | 401-600 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 8 | >600 | 0.1 | 0.0 | 0.1 | 0.0 | 1.2 | 0.2 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| | | Others | | | | | |
| | | N=75 | N=63 | N=21 | N=8 | N=7 | N=28 |
| 1 | <50 | 96.0 | 90.5 | 61.9 | 50.0 | 14.3 | 46.4 |
| 2 | 51-100 | 4.0 | 7.9 | 14.3 | 37.5 | 28.6 | 10.7 |
| 3 | 101-150 | 0.0 | 0.0 | 9.5 | 0.0 | 0.0 | 0.0 |
| 4 | 151-200 | 0.0 | 1.6 | 4.8 | 0.0 | 14.3 | 7.1 |
| 5 | 201-300 | 0.0 | 0.0 | 4.8 | 0.0 | 0.0 | 0.0 |
| 6 | 301-400 | 0.0 | 0.0 | 4.8 | 0.0 | 14.3 | 0.0 |
| 7 | 401-600 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.6 |
| 8 | >600 | 0.0 | 0.0 | 0.0 | 12.5 | 28.6 | 32.1 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.33. Response of householder to the consumption of different rates fertilizer

| No | Rate of fertilizer consumed (kg/ha | Response of HOUSEHOLD in % within zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central | Eastern | Southern | South Eastern | Western | North Western |
| | | **Urea** | | | | | |
| | | N=1377 | N=885 | N=669 | N=469 | N=142 | N=760 |
| 1 | <50 | 41.8 | 32.0 | 45.6 | 53.1 | 32.4 | 32.5 |
| 2 | 51-100 | 41.4 | 48.1 | 39.8 | 37.5 | 34.5 | 36.2 |
| 3 | 101-150 | 4.8 | 5.6 | 4.0 | 4.7 | 0.7 | 4.3 |
| 4 | 151-200 | 9.0 | 10.4 | 7.6 | 3.4 | 21.8 | 20.5 |
| 5 | >200 | 3.0 | 3.8 | 3.0 | 1.3 | 10.6 | 6.4 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| | | **DAP** | | | | | |
| | | N=1398 | N=888 | N=667 | N=486 | N=147 | N=850 |
| 1 | <50 | 40.8 | 29.3 | 45.0 | 48.4 | 26.5 | 27.3 |
| 2 | 51-100 | 42.0 | 48.3 | 40.9 | 40.5 | 34.7 | 33.8 |
| 3 | 101-150 | 5.1 | 7.1 | 3.9 | 6.6 | 0.7 | 6.6 |
| 4 | 151-200 | 9.7 | 10.8 | 7.3 | 3.1 | 24.5 | 22.0 |
| 5 | >200 | 2.4 | 4.5 | 2.8 | 1.4 | 13.6 | 10.4 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| | | **Others** | | | | | |
| | | N=73 | N=61 | N=17 | N=6 | N=6 | N=27 |
| 1 | <50 | 91.8 | 77.0 | 58.8 | 50.0 | 0.0 | 18.5 |
| 2 | 51-100 | 8.2 | 11.5 | 0.0 | 33.3 | 16.7 | 11.1 |
| 3 | 101-150 | 0.0 | 0.0 | 17.6 | 16.7 | 0.0 | 7.4 |
| 4 | 151-200 | 0.0 | 6.6 | 5.9 | 0.0 | 0.0 | 18.5 |
| 5 | >200 | 0.0 | 4.9 | 17.6 | 0.0 | 83.3 | 44.4 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.34. Response of households on reason for not using chemical fertilizer

| No. | Response | Response | |
|---|---|---|---|
| | | No | % |
| I. | Central | | |
| 1 | It is not useful | 78 | 19 |
| 2 | Expensive | 181 | 44.1 |
| 3 | Shortage of money | 25 | 6.1 |
| 4 | Not available | 4 | 1.0 |
| 5 | No credit service | 1 | 0.2 |
| 6 | No significant difference in production | 8 | 2.0 |
| 7 | Fear of drought | 4 | 1.0 |
| 8 | Others | 109 | 26.0 |
| | Total | 410 | |
| II. | Eastern | | |
| 1 | It is not useful | 128 | 16.4 |
| 2 | Expensive | 357 | 45.8 |
| 3 | Shortage of money | 42 | 5.4 |
| 4 | Not available | 7 | 0.9 |
| 5 | No credit service | 2 | 0.3 |
| 6 | No significant difference in production | 7 | 0.9 |
| 7 | Fear of drought | 26 | 3.3 |
| 8 | Others | 210 | 27.0 |
| | Total | 779 | |
| III. | Southern | | |
| 1 | It is not useful | 127 | 11.5 |
| 2 | Expensive | 321 | 29.2 |
| 3 | Shortage of money | 41 | 3.7 |
| 4 | Not available | 9 | 0.8 |
| 5 | No credit service | 5 | 0.5 |
| 6 | No significant difference in production | 60 | 5.5 |
| 7 | Fear of drought | 90 | 8.2 |
| 8 | Others | 447 | 40.6 |
| | Total | 1100 | |
| IV. | South Eastern | | |
| 1 | It is not useful | 17 | 6.5 |
| 2 | Expensive | 89 | 34.0 |
| 3 | Shortage of money | 13 | 5.0 |
| 4 | Not available | 1 | 0.4 |
| 5 | No credit service | 4 | 1.5 |
| 6 | No significant difference in production | 7 | 2.7 |
| 7 | Fear of drought | 10 | 3.8 |
| 8 | Others | 121 | 46.2 |
| | Total | 262 | |
| V. | Western | | |
| 1 | It is not useful | 53 | 10.6 |
| 2 | Expensive | 169 | 33.7 |

| | | | |
|---|---|---|---|
| 3 | Shortage of money | 50 | 10.0 |
| 4 | Not available | 9 | 1.8 |
| 5 | No credit service | 9 | 1.8 |
| 6 | No significant difference in production | 32 | 6.4 |
| 7 | Fear of drought | 32 | 6.4 |
| 8 | Others | 148 | 29.5 |
| | Total | 502 | |
| VI. North Western | | | |
| 1 | It is not useful | 27 | 6.5 |
| 2 | Expensive | 159 | 38.4 |
| 3 | Shortage of money | 43 | 10.4 |
| 4 | Not available | | 0.0 |
| 5 | No credit service | 3 | 0.7 |
| 6 | No significant difference in production | 9 | 2.2 |
| 7 | Fear of drought | 19 | 4.6 |
| 8 | Others | 154 | 37.2 |
| | Total | 414 | |

Appendix Table 3.3.35. Response of households on practice of crop rotation

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=1585) | Eastern (N=1067) | Southern (N=961) | South E (N=590) | Western (N=475) | North W (N=1098) |
| 1 | Yes | 87.9 | 87.8 | 14.3 | 96.4 | 86.9 | 83.9 |
| 2 | No | 12.1 | 12.2 | 85.7 | 3.6 | 13.1 | 16.1 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.36. Response of households on using intercropping

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=1585) | Eastern (N=1067) | Southern (N=961) | South E (N=590) | Western (N=475) | North W (N=1098) |
| 1 | Yes | 37.5 | 38.3 | 12.3 | 12.4 | 8.4 | 8.6 |
| 2 | No | 62.5 | 61.7 | 87.7 | 87.6 | 91.6 | 91.4 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.37. Response of households on practice of fallow system

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=1585) | Eastern (N=1067) | Southern (N=961) | South E (N=590) | Western (N=475) | North W (N=1098) |
| 1 | Yes | 37.7 | 44.5 | 17.4 | 23.2 | 37.1 | 41.5 |
| 2 | No | 62.3 | 55.5 | 82.6 | 76.8 | 62.9 | 58.5 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.38. Distribution of households by reason for not practicing fallow system

| No. | Reason | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=987) | Eastern (N=592) | Southern (N=794) | South E (N=453) | Western (N=299) | North W (N=642) |
| 1 | Shortage of farm lands | 95.8 | 97.1 | 88.0 | 90.7 | 75.3 | 88.0 |
| 2 | Encouraged by increased crop prices | 1.1 | 1.0 | 1.3 | 1.8 | 2.0 | 0.9 |
| 3 | Lack of knowledge | 1.5 | 1.4 | 6.8 | 4.4 | 16.7 | 5.9 |
| 4 | Others | 1.5 | 0.5 | 3.9 | 3.1 | 6.0 | 5.1 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.39. Response of households on reasons for not using chemicals against weeds, pests and crop diseases

| No. | Response | Weeds | | Pests | | Crop diseases | |
|---|---|---|---|---|---|---|---|
| | | No. of HOUSEHOLD | % | No. of HOUSEHOLD | % | No. of HOUSEHOLD | % |
| I. | Central | | | | | | |
| 1 | Lack of knowledge | 236 | | | | 274 | |
| 2 | Expensive | 232 | | | | 319 | |
| 3 | Shortage of money | 109 | | | | 104 | |
| 4 | Not Available | 68 | | | | 149 | |
| 5 | No credit services | 3 | | | | 7 | |
| 6 | Suspect its effectiveness | 65 | | | | 58 | |
| 7 | Fears of drought occurrence | 43 | | | | 29 | |
| 8 | Others | 198 | | | | 114 | |
| | Total | | | | | | |
| II. | Eastern | | | | | | |
| 1 | Lack of knowledge | 197 | | | | 202 | |
| 2 | Expensive | 236 | | | | 218 | |
| 3 | Shortage of money | 82 | | | | 105 | |
| 4 | Not Available | 88 | | | | 129 | |
| 5 | No credit services | 2 | | | | 7 | |
| 6 | Suspect its effectiveness | 49 | | | | 47 | |
| 7 | Fears of drought occurrence | 42 | | | | 35 | |
| 8 | Others | 134 | | | | 90 | |
| | Total | | | | | | |
| III. | Southern | | | | | | |
| 1 | Lack of knowledge | | | | | 132 | |
| 2 | Expensive | | | | | 121 | |

| | | | |
|---|---|---|---|
| 3 | Shortage of money | | 43 |
| 4 | Not Available | | 68 |
| 5 | No credit services | | 8 |
| 6 | Suspect its effectiveness | | 39 |
| 7 | Fears of drought occurrence | | 26 |
| 8 | Others | | 206 |
| | Total | | |
| IV. | South Eastern | | |
| 1 | Lack of knowledge | | 92 |
| 2 | Expensive | | 111 |
| 3 | Shortage of money | | 47 |
| 4 | Not Available | | 51 |
| 5 | No credit services | | 10 |
| 6 | Suspect its effectiveness | | 38 |
| 7 | Fears of drought occurrence | | 46 |
| 8 | Others | | 91 |
| | Total | | |
| V. | Western | | |
| 1 | Lack of knowledge | | 46 |
| 2 | Expensive | | 47 |
| 3 | Shortage of money | | 11 |
| 4 | Not Available | | 37 |
| 5 | No credit services | | 2 |
| 6 | Suspect its effectiveness | | 12 |
| 7 | Fears of drought occurrence | | 11 |
| 8 | Others | | 61 |
| | Total | | |
| VI. | North Western | | |
| 1 | Lack of knowledge | 56 | 111 |
| 2 | Expensive | 242 | 151 |
| 3 | Shortage of money | 65 | 51 |
| 4 | Not Available | 16 | 103 |
| 5 | No credit services | 11 | 18 |
| 6 | Suspect its effectiveness | 50 | 40 |
| 7 | Fears of drought occurrence | 32 | 32 |
| 8 | Others | 179 | 146 |
| | Total | | |

Appendix Table 3.3.40. Households response on frequency of harvest

| No. | Frequency | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=1741) | Eastern (N=1193) | Southern (N=1138) | South E (N=687) | Western (N=573) | North W (N=1234) |
| 1 | Once | 98.2 | 97.4 | 89.5 | 98.8 | 99.3 | 99.4 |
| 2 | Twice | 1.7 | 2.5 | 9.9 | 1.2 | 0.7 | 0.6 |
| 3 | Three times | 0.1 | 0.1 | 0.5 | 0.0 | 0.0 | 0.1 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.41. Households response on sufficiency of food until next harvest

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=1741) | Eastern (N=1193) | Southern (N=1138) | South E (N=687) | Western (N=573) | North W (N=1234) |
| 1 | Yes | 20.9 | 15.8 | 39.3 | 29.4 | 62.7 | 54.1 |
| 2 | No | 79.1 | 84.2 | 60.7 | 70.6 | 37.3 | 45.9 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.42. Response of households on period of food shortage

| No. | Period (months) | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=1377) | Eastern (N=1005) | Southern (N=676) | South E (N=477) | Western (N=182) | North W (N=544) |
| 1 | One month | 2.3 | 6.0 | 1.3 | 1.0 | 4.4 | 3.3 |
| 2 | Two months | 8.1 | 10.4 | 3.4 | 6.3 | 7.7 | 10.1 |
| 3 | Three months | 7.8 | 14.0 | 5.0 | 7.8 | 4.9 | 4.6 |
| 4 | Four to five months | 24.4 | 30.9 | 21.2 | 27.7 | 17.0 | 16.5 |
| 5 | Six months or more | 57.4 | 38.6 | 69.1 | 57.2 | 65.9 | 65.4 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.43. Households response on how to manage food shortage until next harvest

| No. | Means of management | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=1228) | Eastern (N=851) | Southern (N=604) | South E (N=398) | Western (N=206) | North W (N=495) |
| 1 | Assistance from relatives | 9.9 | 6.2 | 6.3 | 5.0 | 22.8 | 17.4 |
| 2 | Borrowing | 2.4 | 2.4 | 2.3 | 3.3 | 13.1 | 6.3 |
| 3 | Sell of animals | 21.4 | 12.6 | 24.8 | 15.8 | 20.9 | 28.1 |
| 4 | Aid | 14.0 | 27.5 | 20.5 | 26.1 | 1.0 | 5.3 |
| 5 | Others | 9.0 | 3.5 | 22.0 | 23.6 | 27.7 | 27.9 |
| 6 | 1 & 4 | 6.3 | 12.5 | 8.3 | 8.8 | 0.5 | 3.4 |
| 7 | 2 & 4 | 4.6 | 6.2 | 2.8 | 3.5 | 0.5 | 0.4 |
| 8 | 3 & 4 | 11.2 | 18.8 | 7.9 | 8.3 | 5.3 | 2.0 |
| 9 | 1 & 3 | 9.1 | 5.6 | 2.2 | 2.0 | 5.3 | 5.9 |
| 10 | 2 & 3 | 3.3 | 2.2 | 1.5 | 2.3 | 2.4 | 3.4 |
| 11 | 1 & 2 | 2.6 | 2.5 | 1.3 | 1.3 | | |
| 12 | 1, 3 & 4 | 3.3 | | | | | |
| 13 | 2, 3 & 4 | 2.9 | 10.4 | 3.4 | 6.3 | 7.7 | 10.1 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.44. For how long does the household stored harvested crop

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=1300) | Eastern (N=800) | Southern (N=837) | South E (N=558) | Western (N=361) | North W (N=757) |
| 1 | One month | 3.8 | 7.5 | 1.8 | 3.4 | 6.9 | 3.6 |
| 2 | Two months | 7.6 | 11.4 | 3.7 | 6.8 | 5.8 | 4.9 |
| 3 | 3-5 months | 31.7 | 44.0 | 21.0 | 25.3 | 15.8 | 18.4 |
| 4 | 6-8 months | 34.0 | 24.0 | 37.5 | 36.4 | 31.3 | 37.5 |
| 5 | >8 months | 22.9 | 13.1 | 36.0 | 28.1 | 40.2 | 35.7 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.45. What storage structure does the household use

| No. | Reason | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=1280) | Eastern (N=801) | Southern (N=832) | South E (N=561) | Western (N=346) | North W (N=672) |
| 1 | Plastic bag | 41.6 | 69.8 | 60.2 | 68.3 | 48.3 | 29.6 |
| 2 | Aibet | 1.3 | 0.5 | 1.8 | 2.0 | 2.6 | 1.8 |
| 3 | Sisal bag | 4.1 | 7.9 | 25.1 | 11.2 | 26.3 | 14.4 |
| 4 | Godo | 51.3 | 19.2 | 4.9 | 6.4 | 19.9 | 44.5 |
| 5 | Shirfa | 1.6 | 0.5 | 3.7 | 5.0 | 2.0 | 6.3 |
| 6 | Wala | 0.0 | 0.1 | 0.1 | 0.0 | 0.6 | 2.8 |
| 7 | Maeken | 0.1 | 1.9 | 1.2 | 6.1 | 0.0 | 0.4 |
| 8 | pit | 0.1 | 0.0 | 2.9 | 0.5 | 0.3 | 0.0 |
| 9 | Pot | 0.0 | 0.1 | 0.0 | 0.5 | 0.0 | 0.1 |
| 10 | Others | 2.4 | 2.4 | 3.8 | 0.7 | 7.5 | 14.0 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.46. Type of post-harvest traditional control measures

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=37) | Eastern (N=12) | Southern (N=137) | South E (N=450) | Western (N=214) | North W (N=752) |
| 1 | Ash | 0.0 | 0.0 | 8.0 | 2.7 | 8.4 | 9.7 |
| 2 | Botanicals | 81.1 | 83.3 | 1.5 | 1.1 | 0.5 | 1.1 |
| 3 | Don’t use | 16.2 | 8.3 | 65.7 | 86.0 | 77.1 | 77.9 |
| 4 | Others | 2.7 | 8.3 | 24.8 | 10.2 | 14.0 | 11.3 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.47. Type of post-harvest chemical control measures

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=1128) | Eastern (N=401) | Southern (N=137) | South E (N=450) | Western (N=214) | North W (N=752) |
| 1 | Dust (e.g., actellic) | 12.8 | 6.0 | 9.5 | 4.0 | 16.4 | 18.2 |
| 2 | Fumigant (tablet) | 2.7 | 1.2 | 5.1 | 0.7 | 9.8 | 6.4 |
| 3 | Don’t use | 78.9 | 88.5 | 62.8 | 88.0 | 60.7 | 68.0 |
| 4 | Others | 5.7 | 4.2 | 22.6 | 7.3 | 13.1 | 7.4 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.48. Causes of crop post-harvest losses

| No. | Causes of crop losses | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=437) | Eastern (N=20) | Southern (N=7) | South E (N=58) | Western (N=64) | North W (N=183) |
| 1 | Fungus | 1.1 | | 14.3 | 1.7 | 3.1 | 0.5 |
| 2 | Weevil | 38.7 | | 42.9 | 13.8 | 73.4 | 59.6 |
| 3 | Rodents | 36.8 | 45.0 | 42.9 | 48.3 | 10.9 | 33.3 |
| 4 | Theft | 1.8 | 5.0 | | 1.7 | 1.6 | 0.5 |
| 5 | Termites | 4.1 | 10.0 | | 1.7 | 9.4 | 4.4 |
| 6 | Lack of care | 5.3 | 5.0 | | 8.6 | 1.6 | 1.6 |
| 7 | Others | 2.7 | | | 15.5 | | |
| 8 | 2 & 3 | 5.7 | 30.0 | | | | |
| 9 | 3 & 5 | 3.7 | 5.0 | | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.49. Response to whether households had been affected by drought in the last five years

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=2191) | Eastern (N=1673) | Southern (N=1273) | South E (N=775) | Western (N=741) | North W (N=1481) |
| 1 | Yes | 64.8 | 70.6 | 72.7 | 82.1 | 35.2 | 50.8 |
| 2 | No | 35.2 | 29.4 | 27.3 | 17.9 | 64.8 | 49.2 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.50. Response to whether households got help during the drought period

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=1418) | Eastern (N=1181) | Southern (N=924) | South E (N=636) | Western (N=260) | North W (N=726) |
| 1 | Yes | 53.2 | 59.2 | 78.9 | 86.0 | 21.5 | 23.6 |
| 2 | No | 46.8 | 40.8 | 21.1 | 14.0 | 78.5 | 76.4 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.51. Distribution of donors

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=752) | Eastern (N=699) | Southern (N=728) | South E (N=545) | Western (N=56) | North W (N=171) |
| 1 | Government | 81.6 | 83.0 | 86.5 | 90.5 | 85.7 | 91.2 |
| 2 | NGOs | 1.1 | 0.4 | 0.4 | 0.2 | 3.6 | 1.2 |
| 3 | Relatives | 3.5 | 1.6 | 1.4 | 0.6 | 5.4 | 3.5 |
| 4 | Others | 0.7 | 0.3 | 0.5 | 0.4 | | 2.3 |
| 5 | 1 & 3 | 7.3 | 8.2 | 5.8 | 4.8 | 1.8 | 1.8 |
| 6 | 2 & 3 | 0.7 | 0.3 | 0.0 | 0.0 | 1.8 | |
| 7 | 1 & 2 | 2.7 | 4.0 | 3.2 | 0.4 | | |
| 8 | 1, 2 & 3 | 2.5 | 2.3 | 2.2 | 3.3 | 1.8 | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.52. Number of times of drought occurrence in the last five years

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=1420) | Eastern (N=1181) | Southern (N=925) | South E (N=636) | Western (N=261) | North W (N=729) |
| 1 | Once | 38.8 | 32.9 | 44.0 | 31.4 | 60.9 | 60.2 |
| 2 | Twice | 38.2 | 36.0 | 30.8 | 39.0 | 22.2 | 24.8 |
| 3 | More than twice | 22.5 | 30.7 | 24.9 | 28.9 | 14.9 | 14.3 |
| 4 | It didn't occur | 0.6 | 0.3 | 0.3 | 0.6 | 1.9 | 0.7 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.53. Response about causes of famine

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=1195) | Eastern (N=727) | Southern (N=428) | South E (N=529) | Western (N=203) | North W (N=698) |
| 1 | Curse of God | 40.3 | 40.6 | 58.4 | 56.0 | 62.1 | 59.0 |
| 2 | Environmental degradation | 9.3 | 7.7 | 18.5 | 18.0 | 12.8 | 16.5 |
| 3 | Over population | 2.2 | 3.3 | 3.5 | 0.4 | 1.0 | 0.1 |
| 4 | Others | 2.0 | 2.6 | 1.9 | 1.3 | 3.9 | 5.3 |
| 5 | 1 &3 | 1.4 | 1.1 | 0.2 | 1.3 | 0.0 | 0.4 |
| 6 | 2 & 3 | 4.6 | 4.8 | 4.4 | 15.5 | 2.5 | 1.4 |
| 7 | 1 & 2 | 30.8 | 28.5 | 9.1 | 4.9 | 16.7 | 15.2 |
| 8 | 1, 2 & 3 | 9.5 | 11.4 | 4.0 | | 1.0 | 2.0 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.54. Distribution of households to suggestions in overcoming drought

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=1418) | Eastern (N=1176) | Southern (N=909) | South E (N=629) | Western (N=260) | North W (N=729) |
| 1 | Pray to God | 32.2 | 35.0 | 35.8 | 39.7 | 50.0 | 52.5 |
| 2 | Environmental (forest, water, land etc) protection | 11.1 | 10.8 | 31.9 | 25.1 | 19.6 | 15.9 |
| 3 | Reduce population growth | 1.3 | 2.0 | 0.6 | 0.3 | 0.4 | 0.1 |
| 4 | Others | 0.3 | 0.1 | 0.7 | 1.0 | 3.5 | 1.5 |
| 5 | 1 & 3 | 2.0 | 1.3 | 0.8 | 0.6 | 0.4 | |
| 6 | 2 & 3 | 3.5 | 3.8 | 2.1 | 1.1 | 0.4 | 1.6 |
| 7 | 1 & 2 | 41.0 | 36.9 | 24.5 | 28.0 | 21.5 | 25.1 |
| 8 | 1, 2 & 3 | 8.7 | 10.1 | 3.7 | 4.1 | 4.2 | 3.2 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.55. Response of households to continuation of drought in the future

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=2191) | Eastern (N=1673) | Southern (N=1273) | South E (N=775) | Western (N=740) | North W (N=1480) |
| 1 | Yes | 3.2 | 3.2 | 10.4 | 8.4 | 3.2 | 5.1 |
| 2 | No | 6.7 | 7.2 | 12.1 | 8.9 | 11.6 | 7.8 |
| 3 | God knows | 82.3 | 78.1 | 54.0 | 62.6 | 71.6 | 76.3 |
| 4 | I don't know | 7.8 | 11.5 | 23.5 | 20.1 | 13.5 | 10.8 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix x Table 3.3.56. Response of households on where to get trees for construction

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=1687) | Eastern (N=1185) | Southern (N=1124) | South E (N=678) | Western (N=567) | North W (N=1213) |
| 1 | Own plantation | 24.1 | 36.3 | 22.6 | 15.5 | 15.3 | 20.0 |
| 2 | Community forest | 4.0 | 2.0 | 6.0 | 2.2 | 19.4 | 16.3 |
| 3 | State forest/enclosure | 1.9 | 1.1 | 2.5 | 0.4 | 5.3 | 4.5 |
| 4 | Market | 38.3 | 28.1 | 50.7 | 58.7 | 33.5 | 26.3 |
| 5 | Don't use | 10.7 | 8.9 | 6.5 | 13.4 | 7.4 | 6.3 |
| 6 | Others | 1.4 | 1.4 | 2.2 | 1.3 | 1.4 | 1.7 |
| 7 | 1 & 4 | 9.8 | 16.1 | 6.9 | 4.7 | 3.9 | 7.7 |
| 8 | 2 & 4 | 4.3 | 2.2 | 0.7 | 1.0 | 5.8 | 5.2 |
| 9 | 3 & 4 | 1.5 | 0.2 | 0.6 | 1.3 | 0.9 | 1.4 |
| 10 | 1 & 3 | 0.5 | 0.5 | 0.2 | 0.1 | 0.5 | 0.8 |
| 11 | 2 & 3 | 0.6 | 0.3 | 0.4 | 0.1 | 0.9 | 0.7 |
| 12 | 1 & 2 | 1.5 | 2.0 | 0.4 | 0.7 | 4.2 | 6.4 |
| 13 | 1, 2 & 4 | 1.3 | 0.9 | 0.3 | 0.3 | 1.4 | 2.6 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.57. Distribution of households response on source of seedlings

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=1689) | Eastern (N=1153) | Southern (N=1110) | South E (N=669) | Western (N=562) | North W (N=1212) |
| 1 | Government | 12.7 | 15.9 | 22.3 | 14.1 | 37.5 | 43.9 |
| 2 | NGO's | 0.3 | 0.2 | 0.5 | 0.4 | 0.4 | 1.0 |
| 3 | Own nursery | 1.7 | 1.7 | 2.3 | 0.6 | 3.4 | 3.2 |
| 4 | Market | 8.3 | 7.5 | 12.4 | 14.6 | 6.4 | 4.0 |
| 5 | Nursery | 31.1 | 35.6 | 29.0 | 25.7 | 14.2 | 16.1 |
| 6 | Don't use | 33.4 | 23.0 | 24.3 | 39.0 | 31.5 | 24.8 |
| 7 | Others | 1.5 | 1.9 | 2.8 | 0.4 | 2.3 | 1.5 |
| 8 | 1 & 5 | 6.6 | 7.2 | 2.5 | 1.3 | 1.6 | 3.4 |
| 9 | 4 & 5 | 2.6 | 4.6 | 2.4 | 3.4 | 0.7 | 1.1 |
| 10 | 1 & 4 | 1.8 | 2.5 | 1.4 | 0.3 | 2.0 | 1.1 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.58. Response of households on planting more if seedlings are available

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=1741) | Eastern (N=1193) | Southern (N=1138) | South E (N=687) | Western (N=573) | North W (N=1234) |
| 1 | Yes | 38.7 | 40.5 | 50.7 | 34.1 | 55.1 | 58.6 |
| 2 | No | 61.3 | 59.5 | 49.3 | 65.9 | 44.9 | 41.4 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.59. Distribution of the required number of seedlings to plant more

| No. | Number of seedlings | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=668) | Eastern (N=481) | Southern (N=577) | South E (N=234) | Western (N=315) | North W (N=722) |
| 1 | <10 | 9.6 | 10.2 | 5.7 | 9.0 | 20.6 | 15.0 |
| 2 | 10-100 | 72.2 | 66.7 | 59.8 | 69.2 | 69.8 | 72.0 |
| 3 | 101-500 | 14.4 | 19.5 | 27.9 | 19.7 | 8.3 | 11.2 |
| 4 | 501-1000 | 2.5 | 2.7 | 4.5 | 1.3 | 1.0 | 1.2 |
| 5 | >1000 | 1.3 | 0.8 | 2.1 | 0.9 | 0.3 | 0.6 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.60. Response of households on not wanting more seedlings

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=638) | Eastern (N=462) | Southern (N=555) | South E (N=220) | Western (N=308) | North W (N=711) |
| 1 | Shortage of land | 24.8 | 24.7 | 18.2 | 20.5 | 13.6 | 15.3 |
| 2 | Shortage of labour | 1.7 | 1.3 | 1.4 | 2.3 | 0.6 | 2.1 |
| 3 | Shortage of time | 0.2 | 0.6 | 0.5 | 0.0 | 3.2 | 1.7 |
| 4 | Shortage of water | 6.4 | 8.7 | 6.7 | 3.6 | 4.2 | 5.9 |
| 5 | Others | 41.8 | 48.1 | 69.0 | 68.6 | 76.0 | 71.9 |
| 6 | 1 & 4 | 10.5 | 6.9 | 2.7 | 3.2 | 1.9 | 1.4 |
| 7 | 1 & 2 | 7.1 | 4.5 | 1.1 | 0.9 | 0.3 | 1.4 |
| 8 | 1, 2 & 3 | 7.5 | 5.2 | 0.4 | 0.9 | | 0.3 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.61. Response of households on participation in different programs

| No. | Programme | Participation | |
|---|---|---|---|
| | | No. | % |
| I. | Central | | |
| 1 | Terracing | 373 | 24 |
| 2 | Plant seedlings | 29 | 1.9 |
| 3 | Development of ditch spring | 2 | 0.1 |
| 4 | Construction of dams | 52 | 3.3 |
| 5 | Construction of roads | 12 | 0.8 |
| 6 | Others | 230 | 14.8 |
| 7 | 1 & 5 | 29 | 1.9 |
| 8 | 1 & 4 | 154 | 9.9 |
| 9 | 1 & 3 | | 0.0 |
| 10 | 1 & 2 | 87 | 5.6 |
| 11 | 1, 4 & 5 | 76 | 4.9 |
| 12 | 1, 2 & 5 | | 0.0 |
| 13 | 1, 2 & 4 | 59 | 3.8 |
| 14 | 1, 2 & 3 | 81 | 5.2 |
| 15 | 1, 2, 4 & 5 | 50 | 3.2 |
| 16 | 1, 2, 3 & 4 | 132 | 8.5 |
| 17 | 1, 2, 3, 4, & 5 | 188 | 12.1 |
| | Total | | |
| II. | Eastern | | |
| 1 | Terracing | 211 | 19.6 |
| 2 | Plant seedlings | 35 | 3.3 |
| 3 | Development of ditch spring | 10 | 0.9 |
| 4 | Construction of dams | 67 | 6.2 |
| 5 | Construction of roads | 4 | 0.4 |
| 6 | Others | 205 | 19.1 |
| 7 | 1 & 5 | | |

| | | | |
|---|---|---|---|
| 8 | 1 & 4 | 87 | 8.1 |
| 9 | 1 & 3 | | |
| 10 | 1 & 2 | 74 | 6.9 |
| 11 | 1, 4 & 5 | 45 | 4.2 |
| 12 | 1, 2 & 5 | 22 | 2.0 |
| 13 | 1, 2 & 4 | 57 | 5.3 |
| 14 | 1, 2 & 3 | 34 | 3.2 |
| 15 | 1, 2, 4 & 5 | 40 | 3.7 |
| 16 | 1, 2, 3 & 4 | 61 | 5.7 |
| 17 | 1, 2, 3, 4, & 5 | 123 | 11.4 |
| | Total | | |
| III. North Western | | | |
| 1 | Terracing | 580 | 49.4 |
| 2 | Plant seedlings | 19 | 1.6 |
| 3 | Development of ditch spring | 4 | 0.3 |
| 4 | Construction of dams | 105 | 8.9 |
| 5 | Construction of roads | 16 | 1.4 |
| 6 | Others | 93 | 7.9 |
| 7 | 1 & 5 | 21 | 1.8 |
| 8 | 1 & 4 | 94 | 8.0 |
| 9 | 1 & 3 | 23 | 2.0 |
| 10 | 1 & 2 | 121 | 10.3 |
| 11 | 1, 4 & 5 | 11 | 0.9 |
| 12 | 1, 2 & 5 | | |
| 13 | 1, 2 & 4 | 29 | 2.5 |
| 14 | 1, 2 & 3 | 15 | 1.3 |
| 15 | 1, 2, 4 & 5 | | |
| 16 | 1, 2, 3 & 4 | 19 | 1.6 |
| 17 | 1, 2, 3, 4, & 5 | 25 | 2.1 |
| | Total | | |
| IV. Southern | | | |
| 1 | Terracing | 467 | 43.2 |
| 2 | Plant seedlings | 9 | 0.8 |
| 3 | Development of ditch spring | 10 | 0.9 |
| 4 | Construction of dams | 46 | 4.3 |
| 5 | Construction of roads | 17 | 1.6 |
| 6 | Others | 109 | 10.1 |
| 7 | 1 & 5 | 28 | 2.6 |
| 8 | 1 & 4 | 75 | 6.9 |
| 9 | 1 & 3 | 20 | 1.9 |
| 10 | 1 & 2 | 82 | 7.6 |
| 11 | 1, 4 & 5 | 23 | 2.1 |
| 12 | 1, 2 & 5 | 45 | 4.2 |
| 13 | 1, 2 & 4 | 34 | 3.1 |
| 14 | 1, 2 & 3 | 15 | 1.4 |
| 15 | 1, 2, 4 & 5 | 35 | 3.2 |

| | | | |
|---|---|---|---|
| 16 | 1, 2, 3 & 4 | 9 | 0.8 |
| 17 | 1, 2, 3, 4, & 5 | 57 | 5.3 |
| | Total | | |
| V. South Eastern | | | |
| 1 | Terracing | 256 | 40.0 |
| 2 | Plant seedlings | 6 | 0.9 |
| 3 | Development of ditch spring | 6 | 0.9 |
| 4 | Construction of dams | 23 | 3.6 |
| 5 | Construction of roads | 10 | 1.6 |
| 6 | Others | 81 | 12.7 |
| 7 | 1 & 5 | 6 | 0.9 |
| 8 | 1 & 4 | 65 | 10.2 |
| 9 | 1 & 3 | 11 | 1.7 |
| 10 | 1 & 2 | 50 | 7.8 |
| 11 | 1, 4 & 5 | 16 | 2.5 |
| 12 | 1, 2 & 5 | 16 | 2.5 |
| 13 | 1, 2 & 4 | 17 | 2.7 |
| 14 | 1, 2 & 3 | | |
| 15 | 1, 2, 4 & 5 | 10 | 1.6 |
| 16 | 1, 2, 3 & 4 | 6 | 0.9 |
| 17 | 1, 2, 3, 4, & 5 | 61 | 9.5 |
| | Total | | |
| VI. Western | | | |
| 1 | Terracing | 271 | 52.4 |
| 2 | Plant seedlings | 19 | 3.7 |
| 3 | Development of ditch spring | 1 | 0.2 |
| 4 | Construction of dams | 54 | 10.4 |
| 5 | Construction of roads | 16 | 3.1 |
| 6 | Others | 72 | 13.9 |
| 7 | 1 & 5 | 11 | 2.1 |
| 8 | 1 & 4 | 29 | 5.6 |
| 9 | 1 & 3 | | |
| 10 | 1 & 2 | 34 | 6.6 |
| 11 | 1, 4 & 5 | | |
| 12 | 1, 2 & 5 | | |
| 13 | 1, 2 & 4 | 10 | 1.9 |
| 14 | 1, 2 & 3 | | |
| 15 | 1, 2, 4 & 5 | | |
| 16 | 1, 2, 3 & 4 | | |
| 17 | 1, 2, 3, 4, & 5 | | |
| | Total | | |

Appendix Table 3.3.62. Response of households on importance of the development programs

| No. | Evaluation | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=1741) | Eastern (N=1193) | Southern (N=1138) | South E (N=687) | Western (738) | North W (N=1484) |
| 1 | Important | 88.7 | 88.2 | 92.8 | 92.4 | 71.4 | 79.3 |
| 2 | Not Important | 11.3 | 11.8 | 7.2 | 7.6 | 28.6 | 20.7 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.63. Response of households on organizer of the different programms

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=1738) | Eastern (N=1141) | Southern (N=1136) | South E (N=682) | Western (N=571) | North W (N=1224) |
| 1 | Government | 58.9 | 63.2 | 76.5 | 82.0 | 60.9 | 67.7 |
| 2 | NGO's | 0.3 | 0.8 | 0.3 | 0.3 | 0.0 | 0.2 |
| 3 | Community | 8.8 | 7.7 | 6.1 | 3.2 | 14.5 | 12.6 |
| 4 | Others | 10.1 | 9.9 | 4.0 | 4.3 | 8.9 | 3.3 |
| 5 | 1 & 3 | 17.8 | 17.9 | 10.5 | 9.4 | 15.2 | 15.8 |
| 6 | 2 & 3 | 0.0 | 0.2 | 0.1 | 0.0 | 0.2 | 0.1 |
| 7 | 1, 2 & 3 | 3.3 | 0.1 | 1.0 | 0.3 | 0.2 | 0.1 |
| 8 | 1 & 2 | 0.9 | 0.3 | 1.6 | 0.6 | 0.0 | 0.2 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.64. Response of households on practice of terracing on own farm

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=1741) | Eastern (N=1193) | Southern (N=1138) | South E (N=687) | Western (N=573) | North W (N=1234) |
| 1 | Yes | 73.1 | 66.1 | 72.2 | 76.0 | 54.6 | 79.3 |
| 2 | No | 26.9 | 33.9 | 27.8 | 24.0 | 45.4 | 20.7 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.65. Distribution of households by reason for not practicing terracing on own farm

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=454) | Eastern (N=384) | Southern (N=305) | South E (N=162) | Western (N=256) | North W (N=252) |
| 1 | Laborious | 16.1 | 18.2 | 15.7 | 18.5 | 12.5 | 13.1 |
| 2 | Hide out crop damaging rodents | 2.2 | 3.9 | 0.7 | 2.5 | 0.8 | 2.4 |
| 3 | Insufficiency of farmland | 22.0 | 20.3 | 15.4 | 14.2 | 7.8 | 15.9 |
| 4 | The farmland is plain | 22.5 | 25.5 | 44.9 | 32.7 | 59.4 | 46.4 |
| 5 | Others | 15.2 | 13.5 | 15.7 | 24.1 | 14.5 | 17.9 |
| 6 | 1 & 4 | 1.5 | 1.8 | 2.0 | 2.5 | 1.2 | 0.8 |
| 7 | 3 & 4 | 4.4 | 6.5 | 3.9 | 1.9 | 2.0 | 2.8 |
| 8 | 1 & 3 | 3.1 | 3.1 | 1.0 | 3.7 | 0.4 | 0.8 |
| 9 | 2 & 3 | 6.6 | 3.6 | 0.7 | | 0.0 | |
| 10 | 1 & 2 | 4.2 | 1.6 | 0.0 | | 1.6 | |
| 11 | 1, 2 & 3 | 2.2 | 1.8 | 0.0 | | | |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.66. Response of householders to how long (mo) they have enough food

| No. | Response | Response of HOUSEHOLD (%) within Administrative zones | | | | | |
|---|---|---|---|---|---|---|---|
| | | Central (N=2189) | Eastern (N=1672) | Southern (N=1273) | South E (N=774) | Western (N=740) | North W (N=1480) |
| 1 | None | 1.3 | 1.7 | 0.8 | 0.1 | 0.8 | 0.7 |
| 2 | 1-2 months | 4.4 | 6.9 | 0.9 | 1.9 | 1.6 | 1.8 |
| 3 | 3-4 months | 11.3 | 15.8 | 7.4 | 8.5 | 3.2 | 4.3 |
| 4 | 5-6 months | 18.9 | 18.7 | 10.1 | 15.0 | 6.1 | 8.1 |
| 5 | 7-8 months | 15.6 | 15.0 | 18.0 | 18.9 | 9.9 | 12.8 |
| 6 | 9-10 months | 13.8 | 9.3 | 13.0 | 14.0 | 11.4 | 13.6 |
| 7 | >10 months | 31.8 | 32.5 | 49.9 | 41.6 | 67.0 | 58.6 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Appendix Table 3.3.67. Number of HOUSEHOLD by gender who responded to which months they had enough food

| Zone | Months | Male | Female | Total | % of female |
|---|---|---|---|---|---|
| Central | Sept | 775 | 279 | 1054 | 26.5 |
| | Oct. | 1147 | 396 | 1543 | 25.7 |
| | Nov | 1492 | 526 | 2018 | 26.1 |
| | Dec. | 1532 | 531 | 2063 | 25.7 |
| | Jan | 1480 | 506 | 1986 | 25.5 |
| | Feb | 1384 | 467 | 1851 | 25.2 |
| | March | 1248 | 398 | 1646 | 24.2 |
| | April | 1134 | 364 | 1498 | 24.3 |
| | May | 960 | 309 | 1269 | 24.3 |
| | June | 787 | 254 | 1041 | 24.4 |
| | July | 626 | 201 | 827 | 24.3 |
| | Aug | 570 | 189 | 759 | 24.9 |
| Eastern | | | | | |
| | Sept | 543 | 322 | 865 | 37.2 |
| | Oct. | 779 | 432 | 1211 | 35.7 |
| | Nov | 968 | 540 | 1508 | 35.8 |
| | Dec. | 970 | 536 | 1506 | 35.6 |
| | Jan | 905 | 512 | 1417 | 36.1 |
| | Feb | 815 | 446 | 1261 | 35.4 |
| | March | 715 | 405 | 1120 | 36.2 |
| | April | 629 | 361 | 990 | 36.5 |
| | May | 547 | 321 | 868 | 37.0 |
| | June | 466 | 281 | 747 | 37.6 |
| | July | 411 | 254 | 665 | 38.2 |
| | Aug | 386 | 245 | 631 | 38.8 |
| Southern | | | | | |
| | Sept | 572 | 189 | 761 | 24.8 |
| | Oct. | 714 | 263 | 977 | 26.9 |
| | Nov | 858 | 344 | 1202 | 28.6 |
| | Dec. | 877 | 358 | 1235 | 29.0 |
| | Jan | 874 | 352 | 1226 | 28.7 |
| | Feb | 841 | 334 | 1175 | 28.4 |
| | March | 813 | 320 | 1133 | 28.2 |
| | April | 783 | 287 | 1070 | 26.8 |
| | May | 710 | 252 | 962 | 26.2 |
| | June | 637 | 218 | 855 | 25.5 |
| | July | 530 | 182 | 712 | 25.6 |
| | Aug | 513 | 172 | 685 | 25.1 |

| | | | | | |
|---|---|---|---|---|---|
| South Eastern | | | | | |
| | Sept | 314 | 97 | 411 | 23.6 |
| | Oct. | 395 | 139 | 534 | 26.0 |
| | Nov | 501 | 214 | 715 | 29.9 |
| | Dec. | 517 | 225 | 742 | 30.3 |
| | Jan | 511 | 221 | 732 | 30.2 |
| | Feb | 493 | 210 | 703 | 29.9 |
| | March | 471 | 191 | 662 | 28.9 |
| | April | 438 | 173 | 611 | 28.3 |
| | May | 398 | 141 | 539 | 26.2 |
| | June | 359 | 110 | 469 | 23.5 |
| | July | 288 | 91 | 379 | 24.0 |
| | Aug | 267 | 83 | 350 | 23.7 |
| Western | | | | | |
| | Sept | 465 | 118 | 583 | 20.2 |
| | Oct. | 480 | 129 | 609 | 21.2 |
| | Nov | 538 | 142 | 680 | 20.9 |
| | Dec. | 552 | 147 | 699 | 21.0 |
| | Jan | 548 | 146 | 694 | 21.0 |
| | Feb | 534 | 142 | 676 | 21.0 |
| | March | 533 | 135 | 668 | 20.2 |
| | April | 517 | 130 | 647 | 20.1 |
| | May | 496 | 122 | 618 | 19.7 |
| | June | 475 | 114 | 589 | 19.4 |
| | July | 438 | 103 | 541 | 19.0 |
| | Aug | 431 | 101 | 532 | 19.0 |
| North Western | | | | | |
| | Sept | 844 | 232 | 1076 | 21.6 |
| | Oct. | 938 | 275 | 1213 | 22.7 |
| | Nov | 1058 | 331 | 1389 | 23.8 |
| | Dec. | 1079 | 338 | 1417 | 23.9 |
| | Jan | 1077 | 336 | 1413 | 23.8 |
| | Feb | 1051 | 328 | 1379 | 23.8 |
| | March | 1021 | 312 | 1333 | 23.4 |
| | April | 992 | 289 | 1281 | 22.6 |
| | May | 923 | 261 | 1184 | 22.0 |
| | June | 854 | 233 | 1087 | 21.4 |
| | July | 757 | 194 | 951 | 20.4 |
| | Aug | 725 | 188 | 913 | 20.6 |

Appendix Table 3.3.68. Response of householders to the coping mechanisms they implement during shortages of food

| No. | | Central | | Eastern | | Southern | | South Eastern | | Western | | North W | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coping mechanisms | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No |
| 1 | Eating food which is not consumed normally | 1 | 0.0 | | 0.0 | 103 | 7.4 | 81 | 8.3 | | 0.0 | | 0.0 |
| 2 | Eat less preferred food | 252 | 9.9 | 208 | 11.1 | 182 | 13.1 | 111 | 11.3 | 24 | 9.3 | 33 | 5.4 |
| 3 | Looking for off farm activities | 214 | 8.4 | 128 | 6.8 | 146 | 10.5 | 120 | 12.3 | 28 | 10.8 | 64 | 10.5 |
| 4 | Borrow grain and//or cash | 298 | 11.7 | 205 | 10.9 | 157 | 11.3 | 111 | 11.3 | 40 | 15.4 | 101 | 16.5 |
| 5 | Eat less food in a day | 406 | 16.0 | 303 | 16.1 | 177 | 12.8 | 109 | 11.1 | 47 | 18.1 | 97 | 15.9 |
| 6 | Eat less food per meal | 410 | 16.1 | 299 | 15.9 | 158 | 11.4 | 99 | 10.1 | 50 | 19.3 | 106 | 17.3 |
| 7 | Sell livestock | 394 | 15.5 | 209 | 11.1 | 180 | 13.0 | 110 | 11.2 | 45 | 17.4 | 115 | 18.8 |
| 8 | Sell household utensils | 16 | 0.6 | 8 | 0.4 | 6 | 0.4 | 5 | 0.5 | 3 | 1.2 | 1 | 0.2 |
| 9 | Sell firewood | 36 | 1.4 | 30 | 1.6 | 18 | 1.3 | 4 | 0.4 | 3 | 1.2 | 9 | 1.5 |
| 10 | Making & selling charcoals | 25 | 1.0 | 22 | 1.2 | 5 | 0.4 | 2 | 0.2 | 5 | 1.9 | 10 | 1.6 |
| 11 | Rent out land | 29 | 1.1 | 17 | 0.9 | 12 | 0.9 | 7 | 0.7 | 6 | 2.3 | 12 | 2.0 |
| 12 | Withdraw children from school | 14 | 0.6 | 10 | 0.5 | 2 | 0.1 | 2 | 0.2 | 1 | 0.4 | 11 | 1.8 |
| 13 | Selling of jewellery | 9 | 0.4 | 11 | 0.6 | 6 | 0.4 | 10 | 1.0 | | 0.0 | 2 | 0.3 |
| 14 | Distressed migration | 51 | 2.0 | 32 | 1.7 | 2 | 0.1 | 5 | 0.5 | 1 | 0.4 | 4 | 0.7 |
| 15 | Relief aid | 388 | 15.3 | 398 | 21.2 | 233 | 16.8 | 203 | 20.7 | 6 | 2.3 | 46 | 7.5 |
| | Total | 2543 | | 1880 | | 1387 | | 979 | | 259 | | 611 | |

Appendix Table 3.3.63. Proportion of households engaged in livestock rearing in Tigray by zone (N = 12316 HOUSEHOLDs) (% of HOUSEHOLDs)

| Category | Sex of HOUSEHOLDs | Regional | | Southern | | South east | | Eastern | | Central | | North west | | Western | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No |
| Urban | Male | 14.52 | 85.48 | 22.48 | 77.52 | 6.06 | 93.94 | 18.33 | 81.67 | 16.20 | 83.80 | 18.46 | 81.54 | 27.78 | 72.22 |
| | Female | 7.48 | 92.52 | 10.15 | 89.85 | 2.81 | 97.19 | 12.09 | 87.91 | 8.09 | 91.91 | 4.97 | 95.03 | 26.37 | 73.63 |
| | Total | 11.47 | 88.53 | 16.42 | 83.58 | 4.62 | 95.38 | 15.45 | 84.55 | 13.07 | 86.93 | 13.36 | 86.64 | 27.23 | 72.77 |
| Infant town | Male | 57.09 | 42.91 | 65.09 | 34.91 | 62.07 | 37.93 | 43.60 | 56.40 | 30.59 | 69.41 | 81.08 | 18.92 | 70.00 | 30.00 |
| | Female | 25.93 | 74.07 | 33.77 | 66.23 | 26.47 | 73.53 | 19.62 | 80.38 | 17.12 | 82.88 | 35.63 | 64.37 | 42.65 | 57.35 |
| | Total | 45.61 | 54.39 | 51.91 | 48.09 | 48.91 | 51.09 | 32.68 | 67.32 | 25.21 | 74.79 | 68.28 | 31.72 | 63.31 | 36.69 |
| Rural | Male | 82.92 | 17.08 | 82.47 | 17.53 | 76.45 | 23.55 | 84.50 | 15.50 | 84.19 | 15.81 | 85.71 | 14.29 | 77.24 | 22.76 |
| | Female | 51.18 | 48.82 | 44.78 | 55.22 | 42.51 | 57.49 | 52.37 | 47.63 | 53.86 | 46.14 | 60.00 | 40.00 | 47.31 | 52.69 |
| | Total | 74.54 | 25.46 | 72.20 | 27.80 | 66.28 | 33.72 | 73.89 | 26.11 | 77.10 | 22.90 | 79.68 | 20.32 | 71.21 | 28.79 |

N = Total number of respondents; HOUSEHOLDs = Households; n = Number of respondents

Appendix Table 3.3.64. Purpose of animal production as per the interviewed farmers in rural and infant towns of Tigray (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)

| Purpose of animal raising | Cattle | | | Sheep | | | Goat | | | Donkey | | | Chicken | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | Rank | n | % | Rank | n | % | Rank | n | % | Rank | n | % | Rank |
| Draft | 4465 | 92 | 1 | - | - | - | - | - | - | 2038 | 82 | 1 | - | - | - |
| Meat | 1638 | 34 | 6 | 1,352 | 96 | 1 | 1578 | 97 | 2 | - | - | - | 2386 | 92 | 2 |
| Milk | 2668 | 55 | 4 | 337 | 24 | 7 | 549 | 34 | 7 | - | - | - | - | - | - |
| Egg | - | - | - | - | - | - | - | - | - | - | - | - | 2584 | 100 | 1 |
| Income/sale | 2940 | 61 | 2 | 1,227 | 87 | 2 | 1621 | 100 | 1 | 1009 | 40 | 3 | 2203 | 85 | 3 |
| Saving | 614 | 13 | 9 | 157 | 11 | 8 | 318 | 20 | 8 | 267 | 11 | 6 | 370 | 14 | 7 |
| Breeding | 2475 | 51 | 5 | 615 | 44 | 4 | 1404 | 87 | 3 | 751 | 30 | 4 | 1729 | 67 | 4 |
| Manure | 2864 | 59 | 3 | 736 | 52 | 3 | 1,215 | 75 | 4 | 1,125 | 45 | 2 | 558 | 22 | 6 |
| Hide/skin | 1253 | 26 | 8 | 475 | 34 | 6 | 601 | 37 | 6 | - | - | - | - | - | - |
| Wealth | 1421 | 29 | 7 | 565 | 40 | 5 | 772 | 48 | 5 | 820 | 33 | 5 | 906 | 35 | 5 |
| Gift | 58 | 1 | 10 | 73 | 5 | 9 | 110 | 7 | 9 | 100 | 4 | 7 | 148 | 6 | 8 |
| Compensation | 7 | 0 | 11 | 9 | 1 | 10 | 25 | 2 | 10 | 32 | 1 | 8 | 17 | 1 | 9 |
| Other (N) | 4840 | - | - | 1404 | - | - | 1621 | 100 | - | 2492 | 100 | - | 2584 | 100 | - |

N = Total number of respondents; HOUSEHOLDs = Households; n = Number of respondents

Appendix Table 3.3.65. Land availability for livestock production in urban areas of Tigray region (N = 478 HOUSEHOLDs) (% of HOUSEHOLDs)

| Zone | Land availability for livestock farming | | | | Livestock holders |
|---|---|---|---|---|---|
| | No land | | Have land | | |
| | Number | Percent | Number | Percent | |
| Southern | 17 | 15 | 95 | 85 | 112 |
| Mekelle | 9 | 12 | 65 | 88 | 74 |
| Eastern | 8 | 11 | 64 | 89 | 72 |
| Central | 14 | 15 | 78 | 85 | 92 |
| Western | 3 | 5 | 61 | 95 | 64 |
| North west | 5 | 8 | 59 | 92 | 64 |
| Total (N) | 56 | 12 | 422 | 88 | 478 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.66. The average, minimum and maximum livestock farm size holding (m2/HOUSEHOLD) in urban areas of Tigray (N = 478 HOUSEHOLDs)

| Zone | Average | Minimum | Maximum |
|---|---|---|---|
| Southern | 131.59 | 0 | 2500 |
| Mekelle | 72.25 | 0 | 350 |
| Eastern | 19.98 | 0 | 350 |
| Central | 261.22 | 0 | 100 |
| Western | 78.47 | 0 | 10000 |
| North west | 202.21 | 0 | 400 |
| Overall | 127.62 | 0 | 10000 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.67. Livestock holding by type among households in Tigray by zone (N= 6060 HOUSEHOLDs) (% of HOUSEHOLDs)

| Animal | Southern | | | South east | | | Eastern | | | Central | | | North west | | | Western | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| type | Urb | IT | Rur | Urb | IT | Rur | Urb | IT | Rur | Urb | IT | Rur | Urb | IT | Rur | Urb | IT | Rur |
| Cattle | 58.04 | 80.00 | 89.07 | 59.46 | 73.33 | 86.30 | 40.28 | 68.00 | 83.17 | 45.65 | 60.87 | 88.91 | 68.75 | 89.57 | 91.43 | 20.31 | 73.86 | 93.01 |
| Sheep | 33.93 | 22.11 | 31.00 | 12.16 | 15.56 | 16.52 | 40.28 | 30.67 | 40.58 | 31.52 | 32.61 | 25.73 | 9.38 | 14.69 | 13.83 | 73.44 | 28.98 | 13.07 |
| Goats | 4.46 | 9.47 | 16.14 | 2.70 | 17.78 | 17.61 | 1.39 | 5.33 | 16.28 | 9.78 | 10.87 | 39.94 | 9.38 | 46.45 | 40.94 | 18.75 | 32.95 | 40.12 |
| Donkeys | 6.25 | 28.42 | 34.94 | 17.57 | 46.67 | 58.48 | 1.39 | 28.00 | 48.72 | 15.22 | 33.70 | 42.36 | 28.13 | 55.92 | 49.62 | 17.19 | 42.61 | 41.95 |
| Horses | 3.57 | 1.05 | 0.38 | 5.41 | 2.22 | 1.09 | 2.78 | 2.00 | 0.22 | 2.17 | 1.09 | 0.07 | 0.00 | 0.95 | 0.11 | 0.00 | 1.14 | 0.30 |
| Mules | 0.00 | 3.16 | 3.05 | 0.00 | 0.00 | 0.43 | 0.00 | 1.33 | 0.11 | 1.09 | 0.00 | 0.28 | 0.00 | 0.00 | 0.11 | 0.00 | 0.00 | 0.30 |
| Camels | 0.00 | 1.05 | 1.65 | 0.00 | 0.00 | 0.65 | 0.00 | 0.00 | 0.11 | 0.00 | 1.09 | 2.56 | 6.25 | 14.22 | 7.93 | 0.00 | 1.14 | 5.17 |
| Chickens | 17.86 | 29.47 | 31.26 | 33.78 | 46.67 | 47.61 | 55.56 | 39.33 | 43.37 | 50.00 | 32.61 | 45.42 | 23.44 | 59.24 | 62.27 | 42.19 | 48.30 | 49.24 |
| Pigs | 0.89 | 0.00 | 0.00 | 1.35 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Bee hive | 1.79 | 2.11 | 2.92 | 2.70 | 6.67 | 4.78 | 0.00 | 0.00 | 4.01 | 2.17 | 8.70 | 3.91 | 0.00 | 4.74 | 5.68 | 0.00 | 2.84 | 5.78 |

N = Total number of respondents; HOUSEHOLDs = Households; Urb= Urban; IT= Infant town; Rur= Rural

Appendix Table 3.3.68. Livestock herd size per household in infant towns and rural areas of Tigray by zone (N= 5582 HOUSEHOLDs)

| Animal type | Livestock herd size by administrative zone | | | | | | Overall | | TLU share |
|---|---|---|---|---|---|---|---|---|---|
| | Southern | South east | Eastern | Central | Western | North west | Number | TLU | (%) |
| Cattle | 3.20 | 2.63 | 1.62 | 1.81 | 6.65 | 5.30 | 3.22 | 2.48 | 73 |
| Bull | 0.22 | 0.19 | 0.12 | 0.18 | 0.65 | 0.56 | 0.29 | 0.17 | 5 |
| Oxen | 1.23 | 0.97 | 0.75 | 0.96 | 1.08 | 1.37 | 1.07 | 1.18 | 35 |
| Cows | 0.98 | 0.62 | 0.25 | 0.24 | 2.26 | 1.48 | 0.83 | 0.83 | 24 |
| Heifer | 0.29 | 0.21 | 0.09 | 0.09 | 1.11 | 0.75 | 0.36 | 0.18 | 5 |
| Calves | 0.45 | 0.49 | 0.39 | 0.32 | 1.52 | 1.13 | 0.64 | 0.13 | 4 |
| Sheep | 2.05 | 0.97 | 1.37 | 0.97 | 1.85 | 0.98 | 1.30 | 0.13 | 4 |
| Goats | 1.00 | 1.25 | 0.73 | 2.11 | 4.16 | 3.62 | 2.09 | 0.21 | 6 |
| Donkeys | 0.55 | 0.70 | 1.33 | 1.46 | 0.51 | 0.70 | 0.98 | 0.49 | 14 |
| Horses | 0.013 | 0.011 | 0.01 | 0.002 | 0.005 | 0.005 | 0.007 | 0.01 | 0 |
| Mules | 0.03 | 0.003 | 0.003 | 0.005 | 0.001 | 0.001 | 0.007 | 0.00 | 0 |
| Camels | 0.24 | 0.02 | 0.001 | 0.07 | 0.03 | 0.09 | 0.05 | 0.06 | 2 |
| Chickens | 1.88 | 2.77 | 1.29 | 1.42 | 3.00 | 5.22 | 2.52 | 0.03 | 1 |
| Pigs | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0 |
| Bee hive | 0.032 | 0.45 | 0.002 | 0.012 | 0.19 | 0.129 | 0.09 | - | 0 |
| Total | - | - | - | - | - | - | - | 3.41 | 100 |

N = Total number of respondents; HOUSEHOLDs = Households; TLU = Tropical Livestock Unit (An animal with 250 kg live weight)

Appendix Table 3.3.69. Livestock herd size per household in number in infant towns and rural areas of Tigray by zone (N= 5582 HOUSEHOLDs)

| Animal | Southern | | | South east | | | Eastern | | | Central | | | Western | | | North west | | | Overall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| type | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av |
| Cattle | 0 | 23 | 3.20 | 0 | 13 | 2.63 | 0 | 11 | 1.62 | 0 | 12 | 1.81 | 0 | 80 | 6.65 | 0 | 66 | 5.30 | 0 | 80 | 3.22 |
| Bull | 0 | 6 | 0.22 | 0 | 4 | 0.19 | 0 | 4 | 0.12 | 0 | 3 | 0.18 | 0 | 10 | 0.65 | 0 | 8 | 0.56 | 0 | 10 | 0.29 |
| Oxen | 0 | 6 | 1.23 | 0 | 10 | 0.97 | 0 | 4 | 0.75 | 0 | 4 | 0.96 | 0 | 10 | 1.08 | 0 | 40 | 1.37 | 0 | 40 | 1.07 |
| Cows | 0 | 10 | 0.98 | 0 | 4 | 0.62 | 0 | 5 | 0.25 | 0 | 10 | 0.24 | 0 | 40 | 2.26 | 0 | 35 | 1.48 | 0 | 40 | 0.83 |
| Heifer | 0 | 6 | 0.29 | 0 | 3 | 0.21 | 0 | 4 | 0.09 | 0 | 10 | 0.09 | 0 | 20 | 1.11 | 0 | 11 | 0.75 | 0 | 20 | 0.36 |
| Calves | 0 | 4 | 0.45 | 0 | 9 | 0.49 | 0 | 11 | 0.39 | 0 | 9 | 0.32 | 0 | 30 | 1.52 | 0 | 41 | 1.13 | 0 | 41 | 0.64 |
| Sheep | 0 | 43 | 2.05 | 0 | 29 | 0.97 | 0 | 34 | 1.37 | 0 | 23 | 0.97 | 0 | 80 | 1.85 | 0 | 51 | 0.98 | 0 | 80 | 1.30 |
| Goats | 0 | 30 | 1.00 | 0 | 30 | 1.25 | 0 | 32 | 0.73 | 0 | 122 | 2.11 | 0 | 100 | 4.16 | 0 | 54 | 3.62 | 0 | 122 | 2.09 |
| Donkeys | 0 | 10 | 0.55 | 0 | 4 | 0.70 | 0 | 60 | 1.33 | 0 | 30 | 1.46 | 0 | 4 | 0.51 | 0 | 14 | 0.70 | 0 | 60 | 0.98 |
| Horses | 0 | 6 | 0.013 | 0 | 1 | 0.011 | 0 | 6 | 0.01 | 0 | 2 | 0.002 | 0 | 1 | 0.005 | 0 | 4 | 0.005 | 0 | 6 | 0.007 |
| Mules | 0 | 2 | 0.03 | 0 | 1 | 0.003 | 0 | 2 | 0.003 | 0 | 5 | 0.005 | 0 | 1 | 0.001 | 0 | 1 | 0.001 | 0 | 5 | 0.007 |
| Camels | 0 | 5 | 0.24 | 0 | 5 | 0.02 | 0 | 2 | 0.001 | 0 | 16 | 0.07 | 0 | 2 | 0.03 | 0 | 2 | 0.09 | 0 | 16 | 0.05 |
| Chickens | 0 | 100 | 1.88 | 0 | 40 | 2.77 | 0 | 50 | 1.29 | 0 | 25 | 1.42 | 0 | 70 | 3.00 | 0 | 1500 | 5.22 | 0 | 1500 | 2.52 |
| Pig | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| Bee hive | 0 | 9 | 0.032 | 0 | 200 | 0.45 | 0 | 3 | 0.002 | 0 | 6 | 0.012 | 0 | 40 | 0.19 | 0 | 8 | 0.129 | 0 | 200 | 0.09 |
| Overall | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

N = Total number of respondents; HOUSEHOLDs = Households; Av= Average; Mn = Minimum; Mx= Maximum;

Appendix Table 3.3.70. Livestock herd size per household in number in urban areas of Tigray by zone (N= 478 HOUSEHOLDs)

| Animal | Southern | | | Mekelle | | | Eastern | | | Central | | | Western | | | North west | | | Overall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| type | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av |
| Cattle | 0 | 25 | 1.87 | 0 | 30 | 3.27 | 0 | 21 | 1.23 | 0 | 16 | 1.88 | 0 | 19 | 0.88 | 0 | 39 | 4.03 | 0 | 45 | 2.76 |
| Bull | 0 | 2 | 0.12 | 0 | 4 | 0.29 | 0 | 2 | 0.10 | 0 | 2 | 0.11 | 0 | 6 | 0.09 | 0 | 7 | 0.42 | 0 | 7 | 0.17 |
| Oxen | 0 | 2 | 0.51 | 0 | 5 | 0.54 | 0 | 4 | 0.12 | 0 | 3 | 0.31 | 0 | 2 | 0.16 | 0 | 10 | 0.85 | 0 | 10 | 0.41 |
| Cows | 0 | 9 | 0.65 | 0 | 15 | 1.63 | 0 | 11 | 0.76 | 0 | 5 | 0.87 | 0 | 6 | 0.42 | 0 | 10 | 1.77 | 0 | 15 | 1.60 |
| Heifer | 0 | 2 | 0.16 | 0 | 2 | 0.39 | 0 | 2 | 0.04 | 0 | 3 | 0.26 | 0 | 2 | 0.04 | 0 | 2 | 0.11 | 0 | 3 | 0.17 |
| Calves | 0 | 10 | 0.43 | 0 | 4 | 0.42 | 0 | 2 | 0.21 | 0 | 3 | 0.33 | 0 | 3 | 0.17 | 0 | 10 | 0.88 | 0 | 10 | 0.41 |
| Sheep | 0 | 20 | 2.39 | 0 | 25 | 1.31 | 0 | 12 | 2.45 | 0 | 15 | 2.44 | 0 | 100 | 6.81 | 0 | 8 | 0.54 | 0 | 100 | 2.74 |
| Goats | 0 | 7 | 0.17 | 0 | 20 | 0.32 | 0 | 8 | 0.11 | 0 | 20 | 0.75 | 0 | 10 | 0.70 | 0 | 20 | 0.97 | 0 | 20 | 0.50 |
| Donkeys | 0 | 4 | 0.14 | 0 | 5 | 0.31 | 0 | 2 | 0.02 | 0 | 3 | 0.22 | 0 | 2 | 0.21 | 0 | 1 | 0.31 | 0 | 5 | 0.20 |
| Horses | 0 | 1 | 0.03 | 0 | 1 | 0.06 | 0 | 1 | 0.02 | 0 | 1 | 0.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 1 | 0.03 |
| Mules | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 1 | 0.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 1 | 0.02 |
| Camels | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 1 | 0.06 | 0 | 1 | 0.01 |
| Chickens | 0 | 1500 | 15.46 | 0 | 300 | 6.83 | 0 | 100 | 8.69 | 0 | 50 | 4.96 | 0 | 15 | 5.47 | 0 | 60 | 2.07 | 0 | 1500 | 7.97 |
| Pig | 0 | 3 | 0.02 | 0 | 10 | 0.13 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 10 | 0.03 |
| Bee hive | 0 | 16 | 0.15 | 0 | 4 | 0.06 | 0 | 0 | 0.00 | 0 | 3 | 0.05 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 16 | 0.05 |
| Overall | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

N = Total number of respondents; HOUSEHOLDs = Households; Av= Average; Mn = Minimum; Mx= Maximum;

Appendix Table 3.3.71. Livestock herd size per household in Tropical Livestock Unit (TLU) in infant towns and rural areas of Tigray (N= 5582 HOUSEHOLDs)

| Animal type | Southern | | | South east | | | Eastern | | | Central | | | Western | | | North west | | | Overall | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | TLU share (%) |
| Cattle | 0 | 17.1 | 2.69 | 0 | 12.2 | 2.15 | 0 | 7.20 | 1.27 | 0 | 11.20 | 1.50 | 0 | 48.6 | 4.72 | 0 | 55.3 | 3.90 | 0 | 55.30 | 2.48 | 73 |
| Bull | 0 | 3.60 | 0.13 | 0 | 2.40 | 0.11 | 0 | 2.40 | 0.07 | 0 | 1.80 | 0.10 | 0 | 6.00 | 0.39 | 0 | 4.80 | 0.33 | 0 | 6.00 | 0.17 | 5 |
| Oxen | 0 | 6.60 | 1.35 | 0 | 11.00 | 1.22 | 0 | 4.40 | 0.83 | 0 | 4.40 | 1.06 | 0 | 11.00 | 1.20 | 0 | 44.00 | 1.50 | 0 | 44.00 | 1.18 | 35 |
| Cows | 0 | 10.00 | 0.98 | 0 | 4.00 | 0.62 | 0 | 5.00 | 0.25 | 0 | 10.00 | 0.24 | 0 | 40.00 | 2.27 | 0 | 35.00 | 1.48 | 0 | 40.00 | 0.83 | 24 |
| Heifer | 0 | 3.00 | 0.14 | 0 | 1.50 | 0.11 | 0 | 2.00 | 0.04 | 0 | 5.00 | 0.04 | 0 | 10.00 | 0.56 | 0 | 5.50 | 0.37 | 0 | 10.00 | 0.18 | 5 |
| Calves | 0 | 0.80 | 0.09 | 0 | 1.80 | 0.09 | 0 | 2.20 | 0.08 | 0 | 1.80 | 0.06 | 0 | 6.00 | 0.30 | 0 | 8.20 | 0.22 | 0 | 8.20 | 0.12 | 4 |
| Sheep | 0 | 4.30 | 0.20 | 0 | 2.90 | 0.09 | 0 | 3.40 | 0.13 | 0 | 2.30 | 0.09 | 0 | 8.00 | 0.18 | 0 | 5.10 | 0.09 | 0 | 8.00 | 0.13 | 4 |
| Goats | 0 | 3.00 | 0.10 | 0 | 3.00 | 0.12 | 0 | 3.20 | 0.07 | 0 | 12.2 | 0.21 | 0 | 10.00 | 0.41 | 0 | 5.40 | 0.41 | 0 | 12.20 | 0.21 | 6 |
| Donkeys | 0 | 5.00 | 0.28 | 0 | 2.00 | 0.35 | 0 | 30.00 | 0.67 | 0 | 15.00 | 0.73 | 0 | 2.00 | 0.25 | 0 | 7.00 | 0.35 | 0 | 30.00 | 0.49 | 14 |
| Horses | 0 | 4.80 | 0.01 | 0 | 0.80 | 0.009 | 0 | 4.80 | 0.008 | 0 | 1.60 | 0.001 | 0 | 0.80 | 0.004 | 0 | 3.20 | 0.004 | 0 | 4.80 | 0.01 | 0 |
| Mules | 0 | 1.40 | 0.02 | 0 | 0.70 | 0.002 | 0 | 1.40 | 0.002 | 0 | 3.50 | 0.003 | 0 | 0.70 | 0.001 | 0 | 7.00 | 0.70 | 0 | 3.50 | 0.00 | 0 |
| Camels | 0 | 3.30 | 0.02 | 0 | 5.50 | 0.02 | 0 | 2.20 | 0.002 | 0 | 17.6 | 0.08 | 0 | 2.20 | 0.04 | 0 | 2.20 | 0.11 | 0 | 17.6 | 0.06 | 2 |
| Chickens | 0 | 1.00 | 0.02 | 0 | 0.40 | 0.03 | 0 | 0.50 | 0.01 | 0 | 0.25 | 0.01 | 0 | 0.70 | 0.03 | 0 | 15.00 | 0.05 | 0 | 15.00 | 0.03 | 1 |
| Pigs | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 |
| Bee hive | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | 0 | 6.60 | 3.34 | 0 | 5.50 | 2.77 | 0 | 5.00 | 2.16 | 0 | 10.00 | 2.62 | 0 | 40.00 | 5.64 | 0 | 44.00 | 5.61 | 0 | 44.00 | 3.41 | 100 |

N = Total number of respondents; HOUSEHOLDs = Households; Av= Average; Mn = Minimum; Mx= Maximum; TLU = An animal with 250 kg body weight

Appendix Table 3.3.72. Livestock herd size per household in Tropical Livestock Unit (TLU) in urban areas of Tigray by zone (N= 478 HOUSEHOLDs)

| Animal type | Southern | | | Mekelle | | | Eastern | | | Central | | | Western | | | North west | | | Overall | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Av | TLU share (%) |
| Cattle | 0.00 | 15.4 | 1.45 | 0.00 | 24.7 | 2.67 | 0.00 | 18.00 | 1.01 | 0.00 | 11.6 | 1.48 | 0.00 | 13.4 | 0.7 | 0.00 | 28.20 | 3.20 | 2.32 | 82 |
| Bull | 0.00 | 1.20 | 0.07 | 0.00 | 2.40 | 0.17 | 0.00 | 1.20 | 0.06 | 0.00 | 1.20 | 0.07 | 0.00 | 3.60 | 0.05 | 0.00 | 4.20 | 0.25 | 0.10 | 4 |
| Oxen | 0.00 | 2.20 | 0.56 | 0.00 | 5.50 | 0.59 | 0.00 | 4.40 | 0.13 | 0.00 | 3.30 | 0.34 | 0.00 | 2.20 | 0.18 | 0.00 | 11.00 | 0.94 | 0.45 | 16 |
| Cows | 0.00 | 9.00 | 0.65 | 0.00 | 15.00 | 1.63 | 0.00 | 11.00 | 0.76 | 0.00 | 5.00 | 0.87 | 0.00 | 6.00 | 0.42 | 0.00 | 10.00 | 1.77 | 1.60 | 56 |
| Heifer | 0.00 | 1.00 | 0.08 | 0.00 | 1.00 | 0.20 | 0.00 | 1.00 | 0.02 | 0.00 | 1.50 | 0.13 | 0.00 | 1.00 | 0.02 | 0.00 | 1.00 | 0.06 | 0.09 | 3 |
| Calves | 0.00 | 2.00 | 0.09 | 0.00 | 0.80 | 0.08 | 0.00 | 0.40 | 0.04 | 0.00 | 0.60 | 0.07 | 0.00 | 0.60 | 0.03 | 0.00 | 2.00 | 0.18 | 0.08 | 3 |
| Sheep | 0.00 | 2.00 | 0.24 | 0.00 | 2.50 | 0.13 | 0.00 | 1.20 | 0.25 | 0.00 | 1.50 | 0.24 | 0.00 | 10.00 | 0.68 | 0.00 | 0.80 | 0.05 | 0.27 | 10 |
| Goats | 0.00 | 0.70 | 0.02 | 0.00 | 2.00 | 0.03 | 0.00 | 0.80 | 0.01 | 0.00 | 2.00 | 0.08 | 0.00 | 1.00 | 0.07 | 0.00 | 2.00 | 0.10 | 0.05 | 2 |
| Donkeys | 0.00 | 2.00 | 0.07 | 0.00 | 2.50 | 0.16 | 0.00 | 1.00 | 0.01 | 0.00 | 1.50 | 0.11 | 0.00 | 1.00 | 0.11 | 0.00 | 0.50 | 0.16 | 0.10 | 3 |
| Horses | 0.00 | 0.80 | 0.02 | 0.00 | 0.80 | 0.05 | 0.00 | 0.80 | 0.02 | 0.00 | 0.80 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 1 |
| Mules | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.70 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0 |
| Camels | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.10 | 0.07 | 0.01 | 0 |
| Chickens | 0.00 | 15.00 | 0.15 | 0.00 | 3.00 | 0.07 | 0.00 | 1.00 | 0.09 | 0.00 | 0.50 | 0.05 | 0.00 | 0.15 | 0.05 | 0.00 | 0.60 | 0.02 | 0.08 | 3 |
| Pigs | 0.00 | 0.90 | 0.01 | 0.00 | 3.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0 |
| Bee hive | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | 0.00 | 15.00 | 1.96 | 0.00 | 10.50 | 3.15 | 0.00 | 7.70 | 1.38 | 0.00 | 1.09 | 1.97 | 0.00 | 10.00 | 1.61 | 0.00 | 7.00 | 3.58 | 2.88 | 100 |

N = Total number of respondents; HOUSEHOLDs = Households; Av= Average; Mn = Minimum; Mx= Maximum; TLU = An animal with 250 kg body weight

Appendix Table 3.3.73. Cattle herd composition by age and sex in Tigray region by zone (N= 6060 HOUSEHOLDs)

| Cattle class | Southern | | South east | | Eastern | | Central | | Western | | North west | | Overall | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number | Share (%) | Number | Share (%) | Number | Share (%) | Number | Share (%) | Number | Share (%) | Number | Share (%) | Number | Share (%) |
| Urban | | | | | | | | | | | | | | |
| Bulls | 0.12 | 6 | 0.29 | 9 | 0.10 | 8 | 0.11 | 6 | 0.09 | 10 | 0.42 | 10 | 0.190 | 6.81 |
| Oxen | 0.51 | 27 | 0.54 | 17 | 0.12 | 10 | 0.31 | 17 | 0.16 | 18 | 0.85 | 21 | 0.420 | 15.05 |
| Cows | 0.65 | 35 | 1.63 | 50 | 0.76 | 62 | 0.87 | 47 | 0.42 | 48 | 1.77 | 44 | 1.600 | 57.35 |
| Heifers | 0.16 | 9 | 0.39 | 12 | 0.04 | 3 | 0.24 | 13 | 0.04 | 5 | 0.11 | 3 | 0.170 | 6.09 |
| Calves | 0.43 | 23 | 0.42 | 13 | 0.21 | 17 | 0.32 | 17 | 0.17 | 19 | 0.88 | 22 | 0.410 | 14.70 |
| Total | 1.87 | 100 | 3.27 | 100 | 1.23 | 100 | 1.85 | 100 | 0.88 | 100 | 4.03 | 100 | 2.790 | 100.00 |
| Infant town | | | | | | | | | | | | | | |
| Bulls | 0.17 | 5.88 | 0.13 | 5.70 | 0.10 | 6.45 | 0.14 | 11.76 | 0.49 | 8.10 | 0.61 | 10.22 | 0.348 | 8.76 |
| Oxen | 0.91 | 31.49 | 0.80 | 35.09 | 0.66 | 42.58 | 0.59 | 49.58 | 0.74 | 12.23 | 1.54 | 25.80 | 0.955 | 24.03 |
| Cows | 1.07 | 37.02 | 0.71 | 31.14 | 0.25 | 16.13 | 0.15 | 12.61 | 2.30 | 38.02 | 1.67 | 27.97 | 1.227 | 30.88 |
| Heifers | 0.21 | 7.27 | 0.13 | 5.70 | 0.08 | 5.16 | 0.14 | 11.76 | 1.06 | 17.52 | 0.92 | 15.41 | 0.563 | 14.17 |
| Calves | 0.53 | 18.34 | 0.51 | 22.37 | 0.46 | 29.68 | 0.17 | 14.29 | 1.46 | 24.13 | 1.23 | 20.60 | 0.881 | 22.17 |
| Total | 2.89 | 100 | 2.28 | 100 | 1.55 | 100 | 1.19 | 100 | 6.05 | 100 | 5.97 | 100 | 3.974 | 100 |
| Rural | | | | | | | | | | | | | | |
| Bulls | 0.23 | 7.17 | 0.19 | 7.06 | 0.12 | 7.45 | 0.18 | 9.89 | 0.74 | 10.65 | 0.54 | 10.53 | 0.291 | 9.38 |
| Oxen | 1.27 | 39.56 | 1.13 | 42.01 | 0.77 | 47.83 | 0.98 | 53.85 | 1.27 | 18.27 | 1.33 | 25.93 | 1.095 | 35.31 |
| Cows | 0.97 | 30.22 | 0.61 | 22.68 | 0.25 | 15.53 | 0.25 | 13.74 | 2.25 | 32.37 | 1.44 | 28.07 | 0.773 | 24.93 |
| Heifers | 0.3 | 9.35 | 0.28 | 10.41 | 0.09 | 5.59 | 0.08 | 4.40 | 1.14 | 16.40 | 0.71 | 13.84 | 0.333 | 10.74 |
| Calves | 0.44 | 13.71 | 0.48 | 17.84 | 0.38 | 23.60 | 0.33 | 18.13 | 1.55 | 22.30 | 1.11 | 21.64 | 0.609 | 19.64 |
| Total | 3.21 | 100 | 2.69 | 100 | 1.61 | 100 | 1.82 | 100 | 6.95 | 100 | 5.13 | 100 | 3.101 | 100 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.74. Sheep flock composition by age and sex in Tigray by zone (N= 5582 HOUSEHOLDs)

| Sheep class | Southern | | South east | | Eastern | | Central | | Western | | North west | | Overall | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number | Share (%) | Number | Share (%) | Number | Share (%) | Number | Share (%) | Number | Share (%) | Number | Share (%) | Number | Share (%) |
| Infant town | | | | | | | | | | | | | | |
| Sheep rams | 0.168 | 14.80 | 0.155 | 26.86 | 0.200 | 14.58 | 0.391 | 29.51 | 0.443 | 11.37 | 0.568 | 36.79 | 0.232 | 13.08 |
| Sheep ewes | 0.894 | 78.77 | 0.422 | 73.14 | 0.806 | 58.75 | 0.815 | 61.51 | 2.573 | 66.04 | 0.706 | 45.73 | 1.172 | 66.07 |
| Sheep lambs | 0.073 | 6.43 | 0 | 0.00 | 0.366 | 26.68 | 0.119 | 8.98 | 0.88 | 22.59 | 0.27 | 17.49 | 0.370 | 20.86 |
| Total | 1.135 | 100 | 0.577 | 100 | 1.372 | 100 | 1.325 | 100 | 3.896 | 100 | 1.544 | 100 | 1.774 | 100 |
| Rural | | | | | | | | | | | | | | |
| Sheep rams | 0.263 | 12.13 | 0.141 | 13.68 | 0.176 | 12.85 | 0.166 | 17.60 | 0.075 | 9.86 | 1.575 | 66.04 | 0.173 | 14.13 |
| Sheep ewes | 1.49 | 68.70 | 0.758 | 73.52 | 0.656 | 47.88 | 0.448 | 47.51 | 0.559 | 73.46 | 0.609 | 25.53 | 0.726 | 59.31 |
| Sheep lambs | 0.416 | 19.18 | 0.132 | 12.80 | 0.538 | 39.27 | 0.329 | 34.89 | 0.127 | 16.69 | 0.201 | 8.43 | 0.325 | 26.55 |
| Total | 2.169 | 100 | 1.031 | 100 | 1.37 | 100 | 0.943 | 100 | 0.761 | 100 | 2.385 | 100 | 1.224 | 100 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.75. Goat flock composition by age and sex in Tigray by zone (N= 5582 HOUSEHOLDs)

| Goat class | Southern | | South east | | Eastern | | Central | | Western | | North west | | Overall | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number | Share (%) | Number | Share (%) | Number | Share (%) | Number | Share (%) | Number | Share (%) | Number | Share (%) | Number | Share (%) |
| Infant town | | | | | | | | | | | | | | |
| Goat bucks | 0.031 | 2.76 | 0.022 | 2.54 | 0.026 | 5.58 | 0.434 | 43.97 | 0.187 | 4.85 | 0.36 | 7.32 | 0.204 | 7.75 |
| Goat does | 0.831 | 73.87 | 0.777 | 89.83 | 0.22 | 47.21 | 0.271 | 27.46 | 2.585 | 67.02 | 3.578 | 72.74 | 1.797 | 68.30 |
| Goat kids | 0.263 | 23.38 | 0.066 | 7.63 | 0.22 | 47.21 | 0.282 | 28.57 | 1.085 | 28.13 | 0.981 | 19.94 | 0.63 | 23.95 |
| Total | 1.125 | 100.00 | 0.865 | 100.00 | 0.466 | 100.00 | 0.987 | 100.00 | 3.857 | 100.00 | 4.919 | 100.00 | 2.631 | 100.00 |
| Rural | | | | | | | | | | | | | | |
| Goat bucks | 0.069 | 7.00 | 0.115 | 8.95 | 0.081 | 10.29 | 0.402 | 18.44 | 0.325 | 7.50 | 0.197 | 5.92 | 0.215 | 10.70 |
| Goat does | 0.635 | 64.40 | 0.923 | 71.83 | 0.282 | 35.83 | 0.785 | 36.01 | 2.872 | 66.28 | 2.254 | 67.75 | 1.107 | 55.10 |
| Goat kids | 0.282 | 28.60 | 0.247 | 19.22 | 0.424 | 53.88 | 0.993 | 45.55 | 1.136 | 26.22 | 0.876 | 26.33 | 0.687 | 34.20 |
| Total | 0.986 | 100.00 | 1.285 | 100.00 | 0.787 | 100.00 | 2.18 | 100.00 | 4.333 | 100.00 | 3.327 | 100.00 | 2.009 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.76. Chicken flock composition by age and sex in Tigray by zone (N= 5582 HOUSEHOLDs)

| Chicken class | Southern | | South east | | Eastern | | Central | | Western | | North west | | Overall | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number | Share (%) | Number | Share (%) | Number | Share (%) | Number | Share (%) | Number | Share (%) | Number | Share (%) | Number | Share (%) |
| Infant town | | | | | | | | | | | | | | |
| Chicken cock | 0.568 | 22.31 | 0.733 | 23.07 | 0.380 | 22.91 | 0.141 | 12.61 | 0.221 | 6.39 | 0.279 | 7.06 | 0.331 | 11.68 |
| Chicken hen | 1.747 | 68.62 | 2.311 | 72.74 | 1.053 | 63.47 | 0.76 | 67.98 | 1.903 | 55.02 | 2.241 | 56.72 | 1.698 | 59.94 |
| Chicken chick | 0.231 | 9.07 | 0.133 | 4.19 | 0.226 | 13.62 | 0.217 | 19.41 | 1.335 | 38.59 | 1.431 | 36.22 | 0.804 | 28.38 |
| Total | 2.546 | 100.00 | 3.177 | 100.00 | 1.659 | 100.00 | 1.118 | 100.00 | 3.459 | 100.00 | 3.951 | 100.00 | 2.833 | 100.00 |
| Rural | | | | | | | | | | | | | | |
| Chicken cock | 0.202 | 11.23 | 0.278 | 10.09 | 0.238 | 19.22 | 0.235 | 16.27 | 0.206 | 7.47 | 0.356 | 6.46 | 0.256 | 10.37 |
| Chicken hen | 1.11 | 61.70 | 1.752 | 63.57 | 0.801 | 64.70 | 0.942 | 65.24 | 1.525 | 55.29 | 2.136 | 38.77 | 1.292 | 52.35 |
| Chicken chick | 0.487 | 27.07 | 0.726 | 26.34 | 0.199 | 16.07 | 0.267 | 18.49 | 1.027 | 37.24 | 3.018 | 54.77 | 0.920 | 37.28 |
| Total | 1.799 | 100.00 | 2.756 | 100.00 | 1.238 | 100.00 | 1.444 | 100.00 | 2.758 | 100.00 | 5.51 | 100.00 | 2.468 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.77. Cattle breed composition per household in Tigray (N= 5582 HOUSEHOLDs)

| Cattle breed | Southern | | South east | | Eastern | | Central | | Western | | North west | | Overall | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number | Share (%) | Number | Share (%) | Number | Share (%) | Number | Share (%) | Number | Share (%) | Number | Share (%) | Number | Share (%) |
| Infant town | | | | | | | | | | | | | | |
| Local | 2.6 | 89.19 | 1.933 | 84.48 | 1.333 | 84.80 | 1.152 | 95.52 | 4.63 | 86.90 | 5.473 | 91.40 | 3.3940 | 89.11 |
| Cross | 0.252 | 8.64 | 0.022 | 0.96 | 0.093 | 5.92 | 0 | 0.00 | 0.352 | 6.61 | 0.383 | 6.40 | 0.2366 | 6.21 |
| Exotic | 0.063 | 2.16 | 0.333 | 14.55 | 0.146 | 9.29 | 0.054 | 4.48 | 0.346 | 6.49 | 0.132 | 2.20 | 0.1781 | 4.68 |
| Total | 2.915 | 100 | 2.288 | 100 | 1.572 | 100 | 1.206 | 100 | 5.328 | 100 | 5.988 | 100 | 3.8087 | 100 |
| Rural | | | | | | | | | | | | | | |
| Local | 3.012 | 93.19 | 2.534 | 95.37 | 1.534 | 93.31 | 1.793 | 97.02 | 6.577 | 94.35 | 4.834 | 94.91 | 2.9320 | 94.76 |
| Cross | 0.151 | 4.67 | 0.082 | 3.09 | 0.076 | 4.62 | 0.041 | 2.22 | 0.288 | 4.13 | 0.15 | 2.95 | 0.1078 | 3.48 |
| Exotic | 0.069 | 2.13 | 0.041 | 1.54 | 0.034 | 2.07 | 0.014 | 0.76 | 0.106 | 1.52 | 0.109 | 2.14 | 0.0544 | 1.76 |
| Total | 3.232 | 100 | 2.657 | 100 | 1.644 | 100 | 1.848 | 100 | 6.971 | 100 | 5.093 | 100 | 3.0942 | 100 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.78. Oxen ownership per household in Tigray by zone (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)

| Ox number | Oxen ownership by administrative zone | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Southern | | South east | | Eastern | | Central | | Western | | North west | | Overall | |
| | n | % | n | % | n | % | n | % | n | % | n | % | n | % |
| Infant town | | | | | | | | | | | | | | |
| No ox | 44 | 46.32 | 24 | 53.33 | 86 | 57.33 | 52 | 56.52 | 112 | 63.64 | 57 | 27.01 | 375 | 48.76 |
| One ox | 22 | 23.16 | 7 | 15.56 | 33 | 22.00 | 25 | 27.17 | 21 | 11.93 | 48 | 22.75 | 156 | 20.29 |
| Pair oxen | 25 | 26.32 | 13 | 28.89 | 27 | 18.00 | 15 | 16.30 | 32 | 18.18 | 88 | 41.71 | 200 | 26.01 |
| Three and above oxen | 4 | 4.21 | 1 | 2.22 | 4 | 2.67 | 0 | 0.00 | 11 | 6.25 | 18 | 8.53 | 38 | 4.94 |
| Total | 95 | 100.00 | 45 | 100.00 | 150 | 100.00 | 92 | 100.00 | 176 | 100.00 | 211 | 100.00 | 769 | 100.00 |
| Rural | | | | | | | | | | | | | | |
| No ox | 220 | 27.95 | 135 | 29.35 | 395 | 44.04 | 496 | 35.25 | 112 | 34.04 | 233 | 24.97 | 1591 | 33.06 |
| One ox | 208 | 26.43 | 153 | 33.26 | 324 | 36.12 | 456 | 32.41 | 78 | 23.71 | 267 | 28.62 | 1486 | 30.87 |
| Pair oxen | 312 | 39.64 | 156 | 33.91 | 166 | 18.51 | 436 | 30.99 | 101 | 30.70 | 373 | 39.98 | 1542 | 32.04 |
| Three and above oxen | 47 | 5.97 | 16 | 3.48 | 12 | 1.34 | 21 | 1.49 | 38 | 11.55 | 60 | 6.43 | 194 | 4.03 |
| Total | 787 | 100.00 | 460 | 100.00 | 897 | 100.00 | 1407 | 100.00 | 329 | 100.00 | 933 | 100.00 | 4813 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households; n = number of respondents

Appendix Table 3.3.79. Household livestock asset ownership (Eth birr) in the last 12 months (March 2017 – April 2018) in urban areas of Tigray by administrative zone (N = 478 HOUSEHOLDs)

| Animal type | Household livestock asset ownership by administrative zone | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Southern | | Mekelle | | Eastern | | Central | | Western | | North west | | Overall | |
| | Holding | Value | Holding | Value | Holding | Value | Holding | Value | Holding | Value | Holding | Value | Holding | Value |
| Bulls | 0.12 | 580 | 0.29 | 1290 | 0.10 | 937 | 0.11 | 514 | 0.09 | 93 | 0.42 | 1363 | 0.17 | 773 |
| Oxen | 0.51 | 4566 | 0.54 | 1919 | 0.12 | 1027 | 0.31 | 1136 | 0.16 | 1156 | 0.85 | 2178 | 0.41 | 2182 |
| Cows | 0.65 | 6843 | 1.63 | 19681 | 0.76 | 9739 | 0.87 | 7462 | 0.42 | 2187 | 1.77 | 7883 | 1.60 | 8894 |
| Heifers | 0.16 | 616 | 0.39 | 4959 | 0.04 | 513 | 0.26 | 1201 | 0.04 | 390 | 0.11 | 359 | 0.17 | 1321 |
| Calves | 0.43 | 1119 | 0.42 | 1698 | 0.21 | 444 | 0.33 | 754 | 0.17 | 343 | 0.88 | 1036 | 0.41 | 922 |
| Sheep | 3.03 | 2913 | 1.31 | 1121 | 2.45 | 1477 | 2.44 | 1119 | 6.81 | 1422 | 0.54 | 264 | 2.74 | 1519 |
| Goats | 0.30 | 39 | 0.32 | 55 | 0.11 | 55 | 0.75 | 364 | 0.70 | 274 | 0.97 | 171 | 0.50 | 156 |
| Donkeys | 0.14 | 234 | 0.31 | 433 | 0.02 | 20 | 0.22 | 326 | 0.21 | 534 | 0.31 | 900 | 0.20 | 382 |
| Horses | 0.08 | 392 | 0.06 | 864 | 0.02 | 138 | 0.02 | 193 | 0.00 | 0 | 0.00 | 0 | 0.03 | 284 |
| Mules | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.01 | 576 | 0.00 | 0 | 0.00 | 0 | 0.02 | 172 |
| Camels | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.06 | 892 | 0.01 | 121 |
| Chickens | 15.54 | 1214 | 6.83 | 372 | 8.69 | 2740 | 4.96 | 369 | 5.47 | 90 | 2.07 | 46 | 7.97 | 840 |
| Pig | 0.02 | 0 | 0.13 | 27 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.03 | 4 |
| Bee hive | 0.15 | 16 | 0.06 | 13 | 0.00 | 0 | 0.05 | 58 | 0.00 | 0 | 0.00 | 0 | 0.05 | 17 |
| Total | - | 18532 | - | 32432 | - | 17090 | - | 14072 | - | 6489 | - | 15092 | - | 17587 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.80. Household livestock asset ownership (Eth birr) in the last 12 months (March 2017 – April 2018) in infant towns and rural areas of Tigray by administrative zone (N = 5582 HOUSEHOLDs)

| Animal type | Household livestock asset ownership by administrative zone | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Southern | | South east | | Eastern | | Central | | Western | | North west | | Overall | |
| | Holding | Value | Holding | Value | Holding | Value | Holding | Value | Holding | Value | Holding | Value | Holding | Value |
| Bulls | 0.22 | 2061 | 0.19 | 1780 | 0.12 | 1124 | 0.18 | 1687 | 0.65 | 6091 | 0.56 | 5247 | 0.29 | 2717 |
| Oxen | 1.23 | 10527 | 0.97 | 8302 | 0.75 | 6419 | 0.96 | 8216 | 1.08 | 9243 | 1.37 | 11725 | 1.07 | 9157 |
| Cows | 0.98 | 12558 | 0.62 | 7945 | 0.25 | 3204 | 0.24 | 3075 | 2.26 | 28961 | 1.48 | 18965 | 0.83 | 10636 |
| Heifers | 0.29 | 2253 | 0.21 | 1632 | 0.09 | 699 | 0.09 | 699 | 1.11 | 8625 | 0.75 | 5828 | 0.36 | 2797 |
| Calves | 0.45 | 1012 | 0.49 | 1102 | 0.39 | 877 | 0.32 | 719 | 1.52 | 3417 | 1.13 | 2540 | 0.64 | 1439 |
| Sheep | 2.05 | 1236 | 0.97 | 585 | 1.37 | 826 | 0.97 | 585 | 1.85 | 1115 | 0.98 | 591 | 1.3 | 784 |
| Goats | 1 | 500 | 1.25 | 625 | 0.73 | 365 | 2.11 | 1055 | 4.16 | 2080 | 3.62 | 1810 | 2.09 | 1045 |
| Donkeys | 0.55 | 1051 | 0.7 | 1337 | 1.33 | 2540 | 1.46 | 2789 | 0.51 | 974 | 0.7 | 1337 | 0.98 | 1872 |
| Horses | 0.013 | 148 | 0.011 | 125 | 0.01 | 114 | 0.002 | 23 | 0.005 | 57 | 0.005 | 57 | 0.007 | 80 |
| Mules | 0.03 | 258 | 0.003 | 26 | 0.003 | 26 | 0.005 | 43 | 0.001 | 9 | 0.001 | 9 | 0.007 | 60 |
| Camels | 0.24 | 2904 | 0.02 | 242 | 0.001 | 12 | 0.07 | 847 | 0.03 | 363 | 0.09 | 1089 | 0.05 | 605 |
| Chickens | 1.88 | 593 | 2.77 | 873 | 1.29 | 407 | 1.42 | 448 | 3 | 946 | 5.22 | 1646 | 2.52 | 795 |
| Pig | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bee hive | 0.032 | 26 | 0.45 | 360 | 0.002 | 2 | 0.012 | 10 | 0.19 | 152 | 0.129 | 103 | 0.09 | 72 |
| Total | - | 3512 | - | 24933 | - | 16614 | - | 20195 | - | 62031 | - | 50946 | - | 32058 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.81. Livestock acquisition and disposition among livestock owning households in the last 12 months (March 2017 – April 2018) in Tigray (N = 6060 HOUSEHOLDs) (% of HOUSEHOLDs)

| Animal | Buying any animal | | | | Selling any animal | | | | Losing any animal | | | | Slaughtering any animal | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| type | Rg | Ur | IT | Ru | Rg | Ur | IT | Ru | Rg | Ur | IT | Ru | Rg | Ur | IT | Ru |
| Bulls | 2.00 | 8.89 | 9.74 | 10.63 | 3.97 | 22.22 | 30.52 | 21.78 | 4.61 | 8.89 | 12.99 | 35.19 | 0.19 | 0.00 | 3.25 | 0.93 |
| Oxen | 2.29 | 28.57 | 0.76 | 1.40 | 7.23 | 34.07 | 7.36 | 2.64 | 4.47 | 10.99 | 3.05 | 4.62 | 1.20 | 2.20 | 0.25 | 0.12 |
| Cows | 2.76 | 14.95 | 2.36 | 1.67 | 6.56 | 17.01 | 7.35 | 5.42 | 6.95 | 17.01 | 8.66 | 5.66 | 0.65 | 1.55 | 0.26 | 0.64 |
| Heifers | 1.65 | 3.57 | 2.58 | 1.35 | 3.21 | 17.86 | 3.61 | 2.28 | 1.89 | 1.79 | 3.09 | 1.66 | 0.16 | 0.00 | 0.00 | 0.21 |
| Calves | 0.41 | 3.48 | 0.63 | 0.17 | 0.81 | 7.83 | 0.63 | 0.39 | 2.67 | 5.22 | 3.45 | 2.36 | 0.41 | 0.00 | 0.63 | 0.39 |
| Sheep | 5.70 | 27.22 | 6.99 | 2.71 | 13.00 | 41.14 | 11.29 | 9.61 | 10.37 | 36.71 | 12.90 | 6.57 | 13.38 | 46.84 | 17.20 | 8.46 |
| Goats | 3.56 | 37.14 | 5.76 | 2.45 | 15.64 | 34.29 | 24.08 | 14.06 | 14.25 | 40.00 | 27.75 | 11.82 | 14.55 | 40.00 | 31.41 | 11.68 |
| Donkeys | 2.11 | 17.19 | 2.23 | 1.65 | 1.13 | 12.50 | 1.91 | 0.69 | 1.17 | 17.19 | 1.27 | 0.69 | - | - | - | - |
| Horses | 17.14 | 25.00 | 10.00 | 15.38 | 0.00 | 0.00 | 0.00 | 0.00 | 5.71 | 8.33 | 10.00 | 0.00 | - | - | - | - |
| Mules | 10.26 | - | 0.00 | 9.09 | 5.13 | - | 0.00 | 3.03 | 0.00 | 0.00 | 0.00 | 0.00 | - | - | - | - |
| Camels | 4.95 | 25.00 | 2.94 | 4.86 | 1.65 | 25.00 | 0.00 | 1.39 | 1.10 | 0.00 | 0.00 | 1.39 | - | - | - | - |
| Chickens | 8.81 | 41.62 | 8.62 | 6.31 | 8.23 | 20.81 | 8.91 | 7.16 | 13.86 | 34.68 | 17.53 | 11.67 | 16.43 | 49.71 | 20.98 | 13.15 |
| Pigs | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Beehives | 0.37 | 16.67 | 3.29 | 4.10 | 1.12 | 0.00 | 0.00 | 1.44 | 0.37 | 16.67 | 0.00 | 0.00 | - | - | - | - |
| Overall | 12.57 | 43.93 | 13.13 | 9.89 | 22.61 | 45.40 | 28.22 | 19.41 | 26.67 | 41.84 | 29.26 | 24.72 | 15.73 | 37.66 | 22.63 | 12.45 |

N = Total number of respondents; HOUSEHOLDs = Households; Rg = Regional; Ur = Urban; IT = Infant town; Ru = Rural

Appendix Table 3.3.82. Livestock acquisition and disposition among livestock owning households in the last 12 months (March 2017 – April 2018) in southern zone of Tigray (N = 882 HOUSEHOLDs) (% of HOUSEHOLDs)

| Animal type | Buying any animal | | Selling any animal | | Losing any animal | | Slaughtering any animal | |
|---|---|---|---|---|---|---|---|---|
| | Infant town | Rural | Infant town | Rural | Infant town | Rural | Infant town | Rural |
| Bulls | 4.21 | 4.45 | 5.26 | 8.13 | 2.11 | 1.40 | 0.00 | 0.00 |
| Oxen | 0.00 | 1.14 | 1.05 | 1.27 | 0.00 | 0.38 | 0.00 | 0.00 |
| Cows | 2.11 | 1.91 | 3.16 | 2.67 | 2.11 | 1.91 | 1.05 | 0.13 |
| Heifers | 0.00 | 0.38 | 1.05 | 0.13 | 0.00 | 0.38 | 0.00 | 0.00 |
| Calves | 1.05 | 0.25 | 1.05 | 0.00 | 1.05 | 0.38 | 0.00 | 0.00 |
| Sheep | 5.26 | 2.41 | 1.05 | 8.77 | 4.21 | 5.21 | 3.16 | 7.75 |
| Goats | 3.16 | 0.25 | 3.16 | 5.08 | 4.21 | 2.16 | 2.11 | 3.43 |
| Donkeys | 2.11 | 0.64 | 0.00 | 1.02 | 0.00 | 0.38 | - | - |
| Horses | 1.05 | 0.00 | 0.00 | 0.00 | 1.05 | 0.00 | - | - |
| Mules | 0.00 | 0.13 | 0.00 | 0.13 | 0.00 | 0.00 | - | - |
| Camels | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | - | - |
| Chickens | 5.26 | 5.08 | 6.32 | 5.46 | 5.26 | 5.72 | 9.47 | 6.61 |
| Pigs | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Beehives | 0.00 | 0.00 | 0.00 | 0.13 | 0.00 | 0.13 | - | - |
| Overall | 24.21 | 16.77 | 22.11 | 32.78 | 20.00 | 18.04 | 15.79 | 17.92 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.83. Livestock acquisition and disposition among livestock owning households in the last 12 months (March 2017 – April 2018) in south east zone of Tigray (N = 505 HOUSEHOLDs) (% of HOUSEHOLDs)

| Animal type | Buying any animal | | Selling any animal | | Losing any animal | | Slaughtering any animal | |
|---|---|---|---|---|---|---|---|---|
| | Infant town | Rural | Infant town | Rural | Infant town | Rural | Infant town | Rural |
| Bulls | 4.44 | 4.78 | 4.44 | 6.52 | 0.00 | 0.65 | 0.00 | 0.22 |
| Oxen | 0.00 | 0.43 | 0.00 | 1.52 | 0.00 | 0.22 | 0.00 | 0.00 |
| Cows | 4.44 | 0.43 | 6.67 | 3.26 | 6.67 | 0.87 | 0.00 | 0.00 |
| Heifers | 0.00 | 0.22 | 0.00 | 0.43 | 0.00 | 0.00 | 0.00 | 0.00 |
| Calves | 0.00 | 0.00 | 0.00 | 1.09 | 0.00 | 0.43 | 0.00 | 0.00 |
| Sheep | 4.44 | 1.30 | 2.22 | 4.13 | 2.22 | 2.39 | 0.00 | 3.04 |
| Goats | 0.00 | 0.22 | 4.44 | 6.09 | 2.22 | 3.70 | 2.22 | 2.61 |
| Donkeys | 2.22 | 2.17 | 2.22 | 0.43 | 0.00 | 0.43 | - | - |
| Horses | 0.00 | 0.22 | 0.00 | 0.00 | 0.00 | 0.00 | - | - |
| Mules | 0.00 | 0.43 | 0.00 | 0.00 | 0.00 | 0.00 | - | - |
| Camels | 0.00 | 0.22 | 0.00 | 0.00 | 0.00 | 0.00 | - | - |
| Chickens | 6.67 | 4.78 | 4.44 | 8.91 | 11.11 | 8.48 | 11.11 | 12.39 |
| Pigs | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Beehives | 0.00 | 0.00 | 0.00 | 0.22 | 0.00 | 0.00 | - | - |
| Overall | 22.22 | 15.22 | 24.44 | 32.61 | 22.22 | 17.17 | 13.33 | 18.26 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.84. Livestock acquisition and disposition among livestock owning households in the last 12 months (March 2017 – April 2018) in western zone of Tigray (N = 505 HOUSEHOLDs) (% of HOUSEHOLDs)

| Animal type | Buying any animal | | Selling any animal | | Losing any animal | | Slaughtering any animal | |
|---|---|---|---|---|---|---|---|---|
| | Infant town | Rural | Infant town | Rural | Infant town | Rural | Infant town | Rural |
| Bulls | 1.70 | 3.34 | 6.25 | 7.60 | 2.27 | 3.95 | 1.14 | 0.00 |
| Oxen | 0.57 | 0.61 | 6.25 | 6.38 | 0.00 | 1.82 | 0.57 | 0.30 |
| Cows | 1.14 | 2.13 | 6.25 | 6.99 | 10.80 | 7.60 | 0.00 | 1.22 |
| Heifers | 1.14 | 0.91 | 1.70 | 2.43 | 1.70 | 0.91 | 0.00 | 0.30 |
| Calves | 0.57 | 0.30 | 0.57 | 0.30 | 3.41 | 3.65 | 1.14 | 0.30 |
| Sheep | 1.70 | 0.61 | 5.68 | 1.82 | 6.82 | 1.52 | 11.36 | 2.43 |
| Goats | 2.27 | 3.65 | 8.52 | 9.12 | 10.23 | 10.33 | 14.20 | 11.55 |
| Donkeys | 1.14 | 2.43 | 1.14 | 0.00 | 1.14 | 1.52 | - | - |
| Horses | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.91 | - | - |
| Mules | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | - | - |
| Camels | 0.00 | 0.30 | 0.00 | 0.00 | 0.00 | 0.00 | - | - |
| Chickens | 5.68 | 6.99 | 4.55 | 3.34 | 14.77 | 10.64 | 15.34 | 13.37 |
| Pigs | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Beehives | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.30 | - | - |
| Overall | 15.91 | 21.28 | 40.91 | 37.99 | 51.14 | 43.16 | 43.75 | 29.48 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.85. Livestock acquisition and disposition among livestock owning households in the last 12 months (March 2017 – April 2018) in north west zone of Tigray (N = 1147 HOUSEHOLDs) (% of HOUSEHOLDs)

| Animal type | Buying any animal | | Selling any animal | | Losing any animal | | Slaughtering any animal | |
|---|---|---|---|---|---|---|---|---|
| | Infant town | Rural | Infant town | Rural | Infant town | Rural | Infant town | Rural |
| Bulls | 2.84 | 3.54 | 13.74 | 7.93 | 1.90 | 2.89 | 1.42 | 0.86 |
| Oxen | 0.47 | 1.82 | 8.06 | 3.86 | 1.42 | 1.82 | 0.00 | 0.21 |
| Cows | 1.42 | 0.96 | 5.21 | 5.47 | 4.27 | 5.36 | 0.00 | 0.75 |
| Heifers | 1.42 | 0.54 | 1.42 | 1.18 | 1.42 | 0.86 | 0.00 | 0.11 |
| Calves | 0.00 | 0.00 | 0.00 | 0.11 | 1.90 | 2.68 | 0.00 | 0.64 |
| Sheep | 1.42 | 0.64 | 4.27 | 2.47 | 3.32 | 2.47 | 4.27 | 2.04 |
| Goats | 1.90 | 2.14 | 12.32 | 11.04 | 14.22 | 10.72 | 15.17 | 9.65 |
| Donkeys | 0.95 | 1.39 | 1.42 | 0.54 | 0.95 | 0.54 | 0.00 | 0.00 |
| Horses | 0.00 | 0.11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Mules | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Camels | 0.47 | 0.43 | 0.00 | 0.21 | 0.00 | 0.21 | 0.00 | 0.00 |
| Chickens | 5.69 | 6.00 | 7.11 | 6.97 | 11.85 | 15.22 | 15.17 | 15.11 |
| Pigs | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Beehives | 0.00 | 0.00 | 0.00 | 0.11 | 0.00 | 0.21 | 0.00 | 0.00 |
| Overall | 16.59 | 17.58 | 53.55 | 39.87 | 41.23 | 42.98 | 36.02 | 29.37 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.86. Common feeds utilized by households in Tigray region (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)

| Feed type | Livestock feed utilization practice by administrative zone | | | | | | |
|---|---|---|---|---|---|---|---|
| | Southern | South east | Eastern | Central | Western | North west | Overall |
| Infant town | | | | | | | |
| Crop residues | 72.63 | 84.44 | 70.00 | 72.83 | 88.64 | 87.20 | 81.29 |
| Natural grazing | 25.26 | 11.11 | 24.67 | 6.52 | 53.41 | 62.56 | 39.01 |
| Hay | 14.74 | 17.78 | 23.33 | 25.00 | 89.77 | 82.46 | 62.42 |
| Green fodder | 9.47 | 15.56 | 14.67 | 9.78 | 23.86 | 30.33 | 19.12 |
| Industrial by-products | 3.16 | 11.11 | 32.67 | 13.04 | 15.34 | 14.69 | 15.86 |
| Other feeds | 12.63 | 6.67 | 9.33 | 7.61 | 7.39 | 6.16 | 10.14 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Rural | | | | | | | |
| Crop residues | 81.32 | 87.39 | 73.36 | 85.36 | 88.45 | 96.78 | 92.69 |
| Natural grazing | 34.94 | 29.35 | 21.85 | 15.28 | 64.44 | 63.34 | 33.64 |
| Hay | 22.74 | 28.70 | 30.77 | 37.46 | 83.59 | 90.35 | 54.77 |
| Green fodder | 11.31 | 8.91 | 12.82 | 13.15 | 31.00 | 27.97 | 16.37 |
| Industrial by-products | 3.56 | 6.09 | 13.27 | 2.84 | 8.21 | 5.89 | 6.30 |
| Other feeds | 5.97 | 7.83 | 9.81 | 2.35 | 3.34 | 4.39 | 5.38 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.87. Source of animal feed as per the sampled livestock holders of Tigray (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)

| Feed type | Southern | | | | South east | | | | Eastern | | | | Central | | | | Western | | | | North west | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | S | P | C | O | S | P | C | O | S | P | C | O | S | P | C | O | S | P | C | O | S | P | C | O |
| Infant town | | | | | | | | | | | | | | | | | | | | | | | | |
| Crop residues | 88 | 20 | 8 | 2 | 87 | 29 | 13 | 3 | - | - | - | - | - | - | - | - | 87 | 22 | 15 | 6 | 100 | 13 | 16 | 4 |
| Natural grazing | 66 | 29 | 33 | 8 | 100 | 20 | 40 | 20 | - | - | - | - | - | - | - | - | 100 | 14 | 55 | 21 | 100 | 14 | 52 | 17 |
| Hay | 57 | 7 | 7 | 0 | 25 | 13 | 0 | 0 | - | - | - | - | - | - | - | - | 82 | 16 | 19 | 12 | 98 | 7 | 12 | 5 |
| Green fodder | 22 | 11 | 22 | 0 | 0 | 0 | 0 | 14 | - | - | - | - | - | - | - | - | 100 | 24 | 76 | 7 | 100 | 45 | 41 | 0 |
| Industrial by-products | 33 | 100 | 0 | 0 | 12 | 100 | 0 | 0 | - | - | - | - | - | - | - | - | 37 | 100 | 15 | 0 | 0 | 48 | 6 | 0 |
| Other feeds | 16 | 16 | 0 | 0 | 100 | 33 | 0 | 0 | - | - | - | - | - | - | - | - | 23 | 62 | 23 | 0 | 0 | 62 | 15 | 0 |
| Rural | | | | | | | | | | | | | | | | | | | | | | | | |
| Crop residues | 96 | 8 | 17 | 3 | 100 | 9 | 18 | 2 | - | - | - | - | - | - | - | - | 86 | 16 | 12 | 6 | 97 | 8 | 15 | 4 |
| Natural grazing | 61 | 5 | 48 | 10 | 67 | 6 | 53 | 3 | - | - | - | - | - | - | - | - | 100 | 19 | 43 | 22 | 100 | 11 | 45 | 18 |
| Hay | 36 | 6 | 11 | 2 | 36 | 7 | 10 | 2 | - | - | - | - | - | - | - | - | 83 | 13 | 14 | 7 | 93 | 8 | 12 | 4 |
| Green fodder | 83 | 6 | 22 | 4 | 100 | 2 | 34 | 0 | - | - | - | - | - | - | - | - | 35 | 7 | 2 | 1 | 100 | 10 | 41 | 22 |
| Industrial by-products | 39 | 61 | 7 | 4 | 32 | 68 | 4 | 0 | - | - | - | - | - | - | - | - | 0 | 74 | 37 | 0 | 0 | 38 | 13 | 4 |
| Other feeds | 36 | 32 | 15 | 6 | 39 | 42 | 11 | 3 | - | - | - | - | - | - | - | - | 0 | 100 | 100 | 0 | 24 | 46 | 22 | 5 |

N = Total number of respondents; HOUSEHOLDs = Households; S= Self-produced; P= purchased; C= communal source; O= other source

Appendix Table 3.3.88. Households who utilize industrial by-products as animal feed source in Tigray by zone (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)

| Use of industrial by-products | Utilization of industrial by-products by administrative zone | | | | | | |
|---|---|---|---|---|---|---|---|
| | Southern | South east | Eastern | Central | Western | North west | Overall |
| Infant town | | | | | | | |
| Yes | 9.47 | 15.56 | 38.67 | 14.13 | 10.80 | 9.00 | 16.25 |
| No | 90.53 | 84.44 | 61.33 | 85.87 | 89.20 | 91.00 | 83.75 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Rural | | | | | | | |
| Yes | 6.86 | 5.87 | 18.51 | 4.69 | 15.50 | 7.61 | 9.04 |
| No | 93.14 | 94.13 | 81.49 | 95.31 | 84.50 | 92.39 | 90.96 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.89. Households who grow and use improved animal fodder in Tigray region by zone (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)

| Farmers grow improved fodder | Administrative zone | | | | | | |
|---|---|---|---|---|---|---|---|
| | Southern | South east | Eastern | Central | Western | North west | Overall |
| Infant town | | | | | | | |
| Yes | 1.05 | 0.00 | 4.67 | 0.00 | 1.14 | 1.90 | 1.82 |
| No | 98.95 | 100.00 | 95.33 | 100.00 | 98.86 | 98.10 | 98.18 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Rural | | | | | | | |
| Yes | 2.29 | 1.52 | 2.34 | 1.35 | 1.22 | 2.14 | 1.85 |
| No | 97.71 | 98.48 | 97.66 | 98.65 | 98.78 | 97.86 | 98.15 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Farmers started feeding improved fodder to animals | | | | | | | |
| Infant town | | | | | | | |
| Yes | 0.00 | 0.00 | 100.00 | 0.00 | 100.00 | 100.00 | 92.86 |
| No | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 7.14 |
| Total (N) | 100.00 | 0.00 | 100.00 | 0.00 | 100.00 | 100.00 | 100.00 |
| Rural | | | | | | | |
| Yes | 73.33 | 57.14 | 83.33 | 78.95 | 100.00 | 77.78 | 82.02 |
| No | 26.67 | 42.86 | 16.67 | 21.05 | 0.00 | 22.22 | 17.98 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.90. Livestock households owing private and communal grazing in Tigray region by zone (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)

| Farmers having private grazing land | Ownership of grazing lands by administrative zone | | | | | | |
|---|---|---|---|---|---|---|---|
| | Southern | South east | Eastern | Central | Western | North west | Overall |
| Infant town | | | | | | | |
| Yes | 15.79 | 4.44 | 17.33 | 7.61 | 12.50 | 12.50 | 13.78 |
| No | 84.21 | 95.56 | 82.67 | 92.39 | 87.50 | 87.50 | 86.22 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Rural | | | | | | | |
| Yes | 6.61 | 2.17 | 24.75 | 11.15 | 16.72 | 16.72 | 13.56 |
| No | 93.39 | 97.83 | 75.25 | 88.85 | 83.28 | 83.28 | 86.44 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Farmers having communal grazing land | | | | | | | |
| Infant town | | | | | | | |
| Yes | 50.53 | 40.00 | 26.00 | 21.74 | 69.89 | 72.99 | 52.28 |
| No | 49.47 | 60.00 | 74.00 | 78.26 | 30.11 | 27.01 | 47.72 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Rural | | | | | | | |
| Yes | 63.91 | 52.61 | 27.09 | 24.08 | 79.33 | 71.06 | 46.76 |
| No | 36.09 | 47.39 | 72.91 | 75.92 | 20.67 | 28.94 | 53.24 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.91. Average, minimum and maximum private grazing land holding size of holders in Tigray region by zone (N = 759 HOUSEHOLDs)

| Grazing size (ha/HOUSEHOLD) | Size of private grazing lands by administrative zone | | | | | | |
|---|---|---|---|---|---|---|---|
| | Southern | South east | Eastern | Central | Western | North west | Overall |
| Infant town | | | | | | | |
| Average | 0.000 | 0.002 | 0.043 | 0.013 | 0.025 | 0.029 | 0.024 |
| Minimum | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Maximum | 0.000 | 0.125 | 0.250 | 0.250 | 2.500 | 3.750 | 3.750 |
| Rural | | | | | | | |
| Average | 0.000 | 0.001 | 0.059 | 0.030 | 0.004 | 0.006 | 0.021 |
| Minimum | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Maximum | 0.000 | 0.250 | 1.000 | 2.000 | 0.500 | 0.750 | 2.000 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.92. Farmers who face feed shortage in rural areas of Tigray region by zone (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)

| Farmers face feed shortage | Administrative zone | | | | | | |
|---|---|---|---|---|---|---|---|
| | Southern | South east | Eastern | Central | Western | North west | Overall |
| Infant town | | | | | | | |
| Yes | 35.79 | 11.11 | 50.00 | 40.22 | 27.27 | 24.17 | 32.51 |
| No | 64.21 | 88.89 | 50.00 | 59.78 | 72.73 | 75.83 | 67.49 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Rural | | | | | | | |
| Yes | 31.00 | 30.43 | 50.72 | 40.27 | 17.93 | 21.44 | 34.59 |
| No | 69.00 | 69.57 | 49.28 | 59.73 | 82.07 | 78.56 | 65.41 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.93. Farmers who purchase animal feed to solve feed shortage in Tigray region by zone (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)

| Farmers buy animal feed | Administrative zone | | | | | | |
|---|---|---|---|---|---|---|---|
| | Southern | South east | Eastern | Central | Western | North west | Overall |
| Infant town | | | | | | | |
| Yes | 48.42 | 35.56 | 59.33 | 39.13 | 40.34 | 27.96 | 41.22 |
| No | 51.58 | 64.44 | 40.67 | 60.87 | 59.66 | 72.04 | 58.78 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Rural | | | | | | | |
| Yes | 29.61 | 31.30 | 41.03 | 35.44 | 31.31 | 23.58 | 32.55 |
| No | 70.39 | 68.70 | 58.97 | 64.56 | 68.69 | 76.42 | 67.45 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.94. Animal housing methods being practiced by farmers in Tigray region by zone (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)

| Animal housing methods | Animal housing system by administrative zone | | | | | | |
|---|---|---|---|---|---|---|---|
| | Southern | South east | Eastern | Central | Western | North west | Overall |
| Infant town | | | | | | | |
| No house (open housing) | 31.58 | 8.89 | 10.67 | 7.61 | 32.95 | 28.91 | 22.89 |
| Housed in shed | 12.63 | 28.89 | 29.33 | 16.30 | 11.93 | 11.37 | 16.78 |
| Housed in paddocks | 37.89 | 57.78 | 60.00 | 57.61 | 35.80 | 51.66 | 48.37 |
| Housed in fences or corals | 16.84 | 20.00 | 15.33 | 18.48 | 17.05 | 17.54 | 17.30 |
| Housed in basket | 0.00 | 4.44 | 1.33 | 0.00 | 7.95 | 9.48 | 3.38 |
| Housed inside the home (with family) | 9.47 | 6.67 | 15.33 | 11.96 | 18.18 | 19.91 | 15.60 |
| Housed in kitchen | 1.05 | 4.44 | 0.67 | 0.00 | 0.57 | 0.00 | 0.65 |
| Other | 4.21 | 0.00 | 1.33 | 3.26 | 1.70 | 3.32 | 2.47 |
| Rural | | | | | | | |
| No house (open housing) | 30.88 | 23.26 | 10.81 | 17.34 | 38.91 | 35.58 | 23.91 |
| Housed in shed | 15.76 | 20.22 | 26.76 | 24.31 | 11.85 | 12.43 | 19.82 |
| Housed in paddocks | 37.99 | 45.00 | 66.11 | 56.22 | 47.42 | 47.80 | 51.77 |
| Housed in fences or corals | 21.47 | 26.96 | 15.61 | 18.05 | 20.97 | 17.68 | 19.13 |
| Housed in basket | 0.25 | 1.74 | 0.33 | 0.78 | 2.74 | 4.61 | 1.58 |
| Housed inside the home (with family) | 7.24 | 5.87 | 14.05 | 15.92 | 9.12 | 18.44 | 13.29 |
| Housed in kitchen | 1.14 | 2.83 | 0.56 | 0.71 | 0.30 | 0.32 | 0.85 |
| Other | 2.41 | 0.65 | 0.89 | 1.28 | 1.22 | 1.50 | 1.37 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.95. Sources of drinking water for animals in dry and wet seasons in Tigray region by zone (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)

| Source of water | Source of drinking water by administrative zone | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Southern | | South east | | Eastern | | Central | | Western | | North west | | Overall | |
| | DS | WS | DS | WS | DS | WS | DS | WS | DS | WS | DS | WS | DS | WS |
| Infant town | | | | | | | | | | | | | | |
| Bore hole | - | - | - | - | 11.33 | 6.67 | 3.26 | 8.70 | 14.20 | - | 9.48 | - | 11.61 | 5.46 |
| Dam/pond | - | - | - | - | 9.33 | 12.00 | 3.26 | 2.17 | 1.14 | - | 1.90 | - | 3.99 | 5.46 |
| Well | - | - | - | - | 12.67 | 4.00 | 4.35 | 2.17 | 19.32 | - | 40.76 | - | 24.78 | 3.25 |
| River/spring/stream | - | - | - | - | 30.00 | 31.33 | 26.09 | 25.00 | 36.36 | - | 36.49 | - | 36.40 | 48.63 |
| Rain water harvesting | - | - | - | - | 2.00 | 1.33 | 4.35 | 7.61 | 0.00 | - | 0.95 | - | 0.69 | 1.43 |
| Pump | - | - | - | - | 50.00 | 31.33 | 58.70 | 38.04 | 26.14 | - | 7.58 | - | 33.10 | 19.64 |
| Reservoir/Horeye | - | - | - | - | 1.33 | 4.00 | 0.00 | 2.17 | 0.57 | - | 0.95 | - | 0.87 | 4.03 |
| Surface water | - | - | - | - | 3.33 | 8.00 | 0.00 | 7.61 | 2.84 | - | 1.42 | - | 2.25 | 8.84 |
| Other source | - | - | - | - | 2.67 | 1.33 | 4.35 | 4.35 | 7.39 | - | 6.16 | - | 5.55 | 3.25 |
| Rural | | | | | | | | | | | | | | |
| Bore hole | - | - | - | - | 11.37 | 14.05 | 7.32 | 11.23 | 17.93 | - | 11.58 | - | 10.31 | 8.91 |
| Dam/pond | - | - | - | - | 9.48 | 7.13 | 4.34 | 5.19 | 2.74 | - | 1.71 | - | 4.74 | 5.09 |
| Well | - | - | - | - | 10.93 | 4.12 | 10.38 | 4.90 | 21.88 | - | 35.05 | - | 17.82 | 3.78 |
| River/spring/stream | - | - | - | - | 45.37 | 34.56 | 65.39 | 46.70 | 53.50 | - | 44.59 | - | 53.20 | 50.29 |
| Rain water harvesting | - | - | - | - | 0.67 | 2.12 | 0.50 | 1.35 | 0.00 | - | 0.21 | - | 0.42 | 1.08 |
| Pump | - | - | - | - | 28.32 | 14.60 | 17.34 | 8.39 | 7.29 | - | 5.79 | - | 15.96 | 8.37 |
| Reservoir/Horeye | - | - | - | - | 4.68 | 8.03 | 1.28 | 6.47 | 0.61 | - | 0.32 | - | 1.80 | 8.02 |
| Surface water | - | - | - | - | 2.45 | 13.38 | 1.78 | 14.36 | 1.52 | - | 1.18 | - | 1.75 | 12.96 |
| Other source | - | - | - | - | 2.90 | 1.67 | 1.85 | 1.28 | 1.82 | - | 3.22 | - | 2.44 | 1.50 |

N = Total number of respondents; HOUSEHOLDs = Households; DS = Dry season; WS = Wet season

Appendix Table 3.3.96. Animal watering frequency in dry and wet seasons in Tigray region by zone (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)

| Watering frequency | Watering frequency by administrative zone | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Southern | | South east | | Eastern | | Central | | Western | | North west | | Overall | |
| | DS | WS | DS | WS | DS | WS | DS | WS | DS | WS | DS | WS | DS | WS |
| Infant town | | | | | | | | | | | | | | |
| Free available | - | 64.21 | - | 51.11 | - | 59.33 | - | 66.30 | - | 64.77 | - | 66.35 | - | 63.46 |
| Once a day | - | 33.68 | - | 28.89 | - | 30.00 | - | 25.00 | - | 32.39 | - | 30.33 | - | 30.43 |
| Twice a day | - | 1.05 | - | 11.11 | - | 6.00 | - | 4.35 | - | 2.27 | - | 0.95 | - | 3.25 |
| Three times a day | - | 1.05 | - | 6.67 | - | 2.00 | - | 2.17 | - | 0.00 | - | 0.00 | - | 1.17 |
| Once in two or more days | - | 0.00 | - | 2.22 | - | 2.00 | - | 0.00 | - | 0.57 | - | 0.95 | - | 0.91 |
| Other | - | 0.00 | - | 0.00 | - | 0.67 | - | 2.17 | - | 0.00 | - | 1.42 | - | 0.78 |
| Total (N) | - | 100.00 | - | 100.00 | - | 100.00 | - | 100.00 | - | 100.00 | - | 100.00 | - | 100.00 |
| Rural | | | | | | | | | | | | | | |
| Free available | - | 60.48 | - | 58.70 | - | 53.73 | - | 52.70 | - | 63.83 | - | 69.67 | - | 58.79 |
| Once a day | - | 31.89 | - | 33.48 | - | 35.23 | - | 37.86 | - | 32.83 | - | 26.69 | - | 33.46 |
| Twice a day | - | 4.57 | - | 2.39 | - | 3.79 | - | 4.19 | - | 2.43 | - | 1.61 | - | 3.39 |
| Three times a day | - | 0.64 | - | 1.30 | - | 0.45 | - | 0.50 | - | 0.30 | - | 0.32 | - | 0.54 |
| Once in two or more days | - | 2.03 | - | 3.91 | - | 5.69 | - | 3.91 | - | 0.30 | - | 0.64 | - | 3.05 |
| Other | - | 0.38 | - | 0.22 | - | 1.11 | - | 0.85 | - | 0.30 | - | 1.07 | - | 0.77 |
| Total (N) | - | 100.00 | - | 100.00 | - | 100.00 | - | 100.00 | - | 100.00 | - | 100.00 | - | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households; DS = Dry season; WS = Wet season

Appendix Table 3.3.97. Livestock farmers who incur expenses for watering animals in dry and wet seasons in Tigray region by zone (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)

| Farmers incur for animal watering | Administrative zone | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Southern | | South east | | Eastern | | Central | | Western | | North west | | Overall | |
| | DS | WS | DS | WS | DS | WS | DS | WS | DS | WS | DS | WS | DS | WS |
| Infant town | | | | | | | | | | | | | | |
| Yes | 30.53 | 10.53 | 22.22 | 13.33 | 25.33 | 14.00 | 23.91 | 6.52 | 24.43 | 6.25 | 6.64 | 1.90 | 20.29 | 7.54 |
| No | 69.47 | 89.47 | 77.78 | 86.67 | 74.67 | 86.00 | 76.09 | 93.48 | 75.57 | 93.75 | 93.36 | 98.10 | 79.71 | 92.46 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Rural | | | | | | | | | | | | | | |
| Yes | 17.03 | 5.72 | 8.04 | 2.17 | 11.48 | 6.35 | 6.11 | 2.84 | 5.47 | 1.22 | 5.04 | 2.25 | 8.83 | 3.68 |
| No | 82.97 | 94.28 | 91.96 | 97.83 | 88.52 | 93.65 | 93.89 | 97.16 | 94.53 | 98.78 | 94.96 | 97.75 | 91.17 | 96.32 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households; DS = Dry season; WS = Wet season

Appendix Table 3.3.98. Distance (km) travelled by animals to water source in Tigray region by zone (N = 5582 HOUSEHOLDs)

| Distance to water source (km) | Distance travelled by animals by administrative zone | | | | | | |
|---|---|---|---|---|---|---|---|
| | Southern | South east | Eastern | Central | Western | North west | Overall |
| Infant town | | | | | | | |
| Average | 3.414 | 1.672 | 2.713 | 1.127 | 3.060 | 3.213 | 2.76 |
| Minimum | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| Maximum | 30.000 | 10.000 | 30.000 | 15.000 | 30.000 | 30.000 | 30.00 |
| Rural | | | | | | | |
| Average | 4.357 | 3.501 | 3.448 | 2.973 | 3.094 | 2.913 | 3.33 |
| Minimum | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| Maximum | 30.000 | 20.000 | 30.00 | 30.000 | 30.000 | 30.000 | 30.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.99. Distance travelled by animals to water source in Tigray by zone (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)

| Distance to water source (km) | Distance travelled by animals by administrative zone | | | | | | |
|---|---|---|---|---|---|---|---|
| | Southern | South east | Eastern | Central | Western | North west | Overall |
| Infant town | | | | | | | |
| 0.00 – 1.00 | 57.89 | 64.44 | 66.67 | 76.09 | 56.25 | 50.71 | 49.34 |
| 1.10 – 5.00 | 27.37 | 28.89 | 24.00 | 21.74 | 24.43 | 34.12 | 34.88 |
| 5.10 – 10.00 | 6.32 | 6.67 | 2.00 | 1.09 | 13.64 | 8.06 | 8.97 |
| 10.10 – 20.00 | 3.16 | 0.00 | 4.67 | 1.09 | 3.41 | 4.74 | 4.49 |
| > 20 | 4.21 | 0.00 | 2.00 | 0.00 | 1.70 | 1.90 | 2.33 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Rural | | | | | | | |
| 0.00 – 1.00 | 50.70 | 43.48 | 54.07 | 51.24 | 51.37 | 46.30 | 52.57 |
| 1.10 – 5.00 | 29.61 | 38.26 | 31.66 | 36.46 | 32.52 | 39.66 | 34.44 |
| 5.10 – 10.00 | 5.34 | 9.13 | 4.79 | 5.54 | 9.12 | 9.11 | 6.55 |
| 10.10 – 20.00 | 7.75 | 5.00 | 3.01 | 3.20 | 4.26 | 3.00 | 4.05 |
| > 20 | 4.45 | 1.74 | 3.79 | 1.71 | 1.52 | 1.18 | 2.39 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.100. Animals vaccinated against common diseases in Tigray by zone (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)

| Animal type | Animals vaccinated against common diseases by administrative zone | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Southern | | South east | | Eastern | | Central | | Western | | North west | | Overall | |
| | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No |
| Infant town | | | | | | | | | | | | | | |
| Cattle | 69.84 | 30.16 | 89.66 | 10.34 | 61.64 | 38.36 | 54.05 | 45.95 | 91.51 | 8.49 | 87.50 | 12.50 | 79.49 | 20.51 |
| Sheep | 55.56 | 44.44 | 80.00 | 20.00 | 58.82 | 41.18 | 50.00 | 50.00 | 92.11 | 7.89 | 77.27 | 22.73 | 75.76 | 24.24 |
| Goats | 83.33 | 16.67 | 60.00 | 40.00 | 80.00 | 20.00 | 66.67 | 33.33 | 89.47 | 10.53 | 80.26 | 19.74 | 81.62 | 18.38 |
| Equine | 20.00 | 80.00 | 15.00 | 85.00 | 37.50 | 62.50 | 44.44 | 55.56 | 47.69 | 52.31 | 36.46 | 63.54 | 37.05 | 62.95 |
| Rural | | | | | | | | | | | | | | |
| Cattle | 76.74 | 23.26 | 70.45 | 29.55 | 59.02 | 40.98 | 55.26 | 44.74 | 84.94 | 15.06 | 84.64 | 15.36 | 70.36 | 29.64 |
| Sheep | 74.36 | 25.64 | 76.09 | 23.91 | 60.99 | 39.01 | 66.67 | 33.33 | 66.67 | 33.33 | 82.05 | 17.95 | 68.69 | 31.31 |
| Goats | 73.17 | 26.83 | 60.42 | 39.58 | 56.00 | 44.00 | 66.47 | 33.53 | 83.87 | 16.13 | 77.53 | 22.47 | 70.97 | 29.03 |
| Equine | 29.86 | 70.14 | 24.17 | 75.83 | 33.66 | 66.34 | 32.39 | 67.61 | 30.23 | 69.77 | 29.25 | 70.75 | 29.75 | 70.25 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.101. Animals sprayed against external parasites in Tigray by zone (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)

| Animal type | Animals sprayed against external parasites by administrative zone | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Southern | | South east | | Eastern | | Central | | Western | | North west | | Overall | |
| | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No |
| Infant town | | | | | | | | | | | | | | |
| Cattle | 44.83 | 55.17 | 28.57 | 71.43 | 72.50 | 27.50 | 70.00 | 30.00 | 41.35 | 58.65 | 38.46 | 61.54 | 71.67 | 28.33 |
| Sheep | 22.22 | 77.78 | 50.00 | 50.00 | 70.00 | 30.00 | 80.00 | 20.00 | 62.50 | 37.50 | 0.00 | 0.00 | 68.60 | 31.40 |
| Goats | 50.00 | 50.00 | 0.00 | 100.00 | 60.00 | 40.00 | 20.00 | 80.00 | 57.14 | 42.86 | 60.00 | 40.00 | 67.94 | 32.06 |
| Equine | 0.00 | 100.00 | 15.38 | 84.62 | 43.75 | 56.25 | 28.57 | 71.43 | 0.00 | 100.00 | 100.00 | 0.00 | 34.07 | 65.93 |
| Rural | | | | | | | | | | | | | | |
| Cattle | 53.24 | 46.76 | 44.48 | 55.52 | 56.11 | 43.89 | 62.07 | 37.93 | 42.06 | 57.94 | 37.39 | 62.61 | 74.89 | 25.11 |
| Sheep | 48.37 | 51.63 | 46.51 | 53.49 | 60.00 | 40.00 | 62.57 | 37.43 | 50.00 | 50.00 | 30.00 | 70.00 | 77.12 | 22.88 |
| Goats | 44.00 | 56.00 | 32.61 | 67.39 | 58.33 | 41.67 | 62.81 | 37.19 | 75.00 | 25.00 | 27.27 | 72.73 | 72.35 | 27.65 |
| Equine | 31.58 | 68.42 | 22.54 | 77.46 | 33.33 | 66.67 | 33.75 | 66.25 | 0.00 | 100.00 | 0.00 | 100.00 | 35.32 | 64.68 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.102. Animals dewormed against internal parasites in Tigray by zone (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)

| Animal type | Animals dewormed against internal parasites by administrative zone | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Southern | | South east | | Eastern | | Central | | Western | | North west | | Overall | |
| | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No |
| Infant town | | | | | | | | | | | | | | |
| Cattle | 81.03 | 18.97 | 85.71 | 14.29 | 92.50 | 7.50 | 75.00 | 25.00 | 60.58 | 39.42 | 67.31 | 32.69 | 44.33 | 55.67 |
| Sheep | 66.67 | 33.33 | 100.00 | 0.00 | 70.00 | 30.00 | 80.00 | 20.00 | 81.08 | 18.92 | 38.10 | 61.90 | 56.82 | 43.18 |
| Goats | 100.00 | 0.00 | 75.00 | 25.00 | 80.00 | 20.00 | 60.00 | 40.00 | 72.97 | 27.03 | 62.16 | 37.84 | 43.75 | 56.25 |
| Equine | 42.86 | 57.14 | 15.38 | 84.62 | 31.25 | 68.75 | 42.86 | 57.14 | 42.86 | 57.14 | 31.58 | 68.42 | 25.53 | 74.47 |
| Rural | | | | | | | | | | | | | | |
| Cattle | 84.54 | 15.46 | 82.92 | 17.08 | 76.47 | 23.53 | 79.60 | 20.40 | 59.66 | 40.34 | 66.37 | 33.63 | 47.96 | 52.04 |
| Sheep | 79.74 | 20.26 | 83.72 | 16.28 | 79.35 | 20.65 | 79.68 | 20.32 | 50.00 | 50.00 | 66.67 | 33.33 | 55.96 | 44.04 |
| Goats | 81.33 | 18.67 | 78.26 | 21.74 | 77.08 | 22.92 | 83.47 | 16.53 | 64.84 | 35.16 | 59.84 | 40.16 | 54.93 | 45.07 |
| Equine | 43.61 | 56.39 | 32.39 | 67.61 | 48.00 | 52.00 | 32.50 | 67.50 | 26.56 | 73.44 | 30.93 | 69.07 | 29.03 | 70.97 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.103. Households who faced animal illness in the past 12 months (March 2017- April 2018) in Tigray by zone (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)

| Animal type | Animal illness occurrence by administrative zone | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Southern | | South east | | Eastern | | Central | | Western | | North west | | Overall | |
| | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No |
| Infant town | | | | | | | | | | | | | | |
| Cattle | 35.71 | 73.68 | 10.00 | 90.91 | 7.37 | 93.14 | 3.70 | 96.43 | 27.45 | 78.46 | 21.15 | 82.54 | 15.87 | 84.13 |
| Sheep | 10.53 | 90.48 | 0.00 | 100.00 | 2.22 | 97.83 | 0.00 | 100.00 | 27.50 | 78.43 | 23.08 | 81.25 | 10.75 | 89.25 |
| Goats | 50.00 | 66.67 | 33.33 | 75.00 | 14.29 | 87.50 | 0.00 | 100.00 | 38.10 | 72.41 | 32.43 | 75.51 | 24.08 | 75.92 |
| Equine | 0.00 | 100.00 | 5.00 | 95.24 | 7.69 | 92.86 | 0.00 | 100.00 | 2.74 | 97.33 | 4.42 | 95.76 | 3.50 | 96.50 |
| Chicken | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Rural | | | | | | | | | | | | | | |
| Cattle | 16.83 | 83.17 | 7.56 | 92.44 | 6.17 | 93.83 | 4.48 | 95.52 | 14.71 | 85.29 | 16.65 | 83.35 | 10.27 | 89.73 |
| Sheep | 15.16 | 84.84 | 5.26 | 94.74 | 5.49 | 94.51 | 9.94 | 90.06 | 9.30 | 90.70 | 13.18 | 86.82 | 9.69 | 90.31 |
| Goats | 13.39 | 86.61 | 6.17 | 93.83 | 6.85 | 93.15 | 10.50 | 89.50 | 23.48 | 76.52 | 21.73 | 78.27 | 14.34 | 85.66 |
| Equine | 5.09 | 94.91 | 1.12 | 98.88 | 0.46 | 99.54 | 0.50 | 99.50 | 2.96 | 97.04 | 2.38 | 97.62 | 1.84 | 98.16 |
| Chicken | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.104. Households who faced animal death in the past 12 months (March 2017- April 2018) in Tigray by zone (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)

| Animal type | Animal death occurrence by administrative zone | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Southern | | South east | | Eastern | | Central | | Western | | North west | | Overall | |
| | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No |
| Infant town | | | | | | | | | | | | | | |
| Cattle | 10.14 | 90.79 | 3.13 | 96.97 | 0.00 | 100.00 | 3.70 | 96.43 | 14.04 | 87.69 | 11.83 | 89.42 | 7.85 | 92.15 |
| Sheep | 10.53 | 90.48 | 16.67 | 85.71 | 2.22 | 97.83 | 0.00 | 100.00 | 18.60 | 84.31 | 24.00 | 80.65 | 9.68 | 90.32 |
| Goats | 28.57 | 77.78 | 33.33 | 75.00 | 14.29 | 87.50 | 0.00 | 100.00 | 28.89 | 77.59 | 36.11 | 73.47 | 23.04 | 76.96 |
| Equine | 0.00 | 100.00 | 5.00 | 95.24 | 0.00 | 100.00 | 0.00 | 100.00 | 0.00 | 100.00 | 3.51 | 96.61 | 1.59 | 98.41 |
| Chicken | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Rural | | | | | | | | | | | | | | |
| Cattle | 4.85 | 95.15 | 3.53 | 96.47 | 3.08 | 96.92 | 2.24 | 97.76 | 10.13 | 89.87 | 9.50 | 90.50 | 4.96 | 4.96 |
| Sheep | 11.89 | 88.11 | 5.26 | 94.74 | 6.87 | 93.13 | 14.09 | 85.91 | 6.98 | 93.02 | 16.28 | 83.72 | 10.92 | 10.92 |
| Goats | 11.81 | 88.19 | 11.11 | 88.89 | 5.48 | 94.52 | 12.10 | 87.90 | 23.48 | 76.52 | 20.94 | 79.06 | 14.76 | 14.76 |
| Equine | 0.00 | 100.00 | 1.12 | 98.88 | 0.23 | 99.77 | 0.34 | 99.66 | 2.17 | 97.83 | 1.94 | 98.06 | 0.83 | 0.83 |
| Chicken | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.105. Households who practice traditional animal medication and its effectiveness in Tigray by zone (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)

| Use traditional animal medication | Animal medication practice by administrative zone | | | | | | |
|---|---|---|---|---|---|---|---|
| | Southern | South east | Eastern | Central | Western | North west | Overall |
| Infant town | | | | | | | |
| Yes | 13.79 | 6.90 | 1.54 | 7.41 | 8.65 | 10.90 | 8.88 |
| No | 86.21 | 93.10 | 98.46 | 92.59 | 91.35 | 89.10 | 91.12 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Rural | | | | | | | |
| Yes | 11.51 | 8.87 | 11.32 | 11.39 | 7.30 | 10.19 | 10.37 |
| No | 88.49 | 91.13 | 88.68 | 88.61 | 92.70 | 89.81 | 89.63 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Effectiveness of traditional animal medication | | | | | | | |
| Infant town | | | | | | | |
| Effective | 87.50 | 100.00 | 100.00 | 100.00 | 100.00 | 88.24 | 92.31 |
| Not effective | 12.50 | 0.00 | 0.00 | 0.00 | 0.00 | 11.76 | 7.69 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Rural | | | | | | | |
| Effective | 7.83 | 84.00 | 76.67 | 84.44 | 94.12 | 90.00 | 86.29 |
| Not effective | 1.18 | 16.00 | 23.33 | 15.56 | 5.88 | 10.00 | 13.71 |
| Total (N) | 9.01 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.106. Livestock farmers who practice controlled animal breeding method in Tigray by zone (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)

| Practicing controlled breeding | Administrative zone | | | | | | |
|---|---|---|---|---|---|---|---|
| | Southern | South east | Eastern | Central | Western | North west | Overall |
| Infant town | | | | | | | |
| Yes | 16.84 | 8.89 | 29.33 | 18.48 | 32.39 | 35.55 | 27.70 |
| No | 83.16 | 91.11 | 70.67 | 81.52 | 67.61 | 64.45 | 72.30 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Rural | | | | | | | |
| Yes | 12.20 | 11.74 | 21.07 | 18.39 | 34.04 | 30.87 | 20.73 |
| No | 87.80 | 88.26 | 78.93 | 81.61 | 65.96 | 69.13 | 79.27 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.107. Livestock breeding methods being practiced by farmers of Tigray by zone (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)

| Breeding methods | Livestock breeding methods by administrative zone | | | | | | |
|---|---|---|---|---|---|---|---|
| | Southern | South east | Eastern | Central | Western | North west | Overall |
| Infant town | | | | | | | |
| Natural mating (sire selected from own herd/flock) | 50.00 | 0.00 | 47.73 | 47.06 | 54.39 | 69.33 | 56.81 |
| Natural mating (sire purchased or exchanged) | 12.50 | 0.00 | 22.73 | 29.41 | 22.81 | 14.67 | 24.88 |
| Natural mating (sire from village or neighbor) | 18.75 | 25.00 | 13.64 | 17.65 | 45.61 | 44.00 | 30.99 |
| Natural mating (non-breeding males castrated) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.88 |
| Natural mating (dam purchased) | 0.00 | 0.00 | 6.82 | 5.88 | 1.75 | 1.33 | 5.16 |
| Artificial insemination (AI) | 18.75 | 75.00 | 31.82 | 11.76 | 7.02 | 1.33 | 7.52 |
| Other breeding method | 0.00 | 0.00 | 4.55 | 0.00 | 1.75 | 1.33 | 4.69 |
| Rural | | | | | | | |
| Natural mating (sire selected from own herd/flock) | 59.38 | 74.07 | 53.97 | 66.80 | 57.14 | 68.75 | 63.63 |
| Natural mating (sire purchased or exchanged) | 16.67 | 29.63 | 28.57 | 22.01 | 11.61 | 13.89 | 19.84 |
| Natural mating (sire from village or neighbor) | 22.92 | 40.74 | 21.69 | 14.29 | 44.64 | 45.14 | 30.16 |
| Natural mating (non-breeding males castrated) | 5.21 | 12.96 | 1.06 | 1.93 | 1.79 | 0.35 | 2.61 |
| Natural mating (dam purchased) | 5.21 | 3.70 | 4.23 | 5.02 | 0.89 | 1.04 | 3.71 |
| Artificial insemination (AI) | 18.75 | 14.81 | 11.64 | 7.34 | 8.93 | 2.08 | 3.64 |
| Other breeding method | 3.13 | 0.00 | 0.53 | 0.00 | 1.79 | 0.69 | 1.50 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.108. Livestock farmers who incur cost for animal breeding/mating in Tigray by zone (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)

| Farmers pay for animal breeding | Administrative zone | | | | | | |
|---|---|---|---|---|---|---|---|
| | Southern | South east | Eastern | Central | Western | North west | Overall |
| Infant town | | | | | | | |
| Yes | 0.00 | 6.67 | 10.67 | 1.09 | 3.41 | 0.95 | 3.64 |
| No | 100.00 | 93.33 | 89.33 | 98.91 | 96.59 | 99.05 | 96.36 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Rural | | | | | | | |
| Yes | 2.16 | 1.52 | 3.57 | 1.99 | 3.65 | 1.07 | 2.20 |
| No | 97.84 | 98.48 | 96.43 | 98.01 | 96.35 | 98.93 | 97.80 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.109. Cattle owning farmers who use AI as animal breeding method in Tigray by zone (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)

| Farmers use AI | Use of AI by administrative zone | | | | | | |
|---|---|---|---|---|---|---|---|
| | Southern | South east | Eastern | Central | Western | North west | Overall |
| Infant town | | | | | | | |
| Yes | 6.32 | 11.11 | 11.33 | 4.35 | 4.55 | 1.90 | 7.51 |
| No | 93.68 | 88.89 | 88.67 | 95.65 | 95.45 | 98.10 | 92.49 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Rural | | | | | | | |
| Yes | 3.56 | 2.39 | 4.68 | 3.13 | 3.95 | 1.82 | 3.64 |
| No | 96.44 | 97.61 | 95.32 | 96.88 | 96.05 | 98.18 | 96.36 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Farmers' satisfaction with AI | | | | | | | |
| Infant town | | | | | | | |
| Effective | 83.33 | 100.00 | 76.47 | 50.00 | 37.50 | 25.00 | 65.91 |
| Not effective | 16.67 | 0.00 | 23.53 | 50.00 | 62.50 | 75.00 | 34.09 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Rural | | | | | | | |
| Effective | 71.43 | 81.82 | 73.81 | 75.00 | 23.08 | 58.82 | 68.39 |
| Not effective | 28.57 | 18.18 | 26.19 | 25.00 | 76.92 | 41.18 | 31.61 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.110. Farmers who keep milking animals in Tigray by zone (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)

| Dairying | Southern | | | South east | | | Eastern | | | Central | | | North west | | | Western | | | Overall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M | F | O | M | F | O | M | F | O | M | F | O | M | F | O | M | F | O | M | F | O |
| Infant town | | | | | | | | | | | | | | | | | | | | | |
| Yes | 40.58 | 46.15 | 42.11 | 38.89 | 33.33 | 37.78 | 4.59 | 2.44 | 4.00 | 13.43 | 0.00 | 9.78 | 22.45 | 17.24 | 21.59 | 35.00 | 19.35 | 32.70 | 25.00 | 16.77 | 23.28 |
| No | 59.42 | 53.85 | 57.89 | 61.11 | 66.67 | 62.22 | 95.41 | 97.56 | 96.00 | 86.57 | 100 | 90.22 | 77.55 | 82.76 | 78.41 | 65.00 | 80.65 | 67.30 | 75.00 | 83.23 | 76.72 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Rural | | | | | | | | | | | | | | | | | | | | | |
| Yes | 46.79 | 29.32 | 43.84 | 25.41 | 13.64 | 23.14 | 10.19 | 6.67 | 9.36 | 11.98 | 6.93 | 11.15 | 11.23 | 9.09 | 10.94 | 31.12 | 22.42 | 29.58 | 22.38 | 14.01 | 20.88 |
| No | 53.21 | 70.68 | 56.16 | 74.59 | 86.36 | 76.86 | 89.81 | 93.33 | 90.64 | 88.02 | 93.07 | 88.85 | 88.77 | 90.91 | 89.06 | 68.88 | 77.58 | 70.42 | 77.62 | 85.99 | 79.12 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

N = Total number of respondents; HOUSEHOLDs = Households; M= Male; F= Female; O= Overall

Appendix Table 3.3.111. Average, maximum and minimum daily cattle milk production in Tigray by zone (N = 1184 HOUSEHOLDs)

| Cattle breed | Southern | | | South east | | | Eastern | | | Central | | | North west | | | Western | | | Overall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx |
| Infant town | | | | | | | | | | | | | | | | | | | | | |
| Local | - | - | - | 1.12 | 0.30 | 2.00 | 2.00 | 1.00 | 3.00 | 0.83 | 0.50 | 1.00 | 1.55 | 1.00 | 2.00 | 1.16 | 0.50 | 6.00 | 1.26 | 0.30 | 6.00 |
| Begait | 6.64 | 2.00 | 12.00 | 6.29 | 1.50 | 14.00 | 3.75 | 2.50 | 5.00 | 4.33 | 1.00 | 10.00 | 1.66 | 1.00 | 3.00 | 1.31 | 1.00 | 2.00 | 7.21 | 1.00 | 14.00 |
| Exotic | - | - | - | - | - | - | - | - | - | 11.31 | 14 | 30 | - | - | - | 13.33 | 4.00 | 36.00 | 12.68 | 4.00 | 36.00 |
| Crossbred | 8.64 | 4.00 | 18.00 | 9.27 | 4.50 | 21.00 | - | - | - | - | - | - | - | - | - | - | - | - | 8.86 | 4.00 | 21.00 |
| Rural | | | | | | | | | | | | | | | | | | | | | |
| Local | 0.62 | 0.50 | 1.00 | 1.09 | 0.50 | 4.00 | 1.11 | 0.50 | 8.00 | 1.12 | 0.50 | 12.00 | 2.06 | 0.50 | 8.00 | 1.07 | 0.50 | 4.00 | 1.115 | 0.50 | 8.00 |
| Begait | 6.12 | 2.00 | 8.00 | 2.60 | 1.00 | 6.00 | - | - | - | 2.20 | 1.00 | 6.00 | 1.25 | 1.00 | 2.00 | 1.73 | 1.00 | 12.00 | 6.12 | 1.25 | 12.00 |
| Exotic | 4.75 | 4.00 | 7.25 | 14.00 | 4.00 | 24.00 | - | - | - | - | - | - | - | - | - | - | - | - | 10.08 | 4.00 | 24.00 |
| Crossbred | 8.06 | 3.50 | 12.00 | 8.34 | 4.00 | 15.00 | - | - | - | - | - | - | - | - | - | - | - | - | 8.14 | 3.50 | 15.00 |

N = Total number of respondents; HOUSEHOLDs = Households; Av = Average; Mn = Minimum; Mx = Maximum

Appendix Table 3.3.112. Households who raise chicken in Tigray by zone (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)

| Farmers raise chicken | Southern | | | South east | | | Eastern | | | Central | | | North west | | | Western | | | Overall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M | F | O | M | F | O | M | F | O | M | F | O | M | F | O | M | F | O | M | F | O |
| Infant town | | | | | | | | | | | | | | | | | | | | | |
| Yes | 23.19 | 38.46 | 27.37 | 41.67 | 55.56 | 44.44 | 37.61 | 43.90 | 39.33 | 32.84 | 32.00 | 32.61 | 47.62 | 58.62 | 49.43 | 54.44 | 54.84 | 54.50 | 43.09 | 46.58 | 43.82 |
| No | 76.81 | 61.54 | 72.63 | 58.33 | 44.44 | 55.56 | 62.39 | 56.10 | 60.67 | 67.16 | 68.00 | 67.39 | 52.38 | 41.38 | 50.57 | 45.56 | 45.16 | 45.50 | 56.91 | 53.42 | 56.18 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Rural | | | | | | | | | | | | | | | | | | | | | |
| Yes | 28.90 | 40.60 | 30.88 | 45.41 | 53.41 | 46.94 | 46.00 | 47.14 | 46.27 | 42.23 | 38.10 | 41.55 | 46.32 | 40.91 | 45.59 | 56.25 | 53.33 | 55.73 | 44.00 | 45.24 | 44.23 |
| No | 71.10 | 59.40 | 69.12 | 54.59 | 46.59 | 53.06 | 54.00 | 52.86 | 53.73 | 57.77 | 61.90 | 58.45 | 53.68 | 59.09 | 54.41 | 43.75 | 46.67 | 44.27 | 56.00 | 54.76 | 55.77 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

N = Total number of respondents; HOUSEHOLDs = Households; M = Male; F = Female; O = Overall

Appendix Table 3.3.113. Distribution of chicken breeds among poultry producers in Tigray by zone (N= 2466 HOUSEHOLDs) (% of HOUSEHOLDs)

| Chicken breeds | Administrative zone | | | | | | |
|---|---|---|---|---|---|---|---|
| | Southern | South east | Eastern | Central | Western | North west | Overall |
| Infant town | | | | | | | |
| Local chicken | 45.83 | 55.00 | 44.23 | 58.06 | 91.57 | 82.41 | 67.66 |
| Exotic/hybrid chicken | 54.17 | 45.00 | 55.77 | 41.94 | 8.43 | 17.59 | 28.19 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Rural | | | | | | | |
| Local chicken | 64.00 | 70.50 | 56.62 | 70.59 | 90.34 | 84.01 | 68.48 |
| Exotic/hybrid chicken | 36.00 | 29.50 | 43.38 | 29.41 | 9.66 | 15.99 | 27.81 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.114. Average number of laying hens per household in Tigray region by zone (N = 2466 HOUSEHOLDs)

| Hen breed | Administrative zone | | | | | | |
|---|---|---|---|---|---|---|---|
| | Southern | South east | Eastern | Central | Western | North west | Overall |
| Infant town | | | | | | | |
| Local hen | 4.36 | 4.00 | 4.00 | 4.55 | 3.38 | 2.94 | 3.44 |
| Exotic/hybrid hen | 6.38 | 3.66 | 4.68 | 5.41 | 2.25 | 2.25 | 4.50 |
| Total (N) | - | - | - | - | - | - | - |
| Rural | | | | | | | |
| Local hen | 6.08 | 6.73 | 4.06 | 5.37 | 4.83 | 3.08 | 4.62 |
| Exotic/hybrid hen | 13.88 | 3.51 | 6.47 | 10.20 | 3.92 | 4.04 | 7.82 |
| Total (N) | - | - | - | - | - | - | - |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.115. The average, minimum and maximum clutch length in days of local hens (days/head) in Tigray region by zone (N = 2466 HOUSEHOLDs)

| Hen breed | Southern | | | South east | | | Eastern | | | Central | | | North west | | | Western | | | Overall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx |
| Infant town | | | | | | | | | | | | | | | | | | | | | |
| Local | 27.14 | 25 | 29 | 24.00 | 20 | 30 | 15.77 | 10 | 24 | 12.81 | 10 | 15 | 16.70 | 10 | 30 | 16.59 | 10 | 30 | 17.00 | 10 | 30 |
| Exotic/hybrid | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Rural | | | | | | | | | | | | | | | | | | | | | |
| Local | 20.06 | 10 | 32 | 19.83 | 10 | 30 | 16.84 | 10 | 30 | 17.08 | 10 | 30 | 16.92 | 10 | 30 | 16.49 | 10 | 30 | 7.36 | 10 | 32 |
| Exotic/hybrid | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

N = Total number of respondents; HOUSEHOLDs = Households; Av = Average; Mn = Minimum; Mx = Maximum

Appendix Table 3.3.116. The average, minimum and maximum egg production per clutch of local hens (egg/hen/clutch) in Tigray region by zone (N = 2466 HOUSEHOLDs)

| Hen breed | Southern | | | South east | | | Eastern | | | Central | | | North west | | | Western | | | Overall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx |
| Infant town | | | | | | | | | | | | | | | | | | | | | |
| Local | 15.42 | 10 | 25 | 14.75 | 10 | 20 | 17.16 | 10 | 30 | 13.66 | 10 | 15 | 12.72 | 8 | 20 | 13.42 | 8 | 25 | 13.50 | 8 | 30 |
| Exotic/hybrid | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Rural | | | | | | | | | | | | | | | | | | | | | |
| Local | 17.39 | 10 | 30 | 17.50 | 10 | 30 | 15.55 | 8 | 30 | 15.84 | 8 | 30 | 13.90 | 8 | 28 | 13.38 | 8 | 30 | 14.99 | 6 | 30 |
| Exotic/hybrid | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

N = Total number of respondents; HOUSEHOLDs = Households; Av = Average; Mn = Minimum; Mx = Maximum

Appendix Table 3.3.117. The average, minimum and maximum annual egg production in year of local and exotic/hybrid hens (eggs/hen/year) in Tigray region by zone (N = 2466 HOUSEHOLDs)

| Hen breed | Southern | | | South east | | | Eastern | | | Central | | | North west | | | Western | | | Overall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx |
| Infant town | | | | | | | | | | | | | | | | | | | | | |
| Local | 61 | 40 | 100 | 59 | 40 | 80 | 68 | 40 | 120 | 54.64 | 40 | 60 | 50 | 32 | 80 | 53 | 32 | 100 | 57.32 | 35.00 | 74.00 |
| Exotic/hybrid | 277 | 180 | 365 | 280 | 280 | 280 | 275 | 90 | 365 | 241 | 182 | 300 | 276 | 276 | 276 | 282 | 200 | 365 | 252.14 | 95.00 | 350.00 |
| Rural | | | | | | | | | | | | | | | | | | | | | |
| Local | 69 | 40 | 120 | 70 | 40 | 120 | 62 | 32 | 120 | 63 | 32 | 120 | 55 | 32 | 112 | 53 | 32 | 120 | 56.12 | 31.00 | 76.00 |
| Exotic/hybrid | 227 | 90 | 365 | 253 | 90 | 365 | 251 | 90 | 365 | 254 | 90 | 365 | 253 | 150 | 365 | 224 | 99 | 350 | 248.24 | 90.00 | 360.00 |

N = Total number of respondents; HOUSEHOLDs = Households; Av = Average; Mn = Minimum; Mx = Maximum

Appendix Table 3.3.118. Households who practice beekeeping in Tigray by zone (N = 5582 HOUSEHOLDs) (% of HOUSEHOLDs)

| Farmers practice beekeeping | Southern | | | South east | | | Eastern | | | Central | | | North west | | | Western | | | Overall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M | F | O | M | F | O | M | F | O | M | F | O | M | F | O | M | F | O | M | F | O |
| Infant town | | | | | | | | | | | | | | | | | | | | | |
| Yes | 4.35 | 0.00 | 3.16 | 8.33 | 0.00 | 6.67 | 2.75 | 0.00 | 2.00 | 14.93 | 4.00 | 11.96 | 3.40 | 0.00 | 2.84 | 3.89 | 3.23 | 3.79 | 5.10 | 1.24 | 4.29 |
| No | 95.65 | 100 | 96.84 | 91.67 | 100 | 93.33 | 97.25 | 100 | 98.00 | 85.07 | 96.00 | 88.04 | 96.60 | 100 | 97.16 | 96.11 | 96.77 | 96.21 | 94.90 | 98.76 | 95.71 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Rural | | | | | | | | | | | | | | | | | | | | | |
| Yes | 4.74 | 2.26 | 4.32 | 6.76 | 3.41 | 6.11 | 9.75 | 3.33 | 8.25 | 10.20 | 3.46 | 9.09 | 6.32 | 2.27 | 5.78 | 5.47 | 3.03 | 5.04 | 7.69 | 3.10 | 6.86 |
| No | 95.26 | 97.74 | 95.68 | 93.24 | 96.59 | 93.89 | 90.25 | 96.67 | 91.75 | 89.80 | 96.54 | 90.91 | 93.68 | 97.73 | 94.22 | 94.53 | 96.97 | 94.96 | 92.31 | 96.90 | 93.14 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.119. Beehive holding type amongst beekeepers in Tigray by zone (N= 363 HOUSEHOLDs) (% of HOUSEHOLDs)

| Beehive type | Administrative zone | | | | | | |
|---|---|---|---|---|---|---|---|
| | Southern | South east | Eastern | Central | Western | North west | Overall |
| Infant town | | | | | | | |
| Traditional hive | 66.67 | 66.67 | 0.00 | 90.91 | 80.00 | 100.00 | 78.79 |
| Modern hive | 33.33 | 33.33 | 100.00 | 9.09 | 20.00 | 0.00 | 21.21 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Rural | | | | | | | |
| Traditional hive | 66.67 | 85.71 | 74.67 | 71.09 | 84.21 | 95.65 | 76.36 |
| Modern hive | 33.33 | 14.29 | 25.33 | 28.91 | 15.79 | 4.35 | 23.03 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.120. Average number of owned bee hives per household in Tigray region by zone (N = 363 HOUSEHOLDs)

| Beehive type | Administrative zone | | | | | | |
|---|---|---|---|---|---|---|---|
| | Southern | South east | Eastern | Central | Western | North west | Overall |
| Infant town | | | | | | | |
| Traditional hive | - | 1.00 | - | 1.60 | 6.50 | 2.25 | 3.11 |
| Modern hive | 2.00 | - | 2.66 | 2.50 | - | - | 2.56 |
| Total (N) | - | - | - | - | - | - | - |
| Rural | | | | | | | |
| Traditional hive | 2.22 | 1.87 | 2.10 | 2.29 | 2.93 | 2.61 | 2.30 |
| Modern hive | 3.27 | - | 2.00 | 2.66 | 4.33 | 3.00 | 5.07 |
| Total (N) | - | - | - | - | - | - | - |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.121. Average, minimum and maximum honey yield of traditional and local hives (kg/hive/year) in Tigray region by zone (N = 363 HOUSEHOLDs)

| Hive type | Southern | | | South east | | | Eastern | | | Central | | | Western | | | North west | | | Overall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx |
| Infant town | | | | | | | | | | | | | | | | | | | | | |
| Traditional | - | - | - | - | - | - | - | - | - | 5.00 | 3 | 10 | | | | 9.25 | 4 | 15 | 6.44 | 3.00 | 15.00 |
| Modern | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 13.46 | 7.00 | 30.00 |
| Rural | | | | | | | | | | | | | | | | | | | | | |
| Traditional | 5.73 | 3 | 12 | 7.71 | 3 | 12 | 9.07 | 3 | 20 | 6.93 | 3 | 20 | 6.67 | 3 | 12 | 10.00 | 4 | 21 | 6.89 | 3.00 | 21.00 |
| Modern | 6.62 | 5 | 10 | 17.33 | 10 | 30 | 10.25 | 5 | 20 | 12.08 | 5 | 28 | 13.00 | 10 | 16 | 16.00 | 14 | 18 | 11.39 | 5.00 | 30.00 |

N = Total number of respondents; HOUSEHOLDs = Households; Av = Average; Mn = Minimum; Mx = Maximum

Appendix Table 3.3.122. Average, minimum and maximum frequency of honey harvesting per annum in Tigray region by zone (N = 363 HOUSEHOLDs)

| Hive type | Southern | | | South east | | | Eastern | | | Central | | | Western | | | North west | | | Overall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx | Av | Mn | Mx |
| Infant town | | | | | | | | | | | | | | | | | | | | | |
| Traditional | 2.50 | 1 | 4 | - | - | - | - | - | - | 1.10 | 1 | 2 | 2.50 | 1 | 4 | 1.37 | 1 | 2 | 1.50 | 1 | 4 |
| Modern | - | - | - | - | - | - | 2.00 | 1 | 4 | - | - | - | - | - | - | - | - | - | 2.28 | 1 | 4 |
| Rural | | | | | | | | | | | | | | | | | | | | | |
| Traditional | 1.45 | 1 | 4 | 1.29 | 1 | 4 | 1.54 | 1 | 4 | 1.35 | 1 | 4 | 1.75 | 1 | 3 | 1.40 | 1 | 3 | 1.43 | 1 | 4 |
| Modern | 1.63 | 1 | 4 | 1.75 | 1 | 2 | 1.68 | 1 | 4 | 1.35 | 1 | 4 | 1.33 | 1 | 2 | 1.50 | 1 | 2 | 1.50 | 1 | 4 |

N = Total number of respondents; HOUSEHOLDs = Households; Av = Average; Mn = Minimum; Mx = Maximum

Appendix Table 3.3.123. Frequency of honey harvesting per annum in Tigray region by zone (N = 363 HOUSEHOLDs) (% of HOUSEHOLDs)

| Frequency of honey harvesting | Administrative zone | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Southern | | South east | | Eastern | | Central | | Western | | North west | | Overall | |
| | TH | MH | TH | MH | TH | MH | TH | MH | TH | MH | TH | MH | TH | MH |
| Infant town | | | | | | | | | | | | | | |
| Once a year | 50.00 | 100.00 | 100.00 | 100.00 | 0.00 | 66.67 | 90.00 | 0.00 | 25.00 | 0.00 | 62.50 | 0.00 | 69.23 | 57.14 |
| Twice a year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.00 | 0.00 | 25.00 | 0.00 | 37.50 | 0.00 | 19.23 | 0.00 |
| Three times a year | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.00 | 0.00 | 0.00 | 0.00 | 3.85 | 0.00 |
| Four times a year | 50.00 | 0.00 | 0.00 | 0.00 | 0.00 | 33.33 | 0.00 | 100.00 | 25.00 | 100.00 | 0.00 | 0.00 | 7.69 | 42.86 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 0.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 0.00 | 100.00 | 100.00 |
| Rural | | | | | | | | | | | | | | |
| Once a year | 63.64 | 54.55 | 79.17 | 25.00 | 69.09 | 57.89 | 78.02 | 75.68 | 37.50 | 66.67 | 63.64 | 50.00 | 69.84 | 64.47 |
| Twice a year | 31.82 | 36.36 | 16.67 | 75.00 | 18.18 | 26.32 | 15.38 | 18.92 | 50.00 | 33.33 | 31.82 | 50.00 | 22.62 | 27.63 |
| Three times a year | 0.00 | 0.00 | 0.00 | 0.00 | 1.82 | 5.26 | 0.00 | 0.00 | 12.50 | 0.00 | 4.55 | 0.00 | 1.98 | 1.32 |
| Four times a year | 4.55 | 9.09 | 4.17 | 0.00 | 10.91 | 10.53 | 6.59 | 5.41 | 0.00 | 0.00 | 0.00 | 0.00 | 5.56 | 6.58 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households; TH = Traditional hive; MD = Modern hive

Appendix Table 3.3.124. Farmers who harvested wax in the past 12 months (March 2017 – April 2018) in Tigray by zone (N = 363 HOUSEHOLDs) (% of HOUSEHOLDs)

| Farmers harvest wax | Administrative zone | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Southern | | South east | | Eastern | | Central | | Western | | North west | | Overall | |
| | TH | MH | TH | MH | TH | MH | TH | MH | TH | MH | TH | MH | TH | MH |
| Infant town | | | | | | | | | | | | | | |
| Yes | 0.00 | 0.00 | 0.00 | 100.00 | 0.00 | 66.67 | 40.00 | 0.00 | 25.00 | 0.00 | 0.00 | 0.00 | 19.23 | 42.86 |
| No | 100.00 | 100.00 | 100.00 | 0.00 | 0.00 | 33.33 | 60.00 | 100.00 | 75.00 | 100.00 | 100.00 | 0.00 | 80.77 | 57.14 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 0.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 0.00 | 100.00 | 100.00 |
| Rural | | | | | | | | | | | | | | |
| Yes | 18.18 | 36.36 | 16.67 | 25.00 | 30.91 | 21.05 | 23.08 | 18.92 | 25.00 | 33.33 | 18.18 | 50.00 | 23.02 | 23.68 |
| No | 81.82 | 63.64 | 83.33 | 75.00 | 69.09 | 78.95 | 76.92 | 81.08 | 75.00 | 66.67 | 81.82 | 50.00 | 76.98 | 76.32 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households; TH = Traditional hive; MD = Modern hive

Appendix Table 3.3.125. Farmers who reared new bee colony in the past 12 months (March 2017 – April 2018) in Tigray by zone (N = 363 HOUSEHOLDs) (% of HOUSEHOLDs)

| Farmers rear new bee colony | Administrative zone | | | | | | |
|---|---|---|---|---|---|---|---|
| | Southern | South east | Eastern | Central | Western | North west | Overall |
| Infant town | | | | | | | |
| Yes | 66.67 | 0.00 | 0.00 | 18.18 | 0.00 | 0.00 | 12.12 |
| No | 33.33 | 100.00 | 100.00 | 81.82 | 100.00 | 100.00 | 87.88 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Rural | | | | | | | |
| Yes | 26.47 | 10.71 | 21.62 | 11.72 | 5.26 | 8.51 | 14.55 |
| No | 73.53 | 89.29 | 78.38 | 88.28 | 94.74 | 91.49 | 85.45 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.126. Utilization of milk in Tigray by zone (N = 1184 HOUSEHOLDs) (% of HOUSEHOLDs)

| Milk use for | Milk utilization practice by administrative zone | | | | | | |
|---|---|---|---|---|---|---|---|
| | Southern | South east | Eastern | Central | Western | North west | Overall |
| Infant town | | | | | | | |
| Home consumption | 46.15 | 47.06 | 35.29 | 40.91 | 53.13 | 59.81 | 88.83 |
| Sale (market) | 12.31 | 17.65 | 23.53 | 13.64 | 18.75 | 4.67 | 19.55 |
| Processing (milk products) | 30.77 | 23.53 | 17.65 | 27.27 | 18.75 | 29.91 | 46.93 |
| Other uses | 4.62 | 0.00 | 0.00 | 0.00 | 3.13 | 1.87 | 3.91 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Rural | | | | | | | |
| Home consumption | 57.43 | 56.58 | 65.63 | 68.58 | 69.39 | 64.20 | 89.65 |
| Sale (market) | 4.48 | 1.97 | 7.81 | 3.98 | 0.00 | 2.47 | 5.37 |
| Processing (milk products) | 30.35 | 36.18 | 26.56 | 26.99 | 30.61 | 31.85 | 44.08 |
| Other uses | 7.74 | 5.26 | 0.00 | 0.44 | 0.00 | 1.48 | 5.27 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.127. Milk sale practice of sampled households in Tigray by zone (N = 1184 HOUSEHOLDs) (% of HOUSEHOLDs)

| Farmers sell milk | Milk sale practice by administrative zone | | | | | | |
|---|---|---|---|---|---|---|---|
| | Southern | South east | Eastern | Central | Western | North west | Overall |
| Infant town | | | | | | | |
| Yes | 20.00 | 29.41 | 66.67 | 33.33 | 26.32 | 5.80 | 18.99 |
| No | 80.00 | 70.59 | 33.33 | 66.67 | 73.68 | 94.20 | 81.01 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Rural | | | | | | | |
| Yes | 3.19 | 4.67 | 11.90 | 3.82 | 0.00 | 3.26 | 4.08 |
| No | 96.81 | 95.33 | 88.10 | 96.18 | 100.00 | 96.74 | 95.92 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.128. Milk products sale practice of sampled households in Tigray by zone (N = 1184 HOUSEHOLDs) (% of HOUSEHOLDs)

| Farmers sell milk products | Milk products sale practice by administrative zone | | | | | | |
|---|---|---|---|---|---|---|---|
| | Southern | South east | Eastern | Central | Western | North west | Overall |
| Infant town | | | | | | | |
| Yes | 40.00 | 17.65 | 50.00 | 33.33 | 18.42 | 13.04 | 22.91 |
| No | 60.00 | 82.35 | 50.00 | 66.67 | 81.58 | 86.96 | 77.09 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Rural | | | | | | | |
| Yes | 20.87 | 17.76 | 17.86 | 12.10 | 5.56 | 6.88 | 14.53 |
| No | 79.13 | 82.24 | 82.14 | 87.90 | 94.44 | 93.12 | 85.47 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.129. Utilization of eggs in Tigray by zone (N = 2466 HOUSEHOLDs) (% of HOUSEHOLDs)

| Egg use for | Egg utilization practice by administrative zone | | | | | | |
|---|---|---|---|---|---|---|---|
| | Southern | South east | Eastern | Central | Western | North west | Overall |
| Infant town | | | | | | | |
| Home consumption | 44.30 | 50.00 | 36.23 | 52.78 | 84.54 | 73.88 | 48.81 |
| Sale (market) | 36.71 | 31.67 | 23.19 | 13.89 | 5.15 | 11.19 | 39.88 |
| Processing (egg products) | 17.72 | 15.00 | 40.58 | 33.33 | 9.28 | 14.93 | 0.00 |
| Other uses | 1.27 | 3.33 | 0.00 | 0.00 | 1.03 | 0.00 | 1.49 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Rural | | | | | | | |
| Home consumption | 52.88 | 50.72 | 48.48 | 59.17 | 82.87 | 77.13 | 40.96 |
| Sale (market) | 31.27 | 36.00 | 15.80 | 15.44 | 9.39 | 9.99 | 58.62 |
| Processing (egg products) | 12.54 | 10.88 | 35.71 | 25.38 | 7.18 | 12.16 | 0.19 |
| Other uses | 3.31 | 2.40 | 0.00 | 0.00 | 0.55 | 0.72 | 3.15 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.130. Egg sale practice of sampled households in Tigray by zone (N = 2466 HOUSEHOLDs) (% of HOUSEHOLDs)

| Farmers sell eggs | Egg sale practice by administrative zone | | | | | | |
|---|---|---|---|---|---|---|---|
| | Southern | South east | Eastern | Central | Western | North west | Overall |
| Infant town | | | | | | | |
| Yes | 73.08 | 60.00 | 59.32 | 53.33 | 17.24 | 32.17 | 39.76 |
| No | 26.92 | 40.00 | 40.68 | 46.67 | 82.76 | 67.83 | 60.24 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Rural | | | | | | | |
| Yes | 68.72 | 82.41 | 68.67 | 60.68 | 23.33 | 34.42 | 56.32 |
| No | 31.28 | 17.59 | 31.33 | 39.32 | 76.67 | 65.58 | 43.68 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.131. Utilization of honey in Tigray by zone (N = 363 HOUSEHOLDs) (% of HOUSEHOLDs)

| Honey use for | Honey utilization practice by administrative zone | | | | | | |
|---|---|---|---|---|---|---|---|
| | Southern | South east | Eastern | Central | Western | North west | Overall |
| Infant town | | | | | | | |
| Home consumption | 66.67 | 66.67 | 50.00 | 76.92 | 33.33 | 53.33 | 81.82 |
| Sale (market) | 33.33 | 0.00 | 33.33 | 15.38 | 33.33 | 46.67 | 45.45 |
| Processing (egg products) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Other uses | 0.00 | 33.33 | 16.67 | 7.69 | 33.33 | 0.00 | 12.12 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Rural | | | | | | | |
| Home consumption | 55.32 | 51.28 | 49.02 | 54.05 | 55.56 | 55.88 | 75.45 |
| Sale (market) | 34.04 | 43.59 | 35.29 | 40.00 | 40.74 | 41.18 | 55.15 |
| Processing (egg products) | 0.00 | 0.00 | 0.98 | 0.00 | 0.00 | 1.47 | 0.61 |
| Other uses | 10.64 | 5.13 | 14.71 | 5.95 | 3.70 | 1.47 | 10.61 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.132. Utilization of wax in Tigray by zone (N = 363 HOUSEHOLDs) (% of HOUSEHOLDs)

| Wax use for | Wax utilization practice by administrative zone | | | | | | |
|---|---|---|---|---|---|---|---|
| | Southern | South east | Eastern | Central | Western | North west | Overall |
| Infant town | | | | | | | |
| Home consumption | 66.67 | 33.33 | 66.67 | 36.84 | 40.00 | 44.44 | 54.55 |
| Sale (market) | 0.00 | 0.00 | 33.33 | 26.32 | 0.00 | 11.11 | 6.06 |
| Processing (candle etc) | 0.00 | 0.00 | 0.00 | 15.79 | 0.00 | 0.00 | 3.03 |
| Other uses | 33.33 | 66.67 | 0.00 | 21.05 | 60.00 | 44.44 | 39.39 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Rural | | | | | | | |
| Home consumption | 28.57 | 41.38 | 45.78 | 42.97 | 42.86 | 41.67 | 43.64 |
| Sale (market) | 8.57 | 6.90 | 14.46 | 3.91 | 4.76 | 4.17 | 8.79 |
| Processing (candle etc) | 2.86 | 0.00 | 2.41 | 1.56 | 4.76 | 0.00 | 3.64 |
| Other uses | 60.00 | 51.72 | 37.35 | 51.56 | 47.62 | 54.17 | 51.52 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.133. Honey sale practice of sampled households in Tigray by zone (N = 363 HOUSEHOLDs) (% of HOUSEHOLDs)

| Farmers sell honey | Honey sale practice by administrative zone | | | | | | |
|---|---|---|---|---|---|---|---|
| | Southern | South east | Eastern | Central | Western | North west | Overall |
| Infant town | | | | | | | |
| Yes | 66.67 | 33.33 | 66.67 | 18.18 | 40.00 | 87.50 | 48.48 |
| No | 33.33 | 66.67 | 33.33 | 81.82 | 60.00 | 12.50 | 51.52 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Rural | | | | | | | |
| Yes | 44.12 | 60.71 | 41.89 | 54.69 | 57.89 | 57.45 | 51.82 |
| No | 55.88 | 39.29 | 58.11 | 45.31 | 42.11 | 42.55 | 48.18 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.134. Wax sale practice of sampled households in Tigray by zone (N = 363 HOUSEHOLDs) (% of HOUSEHOLDs)

| Farmers sell wax | Wax sale practice by administrative zone | | | | | | |
|---|---|---|---|---|---|---|---|
| | Southern | South east | Eastern | Central | Western | North west | Overall |
| Infant town | | | | | | | |
| Yes | 0.00 | 0.00 | 33.33 | 9.09 | 0.00 | 0.00 | 6.06 |
| No | 100.00 | 100.00 | 66.67 | 90.91 | 100.00 | 100.00 | 93.94 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Rural | | | | | | | |
| Yes | 0.00 | 3.57 | 6.76 | 5.47 | 5.26 | 2.13 | 4.55 |
| No | 100.00 | 96.43 | 93.24 | 94.53 | 94.74 | 97.87 | 95.45 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.135. New bee colony sale practice of sampled households in Tigray by zone (N = 363 HOUSEHOLDs) (% of HOUSEHOLDs)

| Farmers sell new bee colony | New bee colony sale practice by administrative zone | | | | | | |
|---|---|---|---|---|---|---|---|
| | Southern | South east | Eastern | Central | Western | North west | Overall |
| Infant town | | | | | | | |
| Yes | 33.33 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.03 |
| No | 66.67 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 96.97 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Rural | | | | | | | |
| Yes | 5.88 | 0.00 | 8.11 | 4.69 | 0.00 | 2.13 | 4.55 |
| No | 94.12 | 100.00 | 91.89 | 95.31 | 100.00 | 97.87 | 95.45 |
| Total (N) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

N = Total number of respondents; HOUSEHOLDs = Households

Appendix Table 3.3.136. Conversion factor for Tropical Livestock Unit (TLU).

| Animal type | Conversion factor |
|---|---|
| Cattle | 1.00 |
| Oxen | 1.1 |
| Bulls | 0.8 |
| Cows | 1.0 |
| Heifer | 0.5 |
| Calves | 0.2 |
| Sheep | 0.1 |
| Goats | 0.1 |
| Donkeys | 0.5 |
| Horses | 0.8 |
| Mules | 0.7 |
| Camels | 1.1 |
| Chickens | 0.01 |
| Pig | 0.3 |
| Bee hives | - |

**Appendix Table3.4. 1**Household members Income diversification by place of residence

| | | Central zone | | | Urban | | | Rural | |
|---|---|---|---|---|---|---|---|---|---|
| Income-diversification | Freq. | Percent | Cum. | Freq. | Percent | Cum. | | | |
| 0 | 125 | 4.32 | 4.32 | 67 | 6.27 | 6.27 | 58 | 3.18 | 3.18 |
| 1 | 2,000 | 69.08 | 73.40 | 666 | 62.30 | 68.57 | 1,334 | 73.06 | 76.23 |
| 2 | 627 | 21.66 | 95.06 | 271 | 25.35 | 93.92 | 356 | 19.50 | 95.73 |
| 3 | 108 | 3.73 | 98.79 | 50 | 4.68 | 98.60 | 58 | 3.18 | 98.90 |
| 4 | 28 | 0.97 | 99.76 | 10 | 0.94 | 99.53 | 18 | 0.99 | 99.89 |
| 5 | 5 | 0.17 | 99.93 | 4 | 0.37 | 99.91 | 1 | 0.05 | 99.95 |
| 6 | 1 | 0.03 | 99.97 | 1 | 0.09 | 100.00 | | | |
| 7 | 1 | 0.03 | 100.00 | | | | 1 | 0.05 | 100.00 |
| Total | 2,895 | 100.00 | | 1,069 | 100.00 | | 1,826 | 100.00 | |

**Appendix Table 3.4. 2** Household Income diversification by place of residence

| | | Central zone | | | Male | | | Female | |
|---|---|---|---|---|---|---|---|---|---|
| Income-diversification | Freq. | Percent | Cum. | Freq. | Percent | Cum. | Freq. | Percent | Cum. |
| 0 | 125 | 4.32 | 4.32 | 26 | 1.27 | 1.27 | 99 | 11.70 | 11.70 |
| 1 | 2,000 | 69.08 | 73.40 | 1,396 | 68.13 | 69.40 | 604 | 71.39 | 83.10 |
| 2 | 627 | 21.66 | 95.06 | 509 | 24.84 | 94.24 | 118 | 13.95 | 97.04 |
| 3 | 108 | 3.73 | 98.79 | 88 | 4.29 | 98.54 | 20 | 2.36 | 99.41 |
| 4 | 28 | 0.97 | 99.76 | 23 | 1.12 | 99.66 | 5 | 0.59 | 100.00 |
| 5 | 5 | 0.17 | 99.93 | 5 | 0.24 | 99.90 | - | - | - |
| 6 | 1 | 0.03 | 99.97 | 1 | 0.05 | 99.95 | - | - | - |
| 7 | 1 | 0.03 | 100.00 | 1 | 0.05 | 100.00 | - | - | - |
| Total | 2,895 | 100.00 | | 2,049 | 100.00 | | 846 | 100.00 | |

**Appendix Table3.4. 3**Household Income diversification by place of residence

| | Eastern zone | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| Income-diversification | Freq. | Percent | Cum. | Freq. | Percent | Cum. | Freq. | Percent | Cum. |
| 0 | 149 | 6.96 | 6.96 | 84 | 9.08 | 9.08 | 65 | 5.35 | 5.35 |
| 1 | 1,460 | 68.22 | 75.19 | 591 | 63.89 | 72.97 | 869 | 71.52 | 76.87 |
| 2 | 396 | 18.50 | 93.69 | 182 | 19.68 | 92.65 | 214 | 17.61 | 94.49 |
| 3 | 101 | 4.72 | 98.41 | 52 | 5.62 | 98.27 | 49 | 4.03 | 98.52 |
| 4 | 29 | 1.36 | 99.77 | 12 | 1.30 | 99.57 | 17 | 1.40 | 99.92 |
| 5 | 3 | 0.14 | 99.91 | 3 | 0.32 | 99.89 | | | |
| 6 | 2 | 0.09 | 100.00 | 1 | 0.11 | 100.00 | 1 | 0.08 | 100.00 |
| Total | 2,140 | 100.00 | | 925 | 100.00 | | 1,215 | 100.00 | |

**Appendix Table 3.4. 4**Household Income diversification by place of residence

| | Eastern zone | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| Income-diversification | Freq. | Percent | Cum. | Freq. | Percent | Cum. | Freq. | Percent | Cum. |
| 0 | 149 | 6.96 | 6.96 | 20 | 1.52 | 1.52 | 129 | 15.62 | 15.62 |
| 1 | 1,460 | 68.22 | 75.19 | 897 | 68.26 | 69.79 | 563 | 68.16 | 83.78 |
| 2 | 396 | 18.50 | 93.69 | 292 | 22.22 | 92.01 | 104 | 12.59 | 96.37 |
| 3 | 101 | 4.72 | 98.41 | 79 | 6.01 | 98.02 | 22 | 2.66 | 99.03 |
| 4 | 29 | 1.36 | 99.77 | 22 | 1.67 | 99.70 | 7 | 0.85 | 99.88 |
| 5 | 3 | 0.14 | 99.91 | 2 | 0.15 | 99.85 | 1 | 0.12 | 100.00 |
| 6 | 2 | 0.09 | 100.00 | 2 | 0.15 | 100.00 | | | |
| Total | 2,140 | 100.00 | | 1,314 | 100.00 | | 826 | 100.00 | |

**Appendix Table 3.4. 5**Household Income diversification by place of residence

| | North west zone | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| Income-diversification | Freq. | Percent | Cum. | Freq. | Percent | Cum. | Freq. | Percent | Cum. |
| 0 | 71 | 3.62 | 3.62 | 48 | 6.09 | 6.09 | 23 | 1.96 | 1.96 |
| 1 | 1,001 | 51.07 | 54.69 | 423 | 53.68 | 59.77 | 578 | 49.32 | 51.28 |
| 2 | 667 | 34.03 | 88.72 | 231 | 29.31 | 89.09 | 436 | 37.20 | 88.48 |
| 3 | 160 | 8.16 | 96.89 | 62 | 7.87 | 96.95 | 98 | 8.36 | 96.84 |
| 4 | 48 | 2.45 | 99.34 | 19 | 2.41 | 99.37 | 29 | 2.47 | 99.32 |
| 5 | 6 | 0.31 | 99.64 | 3 | 0.38 | 99.75 | 3 | 0.26 | 99.57 |
| 6 | 5 | 0.26 | 99.90 | 2 | 0.25 | 100.00 | 3 | 0.26 | 99.83 |
| 7 | 1 | 0.05 | 99.95 | | | | 1 | 0.09 | 99.91 |
| 8 | 1 | 0.05 | 100.00 | | | | 1 | 0.09 | 100.00 |
| Total | 1,960 | 100.00 | | 788 | 100.00 | | 1,172 | 100.00 | |

**Appendix Table 3.4. 6** Household Income diversification by place of residence

| | North west zone | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| Income-diversification | Freq. | Percent | Cum. | Freq. | Percent | Cum. | Freq. | Percent | Cum. |
| 0 | 71 | 3.62 | 3.62 | 18 | 1.27 | 1.27 | 53 | 9.76 | 9.76 |
| 1 | 1,001 | 51.07 | 54.69 | 651 | 45.94 | 47.21 | 350 | 64.46 | 74.22 |
| 2 | 667 | 34.03 | 88.72 | 572 | 40.37 | 87.58 | 95 | 17.50 | 91.71 |
| 3 | 160 | 8.16 | 96.89 | 130 | 9.17 | 96.75 | 30 | 5.52 | 97.24 |
| 4 | 48 | 2.45 | 99.34 | 36 | 2.54 | 99.29 | 12 | 2.21 | 99.45 |
| 5 | 6 | 0.31 | 99.64 | 3 | 0.21 | 99.51 | 3 | 0.55 | 100.00 |
| 6 | 5 | 0.26 | 99.90 | 5 | 0.35 | 99.86 | | | |
| 7 | 1 | 0.05 | 99.95 | 1 | 0.07 | 99.93 | | | |
| 8 | 1 | 0.05 | 100.00 | 1 | 0.07 | 100.00 | | | |
| Total | 1,960 | 100.00 | | 1,417 | 100.00 | | 543 | 100.00 | |

**Appendix Table 3.4. 7** Household Income diversification by place of residence

| | Southern Zone | | | Urban | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| Income-diversification | Freq. | Percent | Cum. | Freq. | Percent | Cum. | Freq. | Percent | Cum. |
| 0 | 77 | 3.94 | 3.94 | 51 | 5.90 | 5.90 | 26 | 2.39 | 2.39 |
| 1 | 1,284 | 65.71 | 69.65 | 529 | 61.23 | 67.13 | 755 | 69.27 | 71.65 |
| 2 | 458 | 23.44 | 93.09 | 210 | 24.31 | 91.44 | 248 | 22.75 | 94.40 |
| 3 | 109 | 5.58 | 98.67 | 60 | 6.94 | 98.38 | 49 | 4.50 | 98.90 |
| 4 | 22 | 1.13 | 99.80 | 11 | 1.27 | 99.65 | 11 | 1.01 | 99.91 |
| 5 | 3 | 0.15 | 99.95 | 2 | 0.23 | 99.88 | 1 | 0.09 | 100.00 |
| 6 | 1 | 0.05 | 100.00 | 1 | 0.12 | 100.00 | | | |
| Total | 1,954 | 100.00 | | 864 | 100.00 | | 1,090 | 100.00 | |

**Appendix Table 3.4. 8** Household Income diversification by place of residence

| | Southern Zone | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| Income-diversification | Freq. | Percent | Cum. | Freq. | Percent | Cum. | Freq. | Percent | Cum. |
| 0 | 77 | 3.94 | 3.94 | 9 | 0.72 | 0.72 | 68 | 9.59 | 9.59 |
| 1 | 1,284 | 65.71 | 69.65 | 794 | 63.78 | 64.50 | 490 | 69.11 | 78.70 |
| 2 | 458 | 23.44 | 93.09 | 345 | 27.71 | 92.21 | 113 | 15.94 | 94.64 |
| 3 | 109 | 5.58 | 98.67 | 77 | 6.18 | 98.39 | 32 | 4.51 | 99.15 |
| 4 | 22 | 1.13 | 99.80 | 17 | 1.37 | 99.76 | 5 | 0.71 | 99.86 |
| 5 | 3 | 0.15 | 99.95 | 2 | 0.16 | 99.92 | 1 | 0.14 | 100.00 |
| 6 | 1 | 0.05 | 100.00 | 1 | 0.08 | 100.00 | | | |
| Total | 1,954 | 100.00 | | 1,245 | 100.00 | | 709 | 100.00 | |

**Appendix Table 3.4.9** Household Income diversification by place of residence

| Income-diversification | South east Zone | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| | Freq. | Percent | Cum. | Freq. | Percent | Cum. | Freq. | Percent | Cum. |
| 0 | 24 | 3.06 | 3.06 | 4 | 4.35 | 4.35 | 20 | 2.89 | 2.89 |
| 1 | 554 | 70.57 | 73.63 | 64 | 69.57 | 73.91 | 490 | 70.71 | 73.59 |
| 2 | 168 | 21.40 | 95.03 | 22 | 23.91 | 97.83 | 146 | 21.07 | 94.66 |
| 3 | 32 | 4.08 | 99.11 | 2 | 2.17 | 100.00 | 30 | 4.33 | 98.99 |
| 4 | 4 | 0.51 | 99.62 | | | | 4 | 0.58 | 99.57 |
| 6 | 3 | 0.38 | 100.00 | | | | 3 | 0.43 | 100.00 |
| Total | 785 | 100.00 | | 92 | 100.00 | | 693 | 100.00 | |

**Appendix Table 3.4.10** Household Income diversification by place of residence

| Income-diversification | South east Zone | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| | Freq. | Percent | Cum. | Freq. | Percent | Cum. | Freq. | Percent | Cum. |
| 0 | 24 | 3.06 | 3.06 | 2 | 0.37 | 0.37 | 22 | 9.05 | 9.05 |
| 1 | 554 | 70.57 | 73.63 | 369 | 68.08 | 68.45 | 185 | 76.13 | 85.19 |
| 2 | 168 | 21.40 | 95.03 | 139 | 25.65 | 94.10 | 29 | 11.93 | 97.12 |
| 3 | 32 | 4.08 | 99.11 | 26 | 4.80 | 98.89 | 6 | 2.47 | 99.59 |
| 4 | 4 | 0.51 | 99.62 | 3 | 0.55 | 99.45 | 1 | 0.41 | 100.00 |
| 6 | 3 | 0.38 | 100.00 | 3 | 0.55 | 100.00 | | | |
| Total | 785 | 100.00 | | 542 | 100.00 | | 243 | 100.00 | |

**Appendix Table 3.4.11** Household Income diversification by place of residence

| Income-diversification | Western Zone | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| | Freq. | Percent | Cum. | Freq. | Percent | Cum. | Freq. | Percent | Cum. |
| 0 | 30 | 3.07 | 3.07 | 18 | 3.50 | 3.50 | 12 | 2.60 | 2.60 |
| 1 | 525 | 53.79 | 56.86 | 296 | 57.59 | 61.09 | 229 | 49.57 | 52.16 |
| 2 | 320 | 32.79 | 89.65 | 153 | 29.77 | 90.86 | 167 | 36.15 | 88.31 |
| 3 | 76 | 7.79 | 97.44 | 40 | 7.78 | 98.64 | 36 | 7.79 | 96.10 |
| 4 | 21 | 2.15 | 99.59 | 6 | 1.17 | 99.81 | 15 | 3.25 | 99.35 |
| 5 | 3 | 0.31 | 99.90 | 1 | 0.19 | 100.00 | 2 | 0.43 | 99.78 |
| 6 | 1 | 0.10 | 100.00 | | | | 1 | 0.22 | 100.00 |
| Total | 976 | 100.00 | | 514 | 100.00 | | 462 | 100.00 | |

**Appendix Table 3.4.12** Household Income diversification by place of residence

| Income-diversification | Western Zone | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| | Freq. | Percent | Cum. | Freq. | Percent | Cum. | Freq. | Percent | Cum. |
| 0 | 30 | 3.07 | 3.07 | 8 | 1.11 | 1.11 | 22 | 8.70 | 8.70 |
| 1 | 525 | 53.79 | 56.86 | 367 | 50.76 | 51.87 | 158 | 62.45 | 71.15 |
| 2 | 320 | 32.79 | 89.65 | 263 | 36.38 | 88.24 | 57 | 22.53 | 93.68 |
| 3 | 76 | 7.79 | 97.44 | 63 | 8.71 | 96.96 | 13 | 5.14 | 98.81 |
| 4 | 21 | 2.15 | 99.59 | 19 | 2.63 | 99.59 | 2 | 0.79 | 99.60 |
| 5 | 3 | 0.31 | 99.90 | 2 | 0.28 | 99.86 | 1 | 0.40 | 100.00 |
| 6 | 1 | 0.10 | 100.00 | 1 | 0.14 | 100.00 | | | |
| Total | 976 | 100.00 | | 723 | 100.00 | | 253 | 100.00 | |

**Appendix Table 3.4.13** Household Income diversification by place of residence

| Income-diversification | Mekelle zone | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| | Freq. | Percent | Cum. | Freq. | Percent | Cum. | Freq. | Percent | Cum. |
| 0 | 111 | 6.92 | 6.92 | 111 | 6.92 | 6.92 | | | |
| 1 | 819 | 51.03 | 57.94 | 819 | 51.03 | 57.94 | | | |
| 2 | 483 | 30.09 | 88.04 | 483 | 30.09 | 88.04 | | | |
| 3 | 127 | 7.91 | 95.95 | 127 | 7.91 | 95.95 | | | |
| 4 | 47 | 2.93 | 98.88 | 47 | 2.93 | 98.88 | | | |
| 5 | 12 | 0.75 | 99.63 | 12 | 0.75 | 99.63 | | | |
| 6 | 5 | 0.31 | 99.94 | 5 | 0.31 | 99.94 | | | |
| 7 | 1 | 0.06 | 100.00 | 1 | 0.06 | 100.00 | | | |
| Total | 1,605 | 100.00 | | 1,605 | 100.00 | | | | |

**Appendix Table 3.4.14** Household Income diversification by place of residence

| Income-diversification | Mekelle zone | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| | Freq. | Percent | Cum. | Freq. | Percent | Cum. | Freq. | Percent | Cum. |
| 0 | 111 | 6.92 | 6.92 | 27 | 3.02 | 3.02 | 84 | 11.80 | 11.80 |
| 1 | 819 | 51.03 | 57.94 | 424 | 47.48 | 50.50 | 395 | 55.48 | 67.28 |
| 2 | 483 | 30.09 | 88.04 | 312 | 34.94 | 85.44 | 171 | 24.02 | 91.29 |
| 3 | 127 | 7.91 | 95.95 | 84 | 9.41 | 94.85 | 43 | 6.04 | 97.33 |
| 4 | 47 | 2.93 | 98.88 | 33 | 3.70 | 98.54 | 14 | 1.97 | 99.30 |
| 5 | 12 | 0.75 | 99.63 | 8 | 0.90 | 99.44 | 4 | 0.56 | 99.86 |
| 6 | 5 | 0.31 | 99.94 | 5 | 0.56 | 100.00 | | | |
| 7 | 1 | 0.06 | 100.00 | | | | 1 | 0.14 | 100.00 |
| Total | 1,605 | 100.00 | | 893 | 100.00 | | 712 | 100.00 | |

**Appendix Table 3.4.14** Household Income diversification by place of residence

| | Central zone | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. |
| Wage income | 2,895 | 11135.46 | 890.8024 | 1,069 | 11604.99 | 1272.664 | 1,826 | 10860.58 | 1200.002 |
| Business income | 2,895 | 362.4443 | 81.48647 | 1,069 | 825.6294 | 216.3224 | 1,826 | 91.28067 | 23.50829 |
| Income from Household Female Petty Businesses | 2,895 | 11.05216 | 3.585277 | 1,069 | 29.93078 | 9.685019 | 1,826 | 0 | 0 |
| Income from Underage Children | 2,895 | 1.107772 | .5444503 | 1,069 | 1.316183 | .6910386 | 1,826 | .9857612 | .7626413 |
| Income from Remittances | 2,895 | 55.81183 | 8.739331 | 1,069 | 149.3688 | 23.36108 | 1,826 | 1.040526 | .7718725 |
| Income from pension | 2,895 | 33.10017 | 7.053694 | 1,069 | 84.09727 | 18.40605 | 1,826 | 3.244797 | 2.774744 |
| Agricultural income | 2,895 | 20712.83 | 16601.86 | 1,069 | 4573.111 | 1696.552 | 1,826 | 30161.55 | 26302.54 |
| Total income | 2,895 | 32400.72 | 16621.19 | 1,069 | 17501.91 | 2108.757 | 1,826 | 41122.97 | 26323.38 |

**Appendix Table 3.4.15** Household Income Sources by place of residence

| | Central zone | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. |
| Wage income | 2,895 | 11135.46 | 890.8024 | 2,049 | 10608.61 | 1003.639 | 846 | 12411.49 | 1839.67 |
| Business income | 2,895 | 362.4443 | 81.48647 | 2,049 | 398.6647 | 110.7274 | 846 | 274.7191 | 76.39696 |
| Income from Household Female Petty Businesses | 2,895 | 11.05216 | 3.585277 | 2,049 | 10.14885 | 4.456847 | 846 | 13.23995 | 5.834405 |
| Income from Underage Children | 2,895 | 1.107772 | .5444503 | 2,049 | 1.317716 | .7283997 | 846 | .5992908 | .5992908 |
| Income from Remittances | 2,895 | 55.81183 | 8.739331 | 2,049 | 50.37274 | 8.702897 | 846 | 68.98522 | 21.21831 |
| Income from pension | 2,895 | 33.10017 | 7.053694 | 2,049 | 31.63026 | 9.049533 | 846 | 36.66026 | 10.11766 |
| Agricultural income | 2,895 | 20712.83 | 16601.86 | 2,049 | 27228.34 | 23443.16 | 846 | 4932.341 | 1928.914 |
| Total income | 2,895 | 32400.72 | 16621.19 | 2,049 | 38411.09 | 23458.88 | 846 | 17843.68 | 2642.086 |

**Appendix Table 3.4.16** Household Income Sources by place of residence

| Variable | Eastern zone | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. |
| Wage income | 2,140 | 11198.61 | 1083.702 | 925 | 10654.38 | 1384.758 | 1,215 | 11612.95 | 1591.583 |
| Business income | 2,140 | 341.4408 | 93.21463 | 925 | 685.2594 | 210.3454 | 1,215 | 79.68587 | 34.58646 |
| Income from Household Female Petty Businesses | 2,140 | 111.9907 | 85.80597 | 925 | 259.0919 | 198.4704 | 1,215 | 0 | 0 |
| Income from Underage Children | 2,140 | 28.00047 | 27.35331 | 925 | 64.77946 | 63.28133 | 1,215 | 0 | 0 |
| Income from Remittances | 2,140 | 49.58314 | 7.323619 | 925 | 107.2669 | 16.53128 | 1,215 | 5.66749 | 2.102075 |
| Income from pension | 2,140 | 25.59565 | 7.278562 | 925 | 44.59641 | 11.77129 | 1,215 | 11.13004 | 9.149722 |
| Agricultural income | 2,140 | 24386.1 | 20959.31 | 925 | 2416.01 | 513.4603 | 1,215 | 41112.29 | 36913.27 |
| Total income | 2,140 | 36216.5 | 20981.41 | 925 | 14383.25 | 1491.108 | 1,215 | 52838.52 | 36936.92 |

**Appendix Table 3.4.16** Household Income diversification by place of residence

| Variable | Eastern zone | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. |
| Wage income | 2,140 | 11198.61 | 1083.702 | 1,314 | 11482.96 | 1349.478 | 826 | 10746.28 | 1810.466 |
| Business income | 2,140 | 341.4408 | 93.21463 | 1,314 | 426.016 | 146.8069 | 826 | 206.8987 | 61.35554 |
| Income from Household Female Petty Businesses | 2,140 | 111.9907 | 85.80597 | 1,314 | 169.1629 | 139.6632 | 826 | 21.04116 | 7.480795 |
| Income from Underage Children | 2,140 | 28.00047 | 27.35331 | 1,314 | 44.53577 | 44.53577 | 826 | 1.696126 | 1.694914 |
| Income from Remittances | 2,140 | 49.58314 | 7.323619 | 1,314 | 41.89561 | 8.88052 | 826 | 61.81245 | 12.66179 |
| Income from pension | 2,140 | 25.59565 | 7.278562 | 1,314 | 34.32815 | 11.69969 | 826 | 11.704 | 2.987277 |
| Agricultural income | 2,140 | 24386.1 | 20959.31 | 1,314 | 38520.52 | 34132.26 | 826 | 1901.074 | 531.8625 |
| Total income | 2,140 | 36216.5 | 20981.41 | 1,314 | 50795.64 | 34149.17 | 826 | 13024.03 | 1876.027 |

**Appendix Table 3.4.17** Household Income diversification by place of residence

| Variable | North Westl zone | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. |
| Wage income | 1,960 | 3584.945 | 474.5874 | 788 | 7345.442 | 960.1031 | 1,172 | 1056.556 | 447.2443 |
| Business income | 1,960 | 306569.4 | 306122.3 | 788 | 762391.2 | 761420.2 | 1,172 | 95.38559 | 24.2287 |
| Income from Household Female Petty Businesses | 1,960 | 8.004252 | 2.399104 | 788 | 19.90905 | 5.944302 | 1,172 | 0 | 0 |
| Income from Underage Children | 1,960 | 4.206633 | 1.917495 | 788 | 1.281726 | .820209 | 1,172 | 6.173208 | 3.158236 |
| Income from Remittances | 1,960 | 466.6817 | 61.54294 | 788 | 584.8364 | 117.5625 | 1,172 | 387.2398 | 65.86188 |
| Income from pension | 1,960 | 196.6207 | 54.9691 | 788 | 203.7572 | 48.74877 | 1,172 | 191.8225 | 85.90535 |
| Agricultural income | 1,960 | 3009.709 | 305.6385 | 788 | 2948.209 | 607.4538 | 1,172 | 3051.059 | 307.5791 |
| Total income | 1,960 | 314502.9 | 306118.8 | 788 | 774283.3 | 761405.9 | 1,172 | 5367.298 | 586.3159 |

**Appendix Table 3.4.18** Household Income diversification by place of residence

| Variable | North Westl zone | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. |
| Wage income | 1,960 | 3584.945 | 474.5874 | 1,417 | 3753.56 | 637.8827 | 543 | 3144.932 | 404.8874 |
| Business income | 1,960 | 306569.4 | 306122.3 | 1,417 | 395.1129 | 178.5526 | 543 | 1105555 | 1104971 |
| Income from Household Female Petty Businesses | 1,960 | 8.004252 | 2.399104 | 1,417 | 6.267937 | 2.028632 | 543 | 12.5353 | 6.854334 |
| Income from Underage Children | 1,960 | 4.206633 | 1.917495 | 1,417 | 3.401553 | 2.211713 | 543 | 6.307551 | 3.822041 |
| Income from Remittances | 1,960 | 466.6817 | 61.54294 | 1,417 | 464.0142 | 74.39432 | 543 | 473.6427 | 108.0801 |
| Income from pension | 1,960 | 196.6207 | 54.9691 | 1,417 | 205.3901 | 74.12292 | 543 | 173.7363 | 44.29701 |
| Agricultural income | 1,960 | 3009.709 | 305.6385 | 1,417 | 2955.501 | 360.2834 | 543 | 3151.169 | 577.6861 |
| Total income | 1,960 | 314502.9 | 306118.8 | 1,417 | 8452.652 | 776.3809 | 543 | 1113164 | 1104958 |

**Appendix Table 3.4.19** Household Income diversification by place of residence

| Variable | Southern zone | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. |
| Wage income | 1,954 | 8965.795 | 864.4818 | 864 | 9998.157 | 948.7386 | 1,090 | 8147.483 | 1354.922 |
| Business income | 1,954 | 460.6785 | 138.5721 | 864 | 798.1801 | 302.6347 | 1,090 | 193.1544 | 63.66766 |
| Income from Household Female Petty Businesses | 1,954 | 36.15251 | 8.571424 | 864 | 81.76157 | 19.27943 | 1,090 | 0 | 0 |
| Income from Underage Children | 1,954 | .4411464 | .352887 | 864 | .9976852 | .7979349 | 1,090 | 0 | 0 |
| Income from Remittances | 1,954 | 1080.085 | 161.8723 | 864 | 433.8365 | 100.2412 | 1,090 | 1592.341 | 278.1779 |
| Income from pension | 1,954 | 100.0246 | 22.60436 | 864 | 117.9961 | 38.43065 | 1,090 | 85.77936 | 26.73078 |
| Agricultural income | 1,954 | 8869.627 | 3756.436 | 864 | 12792.93 | 8485.452 | 1,090 | 5759.776 | 340.5341 |
| Total income | 1,954 | 20692.91 | 3872.143 | 864 | 24775.7 | 8557.469 | 1,090 | 17456.65 | 1476.841 |

**Appendix Table 3.4.20** Household Income diversification by place of residence

| Variable | Southern zone | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. |
| Wage income | 1,954 | 8965.795 | 864.4818 | 1,245 | 8519.837 | 1038.907 | 1,245 | 8519.837 | 1038.907 |
| Business income | 1,954 | 460.6785 | 138.5721 | 1,245 | 547.5301 | 210.2638 | 1,245 | 547.5301 | 210.2638 |
| Income from Household Female Petty Businesses | 1,954 | 36.15251 | 8.571424 | 1,245 | 20.51566 | 8.047782 | 1,245 | 20.51566 | 8.047782 |
| Income from Underage Children | 1,954 | .4411464 | .352887 | 1,245 | .1606426 | .1606426 | 1,245 | .1606426 | .1606426 |
| Income from Remittances | 1,954 | 1080.085 | 161.8723 | 1,245 | 908.8991 | 129.6781 | 1,245 | 908.8991 | 129.6781 |
| Income from pension | 1,954 | 100.0246 | 22.60436 | 1,245 | 98.23516 | 31.9898 | 1,245 | 98.23516 | 31.9898 |
| Agricultural income | 1,954 | 8869.627 | 3756.436 | 1,245 | 11598.77 | 5875.33 | 1,245 | 11598.77 | 5875.33 |
| Total income | 1,954 | 20692.91 | 3872.143 | 1,245 | 22701.08 | 5979.219 | 1,245 | 22701.08 | 5979.219 |

**Appendix Table 3.4.21** Household Income diversification by place of residence

| Variable | South East zone | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. |
| Wage income | 785 | 18095.69 | 2498.636 | 92 | 5881.739 | 4181.016 | 693 | 19717.17 | 2770.309 |
| Business income | 785 | 160.6953 | 54.2331 | 92 | 283.5145 | 126.8873 | 693 | 144.3903 | 59.0786 |
| Income from Household Female Petty Businesses | 785 | 0 | 0 | 92 | 0 | 0 | 693 | 0 | 0 |
| Income from Underage Children | 785 | 1.770701 | 1.539188 | 92 | 0 | 0 | 693 | 2.005772 | 1.743477 |
| Income from Remittances | 785 | 1089.717 | 134.8169 | 92 | 983.2609 | 400.2528 | 693 | 1103.85 | 143.2707 |
| Income from pension | 785 | 143.6115 | 36.94092 | 92 | 538.6413 | 223.7436 | 693 | 91.16883 | 29.04195 |
| Agricultural income | 785 | 46777.07 | 38316.9 | 92 | 2479.236 | 471.5412 | 693 | 52657.88 | 43402.43 |
| Total income | 785 | 67501.89 | 38370.34 | 92 | 11688.29 | 4375.435 | 693 | 74911.49 | 43456.28 |

**Appendix Table 3.4.22** Household Income diversification by place of residence

| Variable | South East zone | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. |
| Wage income | 785 | 18095.69 | 2498.636 | 542 | 17125.35 | 2929.95 | 243 | 20260 | 4743.997 |
| Business income | 785 | 160.6953 | 54.2331 | 542 | 124.6079 | 66.675 | 243 | 241.1866 | 92.60806 |
| Income from Household Female Petty Businesses | 785 | 0 | 0 | 542 | 0 | 0 | 243 | 0 | 0 |
| Income from Underage Children | 785 | 1.770701 | 1.539188 | 542 | 2.564576 | 2.22906 | 243 | 0 | 0 |
| Income from Remittances | 785 | 1089.717 | 134.8169 | 542 | 1114.69 | 175.4039 | 243 | 1034.016 | 191.8077 |
| Income from pension | 785 | 143.6115 | 36.94092 | 542 | 125.4151 | 42.73974 | 243 | 184.1975 | 71.85751 |
| Agricultural income | 785 | 46777.07 | 38316.9 | 542 | 63353.14 | 55436.85 | 243 | 9804.947 | 5767.28 |
| Total income | 785 | 67501.89 | 38370.34 | 542 | 83085.87 | 55476.92 | 243 | 32742.56 | 7411.933 |

**Appendix Table 3.4.23** Household Income diversification by place of residence

| Variable | Western zone | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. |
| Wage income | 976 | 4413.302 | 979.9251 | 514 | 6402.042 | 1589.066 | 462 | 2200.721 | 1069.579 |
| Business income | 976 | 1246.621 | 775.1203 | 514 | 1990.238 | 1462.971 | 462 | 419.3077 | 178.389 |
| Income from Household Female Petty Businesses | 976 | 14.05635 | 5.132322 | 514 | 26.69066 | 9.716148 | 462 | 0 | 0 |
| Income from Underage Children | 976 | .307377 | .2172369 | 514 | .5836576 | .4123058 | 462 | 0 | 0 |
| Income from Remittances | 976 | 359.9037 | 105.2066 | 514 | 351.7432 | 179.383 | 462 | 368.9827 | 98.0562 |
| Income from pension | 976 | 350.557 | 103.9103 | 514 | 368.0422 | 183.9784 | 462 | 331.1039 | 79.5943 |
| Agricultural income | 976 | 3608.696 | 690.3488 | 514 | 2760.139 | 446.0498 | 462 | 4552.762 | 1370.899 |
| Total income | 976 | 10703.91 | 1468.416 | 514 | 12619.26 | 2284.971 | 462 | 8572.965 | 1775.217 |

**Appendix Table 3.4.24** Household Income diversification by place of residence

| Variable | Western zone | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. |
| Wage income | 976 | 4413.302 | 979.9251 | 723 | 3781.302 | 879.7616 | 253 | 6219.375 | 2824.522 |
| Business income | 976 | 1246.621 | 775.1203 | 723 | 1489.631 | 1044.314 | 253 | 552.1703 | 188.7659 |
| Income from Household Female Petty Businesses | 976 | 14.05635 | 5.132322 | 723 | 14.70954 | 6.348854 | 253 | 12.18972 | 7.944202 |
| Income from Underage Children | 976 | .307377 | .2172369 | 723 | .2074689 | .2074689 | 253 | .5928854 | .5928854 |
| Income from Remittances | 976 | 359.9037 | 105.2066 | 723 | 274.1555 | 63.15848 | 253 | 604.947 | 363.6232 |
| Income from pension | 976 | 350.557 | 103.9103 | 723 | 277.2393 | 59.70381 | 253 | 560.0777 | 362.9563 |
| Agricultural income | 976 | 3608.696 | 690.3488 | 723 | 4001.035 | 916.311 | 253 | 2487.506 | 481.7363 |
| Total income | 976 | 10703.91 | 1468.416 | 723 | 10389.67 | 1644.529 | 253 | 11601.88 | 3167.964 |

**Appendix Table 3.4.25** Household Income diversification by place of residence

| Variable | Mekelle zone | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. |
| Wage income | 1,605 | 13579.79 | 1413.542 | 1,605 | 13579.79 | 1413.542 | | | |
| Business income | 1,605 | 2442.813 | 795.521 | 1,605 | 2442.813 | 795.521 | | | |
| Income from Household Female Petty Businesses | 1,605 | 190.7452 | 59.48002 | 1,605 | 190.7452 | 59.48002 | | | |
| Income from Underage Children | 1,605 | 7.707165 | 4.922428 | 1,605 | 7.707165 | 4.922428 | | | |
| Income from Remittances | 1,605 | 233.5631 | 26.5722 | 1,605 | 233.5631 | 26.5722 | | | |
| Income from pension | 1,605 | 85.09238 | 9.096194 | 1,605 | 85.09238 | 9.096194 | | | |
| Agricultural income | 1,605 | 3485.442 | 913.0481 | 1,605 | 3485.442 | 913.0481 | | | |
| Total income | 1,605 | 20343.8 | 1855.156 | 1,605 | 20343.8 | 1855.156 | | | |

**Appendix Table 3.4.26** Household Income diversification by place of residence

| Variable | Mekelle zone | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. |
| Wage income | 1,605 | 13579.79 | 1413.542 | 893 | 14265.65 | 1552.048 | 712 | 12719.57 | 2523.698 |
| Business income | 1,605 | 2442.813 | 795.521 | 893 | 2199.136 | 733.8347 | 712 | 2748.435 | 1539.728 |
| Income from Household Female Petty Businesses | 1,605 | 190.7452 | 59.48002 | 893 | 201.804 | 84.24415 | 712 | 176.875 | 82.60725 |
| Income from Underage Children | 1,605 | 7.707165 | 4.922428 | 893 | 4.50168 | 3.521508 | 712 | 11.72753 | 10.18176 |
| Income from Remittances | 1,605 | 233.5631 | 26.5722 | 893 | 275.6053 | 42.50725 | 712 | 180.8332 | 27.21426 |
| Income from pension | 1,605 | 85.09238 | 9.096194 | 893 | 86.64681 | 11.56033 | 712 | 83.14279 | 14.50794 |
| Agricultural income | 1,605 | 3485.442 | 913.0481 | 893 | 3991.241 | 1401.022 | 712 | 2851.062 | 1072.354 |
| Total income | 1,605 | 20343.8 | 1855.156 | 893 | 21386.84 | 2204.674 | 712 | 19035.62 | 3138.417 |

**Appendix Table 3.4.27** Household **Income category: Employment income**

| | Regional | Central | Eastern | Nwest | Southern | SouthE | Western | Mekelle |
|---|---|---|---|---|---|---|---|---|
| 0 | 9563 | 2323 | 175 | 1673 | 1496 | 691 | 834 | 769 |
| 0-1000 | 14 | 8 | 0 | 3 | 1 | 0 | 1 | 1 |
| 1001-5000 | 485 | 92 | 56 | 49 | 83 | 7 | 26 | 172 |
| 5001-10000 | 512 | 99 | 52 | 62 | 89 | 8 | 34 | 168 |
| 10001-15000 | 334 | 47 | 46 | 43 | 50 | 3 | 19 | 126 |
| 15001-20000 | 335 | 73 | 46 | 42 | 65 | 5 | 20 | 84 |
| 20001-25000 | 191 | 29 | 21 | 20 | 36 | 4 | 9 | 72 |
| >25001 | 883 | 224 | 144 | 68 | 134 | 67 | 33 | 213 |

**Appendix Table 3.4.28** Household **Income category: :Business income**

| | Regional | Central | Eastern | Nwest | Southern | SouthE | Western | Mekelle |
|---|---|---|---|---|---|---|---|---|
| 0 | 11,060 | 2652 | 1993 | 1787 | 1774 | 750 | 859 | 1243 |
| 0-1000 | 582 | 116 | 69 | 81 | 83 | 14 | 58 | 161 |
| 1001-5000 | 451 | 87 | 52 | 68 | 65 | 16 | 42 | 121 |
| 5001-10000 | 97 | 20 | 11 | 15 | 17 | 2 | 4 | 28 |
| 10001-15000 | 35 | 6 | 4 | 0 | 7 | 2 | 3 | 13 |
| 15001-20000 | 20 | 4 | 4 | 1 | 1 | 0 | 2 | 8 |
| 20001-25000 | 16 | 1 | 2 | 4 | 2 | 0 | 3 | 4 |
| >25001 | 56 | 9 | 5 | 4 | 5 | 1 | 5 | 27 |

**Appendix Table 3.4.29** Household **Income category: Female Business income**

| | Regional | Central | Eastern | Nwest | Southern | SouthE | Western | Mekelle |
|---|---|---|---|---|---|---|---|---|
| 0 | 12,065 | 2859 | 2105 | 1933 | 1901 | 785 | 961 | 1519 |
| 0-1000 | 168 | 28 | 19 | 24 | 35 | 0 | 10 | 52 |
| 1001-5000 | 66 | 7 | 13 | 3 | 15 | 0 | 5 | 23 |
| 5001-10000 | 9 | 1 | 2 | 0 | 3 | 0 | 0 | 3 |
| 10001-15000 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 15001-20000 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 20001-25000 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| >25001 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 2 |

**Appendix Table 3.4.30** Household **Income category: Underage income**

| Income range | Regional | Central | Eastern | Nwest | Southern | SouthE | Western | Mekelle |
|---|---|---|---|---|---|---|---|---|
| 0 | 12279 | 2889 | 2137 | 1948 | 1951 | 782 | 974 | 1596 |
| 0-1000 | 29 | 5 | 1 | 9 | 3 | 2 | 2 | 7 |
| 1001-5000 | 7 | 1 | 1 | 3 | 0 | 1 | 0 | 1 |
| 5001-10000 | 1 | 0 | 0 | 0 | 0 | 00 | 0 | 1 |
| 10001-15000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15001-20000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20001-25000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| >25001 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

**Appendix Table 3.4.31** Household **Income category: Remittance income**

| | Regional | Regional | Central | Eastern | Nwest | Southern | SouthE | Western |
|---|---|---|---|---|---|---|---|---|
| 0 | 10818 | 2738 | 2032 | 1727 | 1557 | 579 | 894 | 1289 |
| 0-1000 | 739 | 117 | 78 | 100 | 141 | 43 | 34 | 226 |
| 1001-5000 | 553 | 36 | 29 | 89 | 166 | 121 | 31 | 81 |
| 5001-10000 | 119 | 1 | 1 | 21 | 57 | 23 | 12 | 4 |
| 10001-15000 | 39 | 3 | 0 | 11 | 9 | 11 | 2 | 3 |
| 15001-20000 | 15 | 0 | 0 | 7 | 6 | 1 | 0 | 1 |
| 20001-25000 | 10 | 0 | 0 | 0 | 5 | 3 | 1 | 1 |
| >25001 | 24 | 0 | 0 | 5 | 13 | 4 | 2 | 0 |

**Appendix Table 3.4.32** Household **Income category: Pension income**

| | Regional | Central | Eastern | Nwest | Southern | SouthE | Western | Mekelle |
|---|---|---|---|---|---|---|---|---|
| 0 | 11543 | 2723 | 2010 | 1852 | 1846 | 766 | 916 | 1428 |
| 0-1000 | 589 | 149 | 120 | 65 | 79 | 1 | 29 | 146 |
| 1001-5000 | 111 | 20 | 8 | 22 | 18 | 7 | 6 | 30 |
| 5001-10000 | 58 | 2 | 1 | 14 | 9 | 10 | 21 | 1 |
| 10001-15000 | 9 | 1 | 1 | 5 | 0 | 1 | 1 | 0 |
| 15001-20000 | 3 | 0 | 0 | 0 | 1 | 0 | 2 | 0 |
| 20001-25000 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| >25001 | 3 | 0 | 0 | 1 | 1 | 0 | 1 | 0 |

**Appendix Table 3.4.33** Household **Income category: Agricultural income**

| | Regional | Central | Eastern | Nwest | Southern | SouthE | Western | Mekelle |
|---|---|---|---|---|---|---|---|---|
| 0 | 8809 | 1962 | 1545 | 1426 | 1279 | 403 | 761 | 1432 |
| 0-1000 | 502 | 153 | 138 | 65 | 46 | 36 | 24 | 40 |
| 1001-5000 | 1194 | 325 | 261 | 186 | 186 | 135 | 58 | 42 |
| 5001-10000 | 806 | 231 | 97 | 124 | 188 | 107 | 39 | 20 |
| 10001-15000 | 405 | 107 | 40 | 66 | 95 | 43 | 33 | 21 |
| 15001-20000 | 195 | 51 | 11 | 27 | 55 | 26 | 15 | 10 |
| 20001-25000 | 116 | 19 | 10 | 22 | 32 | 10 | 14 | 9 |
| >25001 | 289 | 47 | 38 | 43 | 73 | 25 | 32 | 31 |

**Appendix Table 3.4.34** Household **Income category: total income**

| | Regional | Central | Eastern | Nwest | Southern | SouthE | Western | Mekelle |
|---|---|---|---|---|---|---|---|---|
| 0 | 4495 | 1152 | 992 | 865 | 542 | 243 | 471 | 229 |
| 0-1000 | 1097 | 309 | 233 | 142 | 136 | 28 | 73 | 176 |
| 1001-5000 | 2136 | 489 | 376 | 314 | 332 | 147 | 127 | 350 |
| 5001-10000 | 1399 | 321 | 159 | 223 | 280 | 116 | 81 | 219 |
| 10001-15000 | 841 | 157 | 92 | 120 | 177 | 74 | 56 | 165 |
| 15001-20000 | 584 | 121 | 60 | 90 | 137 | 41 | 48 | 87 |
| 20001-25000 | 367 | 53 | 35 | 56 | 83 | 25 | 32 | 83 |
| >25001 | 1397 | 293 | 193 | 149 | 267 | 111 | 88 | 296 |

## Urban areas

Appendix Table 3.5.1: Possession of durable goods in the surveyed zones (n=4170)

| Durable goods | Administration zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mekelle | | Southern | | N.Western | | Western | | eastern | | Central | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Radio | 342 | 8.2 | 54 | 1.29 | 53 | 1.27 | 19 | 0.46 | 91 | 2.18 | 128 | 3.07 |
| Tape recorder | 445 | 10.67 | 120 | 2.88 | 43 | 1.03 | 20 | 0.48 | 84 | 2.01 | 102 | 2.45 |
| Television | 1308 | 31.37 | 434 | 10.41 | 367 | 8.8 | 201 | 4.82 | 367 | 8.8 | 518 | 12.42 |
| Dish receiver | 1155 | 27.7 | 411 | 9.86 | 317 | 7.6 | 183 | 4.39 | 288 | 6.9 | 404 | 9.69 |
| Video | 84 | 2.01 | 18 | 0.43 | 19 | 0.46 | 5 | 0.12 | 18 | 0.43 | 26 | 0.62 |
| Motor cycle | 36 | 0.86 | 4 | 0.1 | 7 | 0.17 | 16 | 0.38 | 6 | 0.14 | 8 | 0.19 |
| Refrigerator | 747 | 17.91 | 138 | 3.3 | 215 | 5.16 | 151 | 3.62 | 149 | 3.57 | 213 | 5.11 |
| Bed | 1459 | 34.99 | 570 | 13.67 | 456 | 10.94 | 238 | 5.71 | 443 | 10.62 | 652 | 15.64 |
| Chair | 592 | 14.2 | 201 | 4.82 | 361 | 8.66 | 209 | 5.01 | 202 | 4.84 | 347 | 8.32 |
| Table | 690 | 9.66 | 257 | 6.16 | 283 | 6.79 | 170 | 4.08 | 244 | 5.85 | 340 | 8.15 |
| Electric Megogo | 926 | 22.21 | 245 | 5.88 | 218 | 5.23 | 75 | 1.8 | 277 | 6.64 | 407 | 9.76 |
| Electric Stove | 920 | 22.06 | 237 | 5.68 | 142 | 3.41 | 89 | 2.13 | 220 | 5.28 | 335 | 8.03 |
| Heater | 79 | 1.89 | 15 | 0.36 | 10 | 0.24 | 3 | 0.07 | 12 | 0.29 | 16 | 0.38 |
| Juicer | 148 | 3.55 | 23 | 0.55 | 20 | 0.48 | 19 | 0.46 | 22 | 0.53 | 31 | 0.74 |
| Gas stove | 59 | 1.41 | 10 | 0.24 | 11 | 0.26 | 5 | 0.12 | 18 | 0.43 | 26 | 0.62 |
| Traditional Oven | 109 | 2.61 | 119 | 2.85 | 97 | 2.33 | 64 | 1.53 | 61 | 1.46 | 113 | 2.71 |
| Gold | 641 | 15.37 | 197 | 4.72 | 209 | 5.01 | 100 | 2.4 | 189 | 4.53 | 207 | 4.96 |
| Silver | 550 | 13.19 | 143 | 3.43 | 101 | 2.42 | 54 | 1.29 | 147 | 3.53 | 154 | 3.69 |
| Watch | 238 | 5.71 | 52 | 1.25 | 32 | 0.77 | 13 | 0.31 | 63 | 1.51 | 61 | 1.46 |
| Sofa | 836 | 20.04 | 137 | 3.29 | 142 | 3.41 | 38 | 0.91 | 194 | 4.65 | 259 | 6.21 |
| Cupboard (Armadiyo) | 793 | 19.02 | 106 | 2.54 | 127 | 3.05 | 45 | 1.08 | 169 | 4.05 | 186 | 4.46 |
| Bicycle | 134 | 3.21 | 20 | 0.48 | 111 | 2.67 | 25 | 0.6 | 27 | 0.65 | 49 | 1.18 |
| Mobile phone | 1376 | 32.99 | 543 | 13.02 | 409 | 9.8 | 208 | 4.99 | 384 | 9.21 | 575 | 13.79 |
| Cupboard goods | 860 | 20.62 | 209 | 5.01 | 222 | 5.32 | 97 | 2.33 | 169 | 4.05 | 227 | 5.44 |
| Car | 80 | 1.91 | 17 | 0.41 | 10 | 0.24 | 16 | 0.38 | 9 | 0.22 | 10 | 0.24 |
| Singer (sefayt Aleba) | 31 | 0.74 | 10 | 0.24 | 14 | 0.34 | 3 | 0.07 | 6 | 0.14 | 16 | 0.38 |
| Washing Machine | 54 | 1.29 | 4 | 0.1 | 4 | 0.1 | 2 | 0.05 | 8 | 0.19 | 16 | 0.38 |
| Iron Machine | 118 | 2.83 | 13 | 0.31 | 15 | 0.36 | 16 | 0.38 | 22 | 0.53 | 28 | 0.67 |
| Laptop computer | 176 | 4.22 | 21 | 0.50 | 16 | 0.38 | 14 | 0.34 | 29 | 0.7 | 21 | 0.50 |
| Desktop computer | 29 | 0.69 | 6 | 0.14 | 6 | 0.14 | 5 | 0.12 | 2 | 0.05 | 6 | 0.14 |
| Tablet computer | 30 | 0.72 | 4 | 0.1 | 2 | 0.05 | 3 | 0.07 | 4 | 0.1 | 10 | 0.24 |
| House | 458 | 10.98 | 239 | 5.73 | 212 | 5.08 | 104 | 2.49 | 211 | 5.06 | 364 | 8.73 |

**Infant towns**

Appendix Table 3.5.1: Possession of durable goods in the surveyed zones (n=1687)

| Durable goods | Administration zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Radio | 76 | 4.51 | 91 | 5.39 | 58 | 3.44 | 18 | 1.07 | 14 | 0.83 | 41 | 2.43 |
| Tape recorder | 33 | 1.96 | 37 | 2.19 | 11 | 0.65 | 22 | 1.30 | 12 | 0.71 | 17 | 1.01 |
| Television | 157 | 9.31 | 206 | 12.21 | 65 | 3.85 | 60 | 3.56 | 38 | 2.25 | 105 | 6.22 |
| Berad | 91 | 5.39 | 123 | 7.29 | 184 | 10.91 | 88 | 5.22 | 42 | 2.49 | 194 | 11.50 |
| Pot | 28 | 1.66 | 23 | 1.36 | 78 | 4.62 | 20 | 1.19 | 11 | 0.65 | 16 | 0.95 |
| Refrigerator | 56 | 3.32 | 59 | 3.50 | 22 | 1.30 | 17 | 1.01 | 9 | 0.53 | 49 | 2.90 |
| Bed | 282 | 16.72 | 350 | 20.75 | 227 | 13.46 | 102 | 6.04 | 63 | 3.73 | 258 | 15.29 |
| Chair | 162 | 9.60 | 139 | 8.24 | 166 | 9.84 | 45 | 2.67 | 25 | 1.48 | 200 | 11.86 |
| Table | 125 | 7.41 | 107 | 6.34 | 62 | 3.68 | 40 | 2.37 | 22 | 1.30 | 130 | 7.71 |
| Electric Megogo | 120 | 7.11 | 157 | 9.31 | 23 | 1.36 | 40 | 2.37 | 24 | 1.42 | 9 | 0.53 |
| Traditional Megogo | 83 | 4.92 | 125 | 7.41 | 243 | 14.40 | 99 | 5.87 | 58 | 3.44 | 228 | 13.52 |
| Improved Stove | 1 | 0.06 | 4 | 0.24 | 0 | - | 3 | 0.18 | 1 | 0.06 | 1 | 0.06 |
| Traditional lamp | 0 | - | 1 | 0.06 | 2 | 0.12 | 1 | 0.06 | 0 | - | 0 | - |
| Permus | 6 | 0.36 | 5 | 0.30 | 11 | 0.65 | 22 | 1.30 | 13 | 0.77 | 17 | 1.01 |
| Gas stove | 38 | 2.25 | 46 | 2.73 | 7 | 0.41 | 11 | 0.65 | 3 | 0.18 | 3 | 0.18 |
| Traditional Oven | 14 | 0.83 | 35 | 2.07 | 50 | 2.96 | 15 | 0.89 | 3 | 0.18 | 32 | 1.90 |
| Charcoal stove | 44 | 2.61 | 45 | 2.67 | 31 | 1.84 | 39 | 2.31 | 18 | 1.07 | 20 | 1.19 |
| Gold (grams) | 35 | 2.07 | 38 | 2.25 | 76 | 4.51 | 35 | 2.07 | 22 | 1.30 | 69 | 4.09 |
| Silver (grams) | 25 | 1.48 | 36 | 2.13 | 17 | 1.01 | 20 | 1.19 | 28 | 1.66 | 18 | 1.07 |
| Watch | 2 | 0.12 | 3 | 0.18 | 8 | 0.47 | 3 | 0.18 | 1 | 0.06 | 10 | 0.59 |
| Sofa | 9 | 0.53 | 8 | 0.47 | 11 | 0.65 | 12 | 0.71 | 5 | 0.30 | 8 | 0.47 |
| Cupboard (Armadiyo) | 19 | 1.13 | 29 | 1.72 | 36 | 2.13 | 21 | 1.24 | 16 | 0.95 | 36 | 2.13 |
| Bicycle | 1 | 0.06 | 1 | 0.06 | 7 | 0.41 | 1 | 0.06 | 0 | - | 10 | 0.59 |
| Mobile phone | 164 | 9.72 | 216 | 12.80 | 174 | 10.31 | 111 | 6.58 | 61 | 3.62 | 201 | 11.91 |
| Barrel | 28 | 1.66 | 17 | 1.01 | 142 | 8.42 | 89 | 5.28 | 37 | 2.19 | 147 | 8.71 |
| Jerican | 89 | 5.28 | 152 | 9.01 | 288 | 17.07 | 151 | 8.95 | 79 | 4.68 | 255 | 15.12 |
| Masho | 1 | 0.06 | 6 | 0.36 | 4 | 0.24 | 12 | 0.71 | 0 | - | 3 | 0.18 |
| Car | 0 | - | 0 | - | 4 | 0.24 | 1 | 0.06 | 0 | - | 6 | 0.36 |
| House | 38 | 2.25 | 47 | 2.79 | 205 | 12.15 | 98 | 5.81 | 68 | 4.03 | 195 | 11.56 |

Appendix Table 3.5.2: Possession of Farm implements by place of residence (n=1687)

| **Farm implements** | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Mulue Mesarie | 56 | 3.32 | 96 | 5.69 | 169 | 10.02 | 76 | 4.51 | 34 | 2.02 | 82 | 4.86 |
| Hoe | 68 | 4.03 | 104 | 6.16 | 168 | 9.96 | 81 | 4.80 | 33 | 1.96 | 127 | 7.52 |
| Shovel | 63 | 3.73 | 97 | 5.75 | 174 | 10.31 | 61 | 3.62 | 39 | 2.31 | 121 | 7.17 |
| Sickle | 75 | 4.45 | 115 | 6.81 | 195 | 11.56 | 93 | 5.51 | 44 | 2.61 | 153 | 9.07 |
| Hammer | 20 | 1.19 | 39 | 2.31 | 66 | 3.91 | 23 | 1.36 | 9 | 0.53 | 38 | 2.25 |
| Axe | 50 | 2.96 | 86 | 5.10 | 154 | 9.13 | 66 | 3.91 | 28 | 1.66 | 114 | 6.76 |
| Saw | 4 | 0.24 | 11 | 0.65 | 24 | 1.42 | 15 | 0.89 | 5 | 0.30 | 15 | 0.89 |
| Wheelbarrow | 5 | 0.30 | 13 | 0.77 | 24 | 1.42 | 16 | 0.95 | 5 | 0.30 | 15 | 0.89 |
| Cart | 0 | - | 5 | 0.30 | 4 | 0.24 | 3 | 0.18 | 2 | 0.12 | 22 | 1.30 |
| Generator | 1 | 0.06 | 3 | 0.18 | 6 | 0.36 | 1 | 0.06 | 0 | - | 4 | 0.24 |
| Tridle pump | 0 | - | 2 | 0.12 | 6 | 0.36 | 1 | 0.06 | 1 | 0.06 | 2 | 0.12 |
| Drip | 0 | - | 0 | - | 4 | 0.24 | 3 | 0.18 | 0 | - | 1 | 0.06 |
| Traditional beehive | 3 | 0.18 | 6 | 0.36 | 17 | 1.01 | 4 | 0.24 | 0 | - | 7 | 0.41 |
| Modern beehive | 2 | 0.12 | 1 | 0.06 | 7 | 0.41 | 3 | 0.18 | 0 | - | 2 | 0.12 |
| Chemical sprayer | 0 | - | 1 | 0.06 | 10 | 0.59 | 3 | 0.18 | 1 | 0.06 | 11 | 0.65 |
| Mechanical water pump | 0 | - | 1 | 0.06 | 3 | 0.18 | 1 | 0.06 | 0 | - | 1 | 0.06 |
| Oil based water generator | 0 | - | 1 | 0.06 | 4 | 0.24 | 1 | 0.06 | 0 | - | 1 | 0.06 |
| Traditional mill | 3 | 0.18 | 8 | 0.47 | 55 | 3.26 | 15 | 0.89 | 2 | 0.12 | 24 | 1.42 |
| Modern mill house | 1 | 0.06 | 0 | - | 3 | 0.18 | 0 | - | 0 | - | 0 | - |
| B.B.A.M | 0 | - | 1 | 0.06 | 3 | 0.18 | 1 | 0.06 | 0 | - | 1 | 0.06 |
| Small tractor | 0 | - | 0 | - | 3 | 0.18 | 3 | 0.18 | 0 | - | 5 | 0.30 |
| Hand pulled tractor | 0 | - | 0 | - | 3 | 0.18 | 3 | 0.18 | 0 | - | 1 | 0.06 |

**Rural areas**

Appendix Table 3.5.1: Possession of durable goods in the surveyed zones (n=6459)

| Durable goods | Administration zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Radio | 331 | 5.12 | 242 | 3.75 | 208 | 3.22 | 137 | 2.12 | 150 | 2.32 | 47 | 0.73 |
| Tape recorder | 27 | 0.42 | 22 | 0.34 | 55 | 0.85 | 28 | 0.43 | 29 | 0.45 | 12 | 0.19 |
| Television | 48 | 0.74 | 71 | 1.10 | 102 | 1.58 | 65 | 1.01 | 43 | 0.67 | 73 | 1.13 |
| Berad | 694 | 10.74 | 458 | 7.09 | 642 | 9.94 | 479 | 7.42 | 310 | 4.80 | 257 | 3.98 |
| Pot | 569 | 8.81 | 216 | 3.34 | 398 | 6.16 | 203 | 3.14 | 141 | 2.18 | 85 | 1.32 |
| Refrigerator | 16 | 0.25 | 23 | 0.36 | 47 | 0.73 | 13 | 0.20 | 7 | 0.11 | 35 | 0.54 |
| Bed | 482 | 7.46 | 417 | 6.46 | 749 | 11.60 | 335 | 5.19 | 250 | 3.87 | 383 | 5.93 |
| Chair | 146 | 2.26 | 87 | 1.34 | 474 | 7.34 | 99 | 1.53 | 44 | 0.68 | 288 | 4.46 |
| Table | 95 | 1.47 | 77 | 1.19 | 132 | 2.04 | 72 | 1.11 | 63 | 0.98 | 116 | 1.80 |
| Electric Megogo | 36 | 0.56 | 47 | 0.73 | 53 | 0.82 | 48 | 0.74 | 39 | 0.60 | 13 | 0.20 |
| Traditional Megogo | 1357 | 21.01 | 796 | 12.32 | 963 | 14.91 | 734 | 11.36 | 527 | 8.16 | 370 | 5.73 |
| Improved Stove | 8 | 0.12 | 7 | 0.11 | 3 | 0.05 | 18 | 0.28 | 12 | 0.19 | 0 | - |
| Traditional lamp | 10 | 0.15 | 12 | 0.19 | 4 | 0.06 | 9 | 0.14 | 4 | 0.06 | 0 | - |
| Permus | 24 | 0.37 | 16 | 0.25 | 38 | 0.59 | 55 | 0.85 | 24 | 0.37 | 14 | 0.22 |
| Gas stove | 13 | 0.20 | 17 | 0.26 | 20 | 0.31 | 12 | 0.19 | 7 | 0.11 | 6 | 0.09 |
| Traditional Oven | 150 | 2.32 | 112 | 1.73 | 159 | 2.46 | 79 | 1.22 | 23 | 0.36 | 60 | 0.93 |
| Charcoal stove | 350 | 5.42 | 206 | 3.19 | 128 | 1.98 | 214 | 3.31 | 142 | 2.20 | 36 | 0.56 |
| Gold (grams) | 79 | 1.23 | 89 | 1.38 | 187 | 2.90 | 108 | 1.67 | 66 | 1.02 | 81 | 1.25 |
| Silver (grams) | 87 | 1.35 | 75 | 1.16 | 45 | 0.70 | 63 | 0.98 | 99 | 1.53 | 22 | 0.34 |
| Watch | 20 | 0.31 | 16 | 0.25 | 30 | 0.46 | 32 | 0.50 | 10 | 0.15 | 9 | 0.14 |
| Sofa | 0 | - | 4 | 0.06 | 16 | 0.25 | 7 | 0.11 | 6 | 0.09 | 5 | 0.08 |
| Cupboard (Armadiyo) | 19 | 0.29 | 27 | 0.42 | 56 | 0.87 | 36 | 0.56 | 22 | 0.34 | 21 | 0.33 |
| Bicycle | 5 | 0.08 | 4 | 0.06 | 18 | 0.28 | 3 | 0.05 | 3 | 0.05 | 8 | 0.12 |
| Mobile phone | 821 | 12.71 | 599 | 9.27 | 592 | 9.17 | 543 | 8.41 | 324 | 5.02 | 277 | 4.29 |
| Barrel | 240 | 3.72 | 144 | 2.23 | 422 | 6.53 | 362 | 5.60 | 267 | 4.13 | 135 | 2.09 |
| Jerican | 1272 | 19.69 | 760 | 11.77 | 1063 | 16.46 | 969 | 15.00 | 640 | 9.91 | 417 | 6.46 |
| Masho | 53 | 0.82 | 25 | 0.39 | 37 | 0.57 | 79 | 1.22 | 65 | 1.01 | 6 | 0.09 |
| Car | 0 | - | 0 | - | 5 | 0.08 | 0 | - | 2 | 0.03 | 3 | 0.05 |
| House | 686 | 10.62 | 358 | 5.54 | 811 | 12.56 | 778 | 12.05 | 523 | 8.10 | 313 | 4.85 |

Appendix Table 3.5.2: Possession of Farm implements by place of residence (n=6459)

| **Farm implements** | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Mulue Mesarie | 1245 | 19.28 | 755 | 11.69 | 702 | 10.87 | 750 | 11.61 | 450 | 6.97 | 256 | 3.96 |
| Hoe | 1159 | 17.94 | 726 | 11.24 | 735 | 11.38 | 706 | 10.93 | 381 | 5.90 | 242 | 3.75 |
| Shovel | 1105 | 17.11 | 703 | 10.88 | 736 | 11.39 | 592 | 9.17 | 360 | 5.57 | 238 | 3.68 |
| Sickle | 1293 | 20.02 | 796 | 12.32 | 864 | 13.38 | 846 | 13.10 | 505 | 7.82 | 314 | 4.86 |
| Hammer | 362 | 5.60 | 235 | 3.64 | 236 | 3.65 | 146 | 2.26 | 108 | 1.67 | 56 | 0.87 |
| Axe | 990 | 15.33 | 613 | 9.49 | 676 | 10.47 | 598 | 9.26 | 353 | 5.47 | 210 | 3.25 |
| Saw | 101 | 1.56 | 86 | 1.33 | 86 | 1.33 | 92 | 1.42 | 43 | 0.67 | 36 | 0.56 |
| Wheelbarrow | 103 | 1.59 | 92 | 1.42 | 87 | 1.35 | 95 | 1.47 | 45 | 0.70 | 38 | 0.59 |
| Cart | 14 | 0.22 | 8 | 0.12 | 19 | 0.29 | 17 | 0.26 | 0 | - | 10 | 0.15 |
| Generator | 27 | 0.42 | 16 | 0.25 | 21 | 0.33 | 2 | 0.03 | 0 | - | 10 | 0.15 |
| Tridle pump | 20 | 0.31 | 11 | 0.17 | 23 | 0.36 | 1 | 0.02 | 4 | 0.06 | 9 | 0.14 |
| Drip | 8 | 0.12 | 8 | 0.12 | 8 | 0.12 | 9 | 0.140.0.37 | 2 | 0.03 | 3 | 0.05 |
| Traditional beehive | 65 | 1.01 | 47 | 0.73 | 72 | 1.14 | 24 | 0.37 | 14 | 0.22 | 23 | 0.36 |
| Modern beehive | 34 | 0.53 | 26 | 0.40 | 18 | 0.28 | 15 | 0.23 | 9 | 0.14 | 10 | 0.15 |
| Chemical sprayer | 22 | 0.34 | 9 | 0.14 | 40 | 0.62 | 12 | 0.19 | 8 | 0.12 | 18 | 0.28 |
| Mechanical water pump | 11 | 0.17 | 7 | 0.11 | 10 | 0.15 | 1 | 0.02 | 1 | 0.02 | 6 | 0.09 |
| Oil based water generator | 15 | 0.23 | 12 | 0.19 | 13 | 0.20 | 1 | 0.02 | 3 | 0.05 | 7 | 0.11 |
| Traditional mill | 155 | 2.40 | 85 | 1.32 | 280 | 4.34 | 103 | 1.59 | 45 | 0.70 | 75 | 1.16 |
| Modern mill house | 2 | 0.03 | 0 | - | 1 | 0.02 | 2 | 0.03 | 1 | 0.02 | 1 | 0.02 |
| B.B.A.M | 12 | 0.19 | 8 | 0.12 | 12 | 0.12 | 1 | 0.02 | 1 | 0.02 | 6 | 0.09 |
| Small tractor | 8 | 0.12 | 7 | 0.11 | 8 | 0.12 | 3 | 0.05 | 2 | 0.03 | 3 | 0.05 |
| Hand pulled tractor | 8 | 0.12 | 7 | 0.11 | 8 | 0.12 | 3 | 0.05 | 2 | 0.03 | 3 | 0.05 |

Appendix Table 3.6.1**Mean and standard error of annual expenditures of Households for different items (in birr) by zone**

| | Central | | | Eastern | | | Nwest | | | Southern | | | SouthE | | | Western | | | Mekelle | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | SE. | Obs | Mean | SE. | Obs | Mean | SE. | Obs | Mean | SE. | Obs | Mean | SE. | Obs | Mean | SE. | Obs | Mean | SE. |
| cereals | 2,895 | 14426 | 273 | 2,140 | 13382 | 310 | 1,960 | 15642 | 312 | 1,954 | 14179 | 325 | 785 | 14963 | 445 | 976 | 13699 | 521 | 1,605 | 14948 | 358 |
| pulses | 2,895 | 1734 | 38 | 2,140 | 1785 | 54 | 1,960 | 1742 | 56. | 1,954 | 1869 | 46 | 785 | 1662 | 104 | 976 | 1765 | 64 | 1,605 | 2322 | 90 |
| oil_seeds | 2,895 | 75 | 9 | 2,140 | 50 | 4 | 1,960 | 111 | 14 | 1,954 | 88 | 8 | 785 | 32 | 9 | 976 | 209 | 25 | 1,605 | 267 | 27 |
| drinks | 2,895 | 1574 | 204 | 2,140 | 1296 | 81 | 1,960 | 1464 | 97 | 1,954 | 2354 | 215 | 785 | 1678 | 117 | 976 | 1402 | 132 | 1,605 | 3062 | 252 |
| spices | | | | | | | | | | | | | | | | | | | | | |
| bread | 2,895 | 3083 | 40 | 2,140 | 3445 | 74 | 1,960 | 3886 | 68 | 1,954 | 3541 | 56 | 785 | 2957 | 128 | 976 | 4191 | 118 | 1,605 | 5197 | 275 |
| coffee | 2,895 | 1069 | 101 | 2,140 | 971 | 80 | 1,960 | 1368 | 114 | 1,954 | 1485 | 157 | 785 | 131 | 42 | 976 | 1239 | 99 | 1,605 | 4707 | 256 |
| vegetable | 2,895 | 2486 | 126 | 2,140 | 2800 | 176 | 1,960 | 3215 | 145 | 1,954 | 3181 | 113 | 785 | 1709 | 450 | 976 | 3298 | 212 | 1,605 | 8256 | 266 |
| Animal bi-products | 2,895 | 1526 | 121 | 2,140 | 1454 | 94 | 1,960 | 1808 | 149 | 1,954 | 2026 | 113 | 785 | 491 | 318 | 976 | 1795 | 148 | 1,605 | 6683 | 205 |
| Social-contribution | 2,895 | 4706 | 373 | 2,140 | 5298 | 488 | 1,960 | 6128 | 508 | 1,954 | 7183 | 560 | 785 | 124 | 67 | 976 | 6983 | 849 | 1,605 | 29586 | 1221 |
| transport | 2,895 | 145 | 8 | 2,140 | 117 | 10 | 1,960 | 218 | 29 | 1,954 | 234 | 21 | 785 | 137 | 6 | 976 | 200 | 26 | 1,605 | 461 | 44 |
| Household utensils & Buildings | 2,895 | 588 | 46 | 2,140 | 630 | 122 | 1,960 | 829 | 102 | 1,954 | 653 | 84 | 785 | 266 | 20 | 976 | 1697 | 398 | 1,605 | 3707 | 1296 |
| Water- bill | 2,895 | 990 | 224 | 2,140 | 772 | 213 | 1,960 | 2180 | 684 | 1,954 | 939 | 231 | 785 | 269 | 87 | 976 | 704 | 203 | 1,605 | 4388 | 1396 |
| Clothing | 2,895 | 1102 | 49 | 2,140 | 1331 | 74 | 1,960 | 2302 | 321 | 1,954 | 1533 | 87 | 785 | 574 | 87 | 976 | 2483 | 257 | 1,605 | 4615 | 286 |
| Health_expenditures | 2,895 | 4354 | 135 | 2,140 | 4453 | 127 | 1,960 | 5113 | 135 | 1,954 | 5033 | 168 | 785 | 3962 | 115 | 976 | 5252 | 167 | 1,605 | 8277 | 289 |
| Education_expenditures | 2,895 | 236 | 21 | 2,140 | 244 | 33 | 1,960 | 402 | 50 | 1,954 | 290 | 25 | 785 | 118 | 20 | 976 | 450 | 64 | 1,605 | 1129 | 173 |
| others_ expenditures | 2,895 | 602 | 34 | 2,140 | 590 | 35 | 1,960 | 893 | 59 | 1,954 | 713 | 64 | 785 | 270 | 27 | 976 | 861 | 84 | 1,605 | 2250 | 217 |

Appendix Table **3.6.2 Mean and standard error of annual expenditures of Households for different items (in birr) by place of residence**

| | Central zone | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S.E. | Obs | Mean | S.E. |
| cereals | 2,895 | 14426 | 273 | 1,069 | 13114 | 431 | 1,826 | 15195 | 351 |
| pulses | 2,895 | 1734 | 38 | 1,069 | 1820 | 55 | 1,826 | 1684 | 51 |
| oil_seeds | 2,895 | 75 | 9 | 1,069 | 136 | 14 | 1,826 | 39 | 12 |
| drinks | 2,895 | 1574 | 204 | 1,069 | 2345 | 512 | 1,826 | 1122 | 120 |
| spices | 2,895 | 3083 | 40 | 1,069 | 3875 | 83 | 1,826 | 2619 | 38 |
| bread | 2,895 | 1069 | 101 | 1,069 | 2765 | 266 | 1,826 | 77 | 11 |
| coffee | 2,895 | 2486 | 126 | 1,069 | 5287 | 317 | 1,826 | 846 | 39 |
| vegetable | 2,895 | 1526 | 121 | 1,069 | 3909 | 313 | 1,826 | 131 | 17 |
| Animal bi-products | 2,895 | 4706 | 373 | 1,069 | 12663 | 965 | 1,826 | 48 | 5 |
| Social-contribution | 2,895 | 145 | 8 | 1,069 | 223 | 16 | 1,826 | 100 | 9 |
| transport | 2,895 | 588 | 46 | 1,069 | 986 | 116 | 1,826 | 355 | 27 |
| Household utensils & Buildings | 2,895 | 990 | 224 | 1,069 | 2228 | 589 | 1,826 | 265 | 81 |
| Water- bill | 2,895 | 1102 | 49 | 1,069 | 2439 | 116 | 1,826 | 319 | 21 |
| Clothing | 2,895 | 4354 | 135 | 1,069 | 6037 | 334 | 1,826 | 3368 | 78 |
| Health_expenditures | 2,895 | 236 | 21 | 1,069 | 465 | 51 | 1,826 | 101 | 15 |
| Education_expenditures | 2,895 | 602 | 34 | 1,069 | 1090 | 84 | 1,826 | 316 | 19 |
| others_ expenditures | 2,895 | 17 | 6 | 1,069 | 48 | 17 | 1,826 | 0.06 | 0.05 |

Appendix Table **3.6.3 Mean and standard error of annual expenditures of Households for different items (in birr) by by gender**

| | central zone | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| cereals | 2,895 | 14426 | 273 | 2,049 | 15039 | 333 | 846 | 12943 | 472 |
| pulses | 2,895 | 1734 | 38 | 2,049 | 1759 | 42 | 846 | 1675 | 80 |
| oil_seeds | 2,895 | 75 | 9 | 2,049 | 62 | 7 | 846 | 105 | 26 |
| drinks | 2,895 | 1574 | 204 | 2,049 | 1460 | 121 | 846 | 1849 | 634 |
| spices | 2,895 | 3083 | 40 | 2,049 | 3107 | 50 | 846 | 3026 | 68 |
| bread | 2,895 | 1069 | 101 | 2,049 | 975 | 82 | 846 | 1298 | 284 |
| coffee | 2,895 | 2486 | 126 | 2,049 | 2388 | 166 | 846 | 2722 | 156 |
| vegetable | 2,895 | 1526 | 121 | 2,049 | 1416 | 98 | 846 | 1794 | 338 |
| Animal-bi-product | 2,895 | 4706 | 373 | 2,049 | 4773 | 449 | 846 | 4544 | 672 |
| Social-contribution | 2,895 | 145 | 8 | 2,049 | 148 | 10 | 846 | 138 | 13 |
| transport | 2,895 | 588 | 46 | 2,049 | 558 | 41 | 846 | 661 | 124 |
| Household utensils & buildings | 2,895 | 990 | 224 | 2,049 | 1232 | 309 | 846 | 404 | 162 |
| Water-bill | 2,895 | 1102 | 49 | 2,049 | 1086 | 62 | 846 | 1140 | 71 |
| clothing | 2,895 | 4354 | 135 | 2,049 | 4502 | 157 | 846 | 3995 | 261 |
| Health_expenditure | 2,895 | 236 | 21 | 2,049 | 236 | 26 | 846 | 235 | 38 |
| Education_expenditure | 2,895 | 602 | 34 | 2,049 | 646 | 44 | 846 | 495 | 47 |
| tax_payment | 2,895 | 251 | 65 | 2,049 | 262 | 83 | 846 | 223 | 97 |
| others_expenditure | 2,895 | 17 | 6 | 2,049 | 18 | 7 | 846 | 15 | 11 |

Appendix Table **3.6.4. Mean and standard error of annual expenditures of Households for different items (in birr) by place of residence**

| | Eastern zone | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| cereals | 2,140 | 13382 | 310 | 925 | 13957 | 484 | 1,215 | 12944 | 403 |
| pulses | 2,140 | 1785 | 54 | 925 | 1863 | 64 | 1,215 | 1725 | 82 |
| oil_seeds | 2,140 | 50 | 4 | 925 | 104 | 9 | 1,215 | 10 | 2 |
| drinks | 2,140 | 1296 | 81 | 925 | 1841 | 157 | 1,215 | 881 | 76 |
| spices | 2,140 | 3445 | 74 | 925 | 3957 | 85 | 1,215 | 3055 | 112 |
| bread | 2,140 | 971 | 80 | 925 | 2158 | 178 | 1,215 | 67 | 9 |
| coffee | 2,140 | 2800 | 176 | 925 | 5003 | 389 | 1,215 | 1122 | 58 |
| vegetable | 2,140 | 1454 | 94 | 925 | 3199 | 203 | 1,215 | 125 | 6 |
| Animal-bi-product | 2,140 | 5298 | 488 | 925 | 12170 | 1088 | 1,215 | 66 | 5 |
| Social-contribution | 2,140 | 117 | 10 | 925 | 195 | 23 | 1,215 | 58 | 3 |
| Transport expenditure | 2,140 | 630 | 122 | 925 | 1068 | 280 | 1,215 | 296 | 23 |
| Household utensils & buildings | 2,140 | 772 | 213 | 925 | 1406 | 455 | 1,215 | 290 | 141 |
| Water-bill | 2,140 | 1331 | 74 | 925 | 2580 | 160 | 1,215 | 381 | 26 |
| clothing | 2,140 | 4453 | 127 | 925 | 5883 | 263 | 1,215 | 3364 | 89 |
| Health expenditure | 2,140 | 244 | 33 | 925 | 398 | 71 | 1,215 | 127 | 24 |
| Education expenditure | 2,140 | 590 | 35 | 925 | 1026 | 76 | 1,215 | 258 | 17 |
| others_expenditure | 2,140 | 13 | 6 | 925 | 26 | 13 | 1,215 | 2 | 2 |

Appendix Table **3.6.5 Mean and standard error of annual expenditures of Households for different items (in birr) by gender**

| Variable | Eastern zone | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | S.E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| cereals | 2,140 | 13382 | 310 | 1,314 | 14314 | 434 | 826 | 11899 | 405 |
| pulses | 2,140 | 1785 | 54 | 1,314 | 1950 | 81 | 826 | 1522 | 56 |
| oil_seeds | 2,140 | 50 | 4 | 1,314 | 49 | 4 | 826 | 53 | 9 |
| drinks | 2,140 | 1296 | 81 | 1,314 | 1449 | 100 | 826 | 1052 | 137 |
| spices | 2,140 | 3445 | 74 | 1,314 | 3551 | 112 | 826 | 3276 | 69 |
| bread | 2,140 | 971 | 80 | 1,314 | 980 | 116 | 826 | 956 | 95 |
| coffee | 2,140 | 2800 | 176 | 1,314 | 2928 | 265 | 826 | 2595 | 174 |
| vegetable | 2,140 | 1454 | 94 | 1,314 | 1419 | 124 | 826 | 1509 | 142 |
| Animal-bi-product | 2,140 | 5298 | 488 | 1,314 | 5456 | 678 | 826 | 5047 | 659 |
| Social-contribution | 2,140 | 117 | 10 | 1,314 | 134 | 15 | 826 | 90 | 9 |
| Transport expenditure | 2,140 | 630 | 122 | 1,314 | 719 | 193 | 826 | 487 | 69 |
| Household utensils & buildings | 2,140 | 772 | 213 | 1,314 | 855 | 283 | 826 | 640 | 319 |
| Water-bill | 2,140 | 1331 | 74 | 1,314 | 1185 | 71 | 826 | 1564 | 157 |
| Clothing | 2,140 | 4453 | 127 | 1,314 | 4720 | 174 | 826 | 4028 | 178 |
| Health expenditure | 2,140 | 244 | 33 | 1,314 | 270 | 50 | 826 | 203 | 32 |
| education | 2,140 | 590 | 35 | 1,314 | 612 | 43 | 826 | 554 | 60 |
| tax_payment | 2,140 | 122 | 19 | 1,314 | 111 | 23 | 826 | 138 | 36 |
| others_expenditure | 2,140 | 13 | 6 | 1,314 | 7 | 2 | 826 | 22 | 15 |

.

Appendix Table **3.6.6Mean and standard error of annual expenditures of Households for different items (in birr) by place of residence**

| Variable | North-west | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | S. E | Obs | Mean | S. E | Obs | Mean | S. E |
| cereals | 1,960 | 15642 | 312 | 788 | 14613 | 533 | 1,172 | 16333 | 379 |
| pulses | 1,960 | 1742 | 56. | 788 | 1996 | 106 | 1,172 | 1571 | 61 |
| oil_seeds | 1,960 | 111 | 14 | 788 | 216 | 32 | 1,172 | 40 | 10 |
| drinks | 1,960 | 1464 | 97 | 788 | 2070 | 167 | 1,172 | 1056 | 117 |
| spices | 1,960 | 3886 | 68 | 788 | 4400 | 119 | 1,172 | 3541 | 79 |
| bread | 1,960 | 1368 | 114 | 788 | 3093 | 269 | 1,172 | 209 | 31 |
| coffee | 1,960 | 3215 | 145 | 788 | 5652 | 277 | 1,172 | 1577 | 137 |
| vegetable | 1,960 | 1808 | 149 | 788 | 4222 | 355 | 1,172 | 186 | 15 |
| Animal-bi-product | 1,960 | 6128 | 508 | 788 | 14874 | 1197 | 1,172 | 247 | 33 |
| Social-contribution | 1,960 | 218 | 29 | 788 | 351 | 65 | 1,172 | 128 | 21 |
| Transport expenditure | 1,960 | 829 | 102 | 788 | 1403 | 249 | 1,172 | 443 | 25 |
| Household utensils & buildings | 1,960 | 2180 | 684 | 788 | 4809 | 1673 | 1,172 | 413 | 192 |
| Water bill | 1,960 | 2302 | 321 | 788 | 4315 | 787 | 1,172 | 949 | 76 |
| clothing | 1,960 | 5113 | 135 | 788 | 6607 | 290 | 1,172 | 4109 | 105 |
| Health expenditure | 1,960 | 402 | 50 | 788 | 516 | 54 | 1,172 | 325 | 75 |
| Education expenditure | 1,960 | 893 | 59 | 788 | 1666 | 141 | 1,172 | 374 | 22 |
| others_ expenditure | 1,960 | 32 | 14 | 788 | 48 | 24 | 1,172 | 21 | 17 |

Appendix Table **3.6.7Mean and standard error of annual expenditures of Households for different items (in birr) by gender**

| | North west | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| cereals | 1,960 | 15642 | 312 | 1,417 | 15809 | 369 | 543 | 15206 | 587 |
| pulses | 1,960 | 1742 | 56 | 1,417 | 1740 | 69 | 543 | 1746 | 95 |
| oil_seeds | 1,960 | 111 | 14 | 1,417 | 105 | 18 | 543 | 126 | 23 |
| drinks | 1,960 | 1464 | 97 | 1,417 | 1359 | 102 | 543 | 1738 | 2311 |
| spices | 1,960 | 3886 | 68 | 1,417 | 3828 | 75 | 543 | 4040 | 150 |
| bread | 1,960 | 1368 | 114 | 1,417 | 1263 | 138 | 543 | 1643 | 202 |
| coffee | 1,960 | 3215 | 145 | 1,417 | 3062 | 177 | 543 | 3616 | 248 |
| vegetable | 1,960 | 1808 | 149 | 1,417 | 1601 | 185 | 543 | 2348 | 241 |
| Animal-bi-product | 1,960 | 6128 | 508 | 1,417 | 4734 | 517 | 543 | 9764 | 1229 |
| Social-contribution | 1,960 | 218 | 29 | 1,417 | 212 | 35 | 543 | 233 | 54 |
| Transport expenditure | 1,960 | 829 | 102 | 1,417 | 651 | 38 | 543 | 1293 | 353 |
| Household utensils & buildings | 1,960 | 2180 | 684 | 1,417 | 1484 | 553 | 543 | 3996 | 2002 |
| Water bill | 1,960 | 2302 | 321 | 1,417 | 1907 | 278 | 543 | 3332 | 904 |
| clothing | 1,960 | 5113 | 135 | 1,417 | 4994 | 160 | 543 | 5424 | 252 |
| Health expenditure | 1,960 | 402 | 50 | 1,417 | 384 | 65 | 543 | 448 | 63 |
| Education expenditure | 1,960 | 893 | 59 | 1,417 | 763 | 60 | 543 | 1232 | 148 |
| tax_payment | 1,960 | 445 | 137 | 1,417 | 460 | 186 | 543 | 405 | 99 |
| others_ expenditure | 1,960 | 32 | 14 | 1,417 | 21 | 13 | 543 | 61 | 38 |

Appendix Table **3.6.8Mean and standard error of annual expenditures of Households for different items (in birr) by place of residence**

| | Southern zone | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| cereals | 1,954 | 14179 | 325 | 864 | 13273 | 574 | 1,090 | 14897 | 364 |
| pulses | 1,954 | 1869 | 46 | 864 | 1923 | 78 | 1,090 | 1826 | 54 |
| oil_seeds | 1,954 | 88 | 8 | 864 | 169 | 16 | 1,090 | 24 | 4 |
| drinks | 1,954 | 2354 | 215 | 864 | 1789 | 121 | 1,090 | 2802 | 373 |
| spices | 1,954 | 3541 | 56 | 864 | 4003 | 102 | 1,090 | 3175 | 59 |
| bread | 1,954 | 1485 | 157 | 864 | 3205 | 346 | 1,090 | 121 | 13 |
| coffee | 1,954 | 3181 | 113 | 864 | 5698 | 224 | 1,090 | 1187 | 38 |
| vegetable | 1,954 | 2026 | 113 | 864 | 4331 | 233 | 1,090 | 198 | 17 |
| Animal-bi-product | 1,954 | 7183 | 560 | 864 | 15829 | 1192 | 1,090 | 329 | 132 |
| Social-contribution | 1,954 | 234 | 21 | 864 | 324 | 44 | 1,090 | 161 | 15 |
| Transport expenditure | 1,954 | 653 | 84 | 864 | 1081 | 185 | 1,090 | 313 | 33 |
| Household utensils & buildings | 1,954 | 939 | 231 | 864 | 1154 | 405 | 1,090 | 768 | 263 |
| Water bill | 1,954 | 1533 | 87 | 864 | 2824 | 181 | 1,090 | 511 | 43 |
| Clothing | 1,954 | 5033 | 168 | 864 | 5724 | 228 | 1,090 | 4485 | 240 |
| Health expenditure | 1,954 | 290 | 25 | 864 | 423 | 46 | 1,090 | 185 | 27 |
| Education expenditure | 1,954 | 713 | 64 | 864 | 1369 | 142 | 1,090 | 192 | 15 |
| others_ expenditure | 1,954 | 69 | 22 | 864 | 123 | 44 | 1,090 | 26 | 19 |

Appendix Table **3.6.9Mean and standard error of annual expenditures of Households for different items (in birr) by gender**

| Variable | southern zone | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| cereals | 1,954 | 14179 | 325 | 1,245 | 15131 | 458 | 709 | 12506 | 386 |
| pulses | 1,954 | 1869 | 46 | 1,245 | 1915 | 56 | 709 | 1787 | 79 |
| oil_seeds | 1,954 | 88 | 8 | 1,245 | 90 | 11 | 709 | 85 | 9 |
| drinks | 1,954 | 2354 | 215 | 1,245 | 2963 | 329 | 709 | 1284 | 124 |
| spices | 1,954 | 3541 | 56 | 1,245 | 3679 | 67 | 709 | 3299 | 101 |
| bread | 1,954 | 1485 | 157 | 1,245 | 1430 | 159 | 709 | 1580 | 330 |
| coffee | 1,954 | 3181 | 113 | 1,245 | 3032 | 139 | 709 | 3443 | 194 |
| vegetable | 1,954 | 2026 | 113 | 1,245 | 2029 | 146 | 709 | 2020 | 179 |
| Animal-bi-product | 1,954 | 7183 | 560 | 1,245 | 7709 | 752 | 709 | 6259 | 798 |
| Social-contribution | 1,954 | 234 | 21 | 1,245 | 250 | 29 | 709 | 205 | 29 |
| Transport expenditure | 1,954 | 653 | 84 | 1,245 | 757 | 130 | 709 | 468 | 39 |
| Household utensils & buildings | 1,954 | 939 | 231 | 1,245 | 809 | 234 | 709 | 1167 | 489 |
| Water bill | 1,954 | 1533 | 87 | 1,245 | 1523 | 120 | 709 | 1551 | 117 |
| clothing | 1,954 | 5033 | 168 | 1,245 | 5428 | 239 | 709 | 4339 | 193 |
| Health expenditure | 1,954 | 290 | 25 | 1,245 | 299 | 32 | 709 | 275 | 41 |
| Education expenditure | 1,954 | 713 | 64 | 1,245 | 720 | 89 | 709 | 700 | 85 |
| others_ expenditure | 1,954 | 69 | 22 | 1,245 | 74 | 28 | 709 | 60 | 36 |

Appendix Table**3.6.10Mean and standard error of annual expenditures of Households for different items (in birr) by place of residence**

| Variable | South east zone | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Cereals | 785 | 14963 | 445 | 92 | 11769 | 981 | 693 | 15387 | 485 |
| Pulses | 785 | 1662 | 104 | 92 | 1530 | 223 | 693 | 1679 | 114 |
| Oil_seeds | 785 | 32 | 9 | 92 | 53 | 33 | 693 | 29 | 10 |
| Drinks | 785 | 1678 | 117 | 92 | 1659 | 3602 | 693 | 1680 | 124 |
| spices | 785 | 2957 | 128 | 92 | 2947 | 148 | 693 | 2958 | 143 |
| bread | 785 | 131 | 42 | 92 | 70 | 27 | 693 | 139 | 48 |
| coffee | 785 | 1709 | 450 | 92 | 1017 | 119 | 693 | 1801 | 509 |
| vegetable | 785 | 491 | 318 | 92 | 187 | 32 | 693 | 531 | 360 |
| Animal-bi-product | 785 | 124 | 67 | 92 | 37 | 9 | 693 | 136 | 76 |
| Social-contribution | 785 | 137 | 6 | 92 | 135 | 20 | 693 | 138 | 6 |
| Transport expenditure | 785 | 266 | 20 | 92 | 320 | 70 | 693 | 259 | 21 |
| Household utensils & buildings | 785 | 269 | 87 | 92 | 38 | 27 | 693 | 299 | 99 |
| Water bill | 785 | 574 | 87 | 92 | 1140 | 175 | 693 | 498 | 96 |
| clothing | 785 | 3962 | 115 | 92 | 4136 | 328 | 693 | 3939 | 123 |
| Health expenditure | 785 | 118 | 20 | 92 | 207 | 72 | 693 | 106 | 20 |
| Education expenditure | 785 | 270 | 27 | 92 | 295 | 75 | 693 | 267 | 29 |
| others_ expenditure | 785 | 23 | 9 | 92 | 10 | 10 | 693 | 25 | 10 |

Appendix Table **3.6.11Mean and standard error of annual expenditures of Households for different items (in birr) by gender**

| | south east zone | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. |
| Cereals | 785 | 14963 | 445 | 542 | 15692 | 570 | 243 | 13335 | 660 |
| Pulses | 785 | 1662 | 104 | 542 | 1770 | 146 | 243 | 1420 | 81 |
| Oil_seeds | 785 | 32 | 9 | 542 | 19 | 6 | 243 | 61 | 28 |
| Drinks | 785 | 1678 | 117 | 542 | 2019 | 157 | 243 | 917 | 131 |
| spices | 785 | 2957 | 128 | 542 | 2840 | 68 | 243 | 3217 | 383 |
| bread | 785 | 131 | 42 | 542 | 151 | 61 | 243 | 86 | 23 |
| coffee | 785 | 1709 | 450 | 542 | 1582 | 462 | 243 | 1992 | 1026 |
| vegetable | 785 | 491 | 318 | 542 | 626 | 461 | 243 | 189 | 17 |
| Animal-bi-product | 785 | 124 | 67 | 542 | 160 | 97 | 243 | 43 | 9 |
| Social-contribution | 785 | 137 | 6 | 542 | 133 | 7 | 243 | 146 | 12 |
| Transport expenditure | 785 | 266 | 20 | 542 | 231 | 17 | 243 | 345 | 55 |
| Household utensils & buildings | 785 | 269 | 87 | 542 | 300 | 121 | 243 | 200 | 83 |
| Water bill | 785 | 574 | 87 | 542 | 452 | 44 | 243 | 845 | 264 |
| clothing | 785 | 3962 | 115 | 542 | 4032 | 145 | 243 | 3807 | 183 |
| Health expenditure | 785 | 118 | 20 | 542 | 106 | 22 | 243 | 143 | 43 |
| Education expenditure | 785 | 270 | 27 | 542 | 243 | 33 | 243 | 331 | 48 |
| tax_payment | 785 | 37 | 4 | 542 | 34 | 4 | 243 | 43 | 8 |
| others_ expenditure | 785 | 23 | 9 | 542 | 215 | 11 | 243 | 26 | 16 |

Appendix Table **3.6.12Mean and standard error of annual expenditures of Households for different items (in birr) by place of residence**

| Variable | western zone | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Cereals | 976 | 13699 | 521 | 514 | 14323 | 788 | 462 | 13004 | 665 |
| Pulses | 976 | 1765 | 64 | 514 | 1881 | 89 | 462 | 1635 | 94 |
| Oil_seeds | 976 | 209 | 25 | 514 | 208 | 33 | 462 | 211 | 39 |
| Drinks | 976 | 1402 | 132 | 514 | 1873 | 227 | 462 | 878 | 113 |
| spices | 976 | 4191 | 118 | 514 | 4595 | 183 | 462 | 3743 | 143 |
| bread | 976 | 1239 | 99 | 514 | 2082 | 176 | 462 | 301 | 41 |
| coffee | 976 | 3298 | 212 | 514 | 4627 | 307 | 462 | 1819 | 273 |
| vegetable | 976 | 1795 | 148 | 514 | 3268 | 264 | 462 | 157 | 15 |
| Animal-bi-product | 976 | 6983 | 849 | 514 | 13126 | 1564 | 462 | 148 | 20 |
| Social-contribution | 976 | 200 | 26 | 514 | 285 | 49 | 462 | 105 | 11 |
| Transport expenditure | 976 | 1697 | 398 | 514 | 1965 | 606 | 462 | 1398 | 503 |
| Household utensils & buildings | 976 | 704 | 203 | 514 | 1080 | 371 | 462 | 287 | 119 |
| Water bill | 976 | 2483 | 257 | 514 | 3618 | 466 | 462 | 1220 | 143 |
| clothing | 976 | 5252 | 167 | 514 | 5988 | 237 | 462 | 4434 | 228 |
| Health expenditure | 976 | 450 | 64 | 514 | 536 | 105 | 462 | 355 | 70 |
| Education expenditure | 976 | 861 | 84 | 514 | 1280 | 152 | 462 | 396 | 50 |
| tax_payment | 976 | 286 | 71 | 514 | 283 | 50 | 462 | 289 | 140 |
| others_ expenditure | 976 | 69 | 26 | 514 | 129 | 50 | 462 | 2 | 2 |

Appendix Table **3.6.13Mean and standard error of annual expenditures of Households for different items (in birr) by gender**

| Variable | western zone | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S.E. |
| Cereals | 976 | 13699 | 521 | 723 | 13846 | 671 | 253 | 13278 | 602 |
| Pulses | 976 | 1765 | 64 | 723 | 1677 | 75 | 253 | 2015 | 128 |
| Oil_seeds | 976 | 209 | 25 | 723 | 180 | 22 | 253 | 292 | 73 |
| Drinks | 976 | 1402 | 132 | 723 | 1342 | 125 | 253 | 1572 | 364 |
| spices | 976 | 4191 | 118 | 723 | 4195 | 148 | 253 | 4182 | 171 |
| bread | 976 | 1239 | 99 | 723 | 1091 | 110 | 253 | 1661 | 216 |
| coffee | 976 | 3298 | 212 | 723 | 3058 | 243 | 253 | 3982 | 428 |
| vegetable | 976 | 1795 | 148 | 723 | 1429 | 147 | 253 | 2841 | 380 |
| Animal-bi-product | 976 | 6983 | 849 | 723 | 6280 | 995 | 253 | 8993 | 1622 |
| Social-contribution | 976 | 200 | 26 | 723 | 195 | 34 | 253 | 213 | 31 |
| Transport expenditure | 976 | 1697 | 398 | 723 | 1103 | 359 | 253 | 3392 | 1140 |
| Household utensils & buildings | 976 | 704 | 203 | 723 | 564 | 194 | 253 | 1105 | 557 |
| Water bill | 976 | 2483 | 257 | 723 | 2273 | 324 | 253 | 3081 | 352 |
| clothing | 976 | 5252 | 167 | 723 | 4955 | 170 | 253 | 6100 | 417 |
| Health expenditure | 976 | 450 | 64 | 723 | 420 | 57 | 253 | 536 | 187 |
| Education expenditure | 976 | 861 | 84 | 723 | 814 | 100 | 253 | 998 | 156 |
| tax_payment | 976 | 286 | 71 | 723 | 245 | 64 | 253 | 404 | 205 |
| others_ expenditure | 976 | 69 | 26 | 723 | 63 | 28 | 253 | 86 | 62 |

Appendix Table **3.6.14Mean and standard error of annual expenditures of Households for different items (in birr) by place of residence**

| Variable | mekelle zone | | | Urban | | |
|---|---|---|---|---|---|---|
| | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Cereals | 1,605 | 14948 | 358 | 1,605 | 14948 | 358 |
| Pulses | 1,605 | 2322 | 90 | 1,605 | 2322 | 90 |
| Oil_seeds | 1,605 | 267 | 27 | 1,605 | 267 | 27 |
| Drinks | 1,605 | 3062 | 252 | 1,605 | 3062 | 252 |
| spices | 1,605 | 5197 | 275 | 1,605 | 5197 | 275 |
| bread | 1,605 | 4707 | 256 | 1,605 | 4707 | 256 |
| coffee | 1,605 | 8256 | 266 | 1,605 | 8256 | 266 |
| vegetable | 1,605 | 6683 | 205 | 1,605 | 6683 | 205 |
| Animal-bi-product | 1,605 | 29586 | 1221 | 1,605 | 29586 | 1221 |
| Social-contribution | 1,605 | 461 | 44 | 1,605 | 461 | 44 |
| Transport expenditure | 1,605 | 3707 | 1296 | 1,605 | 3707 | 1296 |
| Household utensils & buildings | 1,605 | 4388 | 1396 | 1,605 | 4388 | 1396 |
| Water bill | 1,605 | 4615 | 286 | 1,605 | 4615 | 286 |
| clothing | 1,605 | 8277 | 289 | 1,605 | 8277 | 289 |
| Health expenditure | 1,605 | 1129 | 173 | 1,605 | 1129 | 173 |
| Education expenditure | 1,605 | 2250 | 217 | 1,605 | 2250 | 217 |
| others_ expenditure | 1,605 | 170 | 113 | 1,605 | 170 | 113 |

Appendix Table **3.6.15Mean and standard error of annual expenditures of Households for different items (in birr) by gender**

| Variable | mekelle zone | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Cereals | 1,605 | 14948 | 358 | 893 | 16548 | 445 | 712 | 12940 | 576 |
| Pulses | 1,605 | 2322 | 90 | 893 | 2453 | 94 | 712 | 2159 | 164 |
| Oil_seeds | 1,605 | 267 | 27 | 893 | 290 | 22 | 712 | 238 | 56 |
| Drinks | 1,605 | 3062 | 252 | 893 | 3799 | 427 | 712 | 2138 | 187 |
| spices | 1,605 | 5197 | 275 | 893 | 5283 | 117 | 712 | 5090 | 604 |
| bread | 1,605 | 4707 | 256 | 893 | 5655 | 386 | 712 | 3518 | 308 |
| coffee | 1,605 | 8256 | 266 | 893 | 9085 | 422 | 712 | 7216 | 278 |
| vegetable | 1,605 | 6683 | 205 | 893 | 7474 | 296 | 712 | 5692 | 273 |
| Animal-bi-product | 1,605 | 29586 | 1221 | 893 | 33578 | 1690 | 712 | 24579 | 1739 |
| Social-contribution | 1,605 | 461 | 44 | 893 | 499 | 53 | 712 | 413 | 74 |
| Transport expenditure | 1,605 | 3707 | 1296 | 893 | 5084 | 2287 | 712 | 1981 | 558 |
| Household utensils & buildings | 1,605 | 4388 | 1396 | 893 | 6523 | 2467 | 712 | 1710 | 567 |
| Water bill | 1,605 | 4615 | 286 | 893 | 5418 | 451 | 712 | 3608 | 308 |
| clothing | 1,605 | 8277 | 289 | 893 | 9601 | 456 | 712 | 6616 | 302 |
| Health expenditure | 1,605 | 1129 | 173 | 893 | 1498 | 287 | 712 | 667 | 149 |
| Education expenditure | 1,605 | 2250 | 217 | 893 | 2660 | 369 | 712 | 1737 | 160 |
| tax_payment | 1,605 | 966 | 307 | 893 | 1353 | 544 | 712 | 480 | 121 |
| others_ expenditure | 1,605 | 170 | 113 | 893 | 264 | 202 | 712 | 51 | 25 |

Appendix Table **3.6.16per adult Consumption expenditure by place of residence**

| | Central zone | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Per adult food consumption | 2,838 | 8319 | 156 | 1,069 | 10778 | 353 | 1,776 | 6963 | 121 |
| Per adult non-food consumption | 2,861 | 3108 | 105 | 1,057 | 4304 | 245 | 1,804 | 2407 | 80 |
| Per adult total consumption | 2,881 | 11,352 | 209 | 1,067 | 14992 | 477 | 1,814 | 9211 | 159 |

Appendix Table **3.6.17 per adult Consumption expenditure by gender**

| | Central zone | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Per adult food consumption | 2,838 | 8319 | 156 | 2,007 | 9024 | 181 | 831 | 6861 | 298 |
| Per adult non-food consumption | 2,861 | 3108 | 105 | 2,032 | 3376 | 120 | 829 | 2451 | 212 |
| Per adult total consumption | 2,881 | 11,352 | 209 | 2,040 | 12,241 | 242 | 841 | 9197 | 404 |

Appendix Table **3.6.18 Per adult Consumption expenditure by place of residence**

| | Eastern zone | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Per adult food consumption | 2,092 | 8286 | 193 | 903 | 10,608 | 392 | 1,186 | 6518 | 143 |
| Per adult non-food consumption | 2,092 | 3,171 | 109 | 891 | 4201 | 242 | 1,201 | 2406 | 55 |
| Per adult total consumption | 2,130 | 11,219 | 242 | 918 | 14,468 | 490 | 1,212 | 8759 | 176 |

Appendix Table **3.6.19 Per adult Consumption expenditure by gender**

| | Eastern zone | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Per adult food consumption | 2,092 | 8286 | 193 | 1,279 | 9,085 | 276 | 810 | 7,025 | 234 |
| Per adult non-food consumption | 2,092 | 3,171 | 109 | 1,288 | 3614 | 153 | 804 | 2,461 | 140 |
| Per adult total consumption | 2,130 | 11,219 | 242 | 1,308 | 12,407 | 340 | 822 | 9,329 | 304 |

Appendix Table **3.6.20 Per adult Consumption expenditure by place of residence**

| | North west zone | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Per adult food consumption | 1,954 | 9,936 | 262 | 786 | 13,171 | 603 | 1,168 | 7720 | 134 |
| Per adult non-food consumption | 1,934 | 4,101 | 149 | 767 | 5,059 | 323 | 1,167 | 3471 | 125 |
| Per adult total consumption | 1,957 | 13,972 | 327 | 786 | 18,104 | 732 | 1,171 | 11,200 | 202 |

Appendix Table **3. 6.21 Per adult Consumption expenditure** by **gender**

| | North west zone | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Per adult food consumption | 1,954 | 9,936 | 262 | 1,412 | 10,277 | 322 | 542 | 9,047 | 435 |
| Per adult non-food consumption | 1,934 | 4,101 | 149 | 1,401 | 4,243 | 163 | 533 | 3,727 | 331 |
| Per adult total consumption | 1,957 | 13,972 | 327 | 1,415 | 14,455 | 384 | 542 | 12,712 | 618 |

Appendix Table **3.6.22 Per adult Consumption expenditure by place of residence**

| | Southern zone | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Per adult food consumption | 1,951 | 8939 | 183 | 861 | 10448 | 332 | 1,090 | 7747 | 189 |
| Per adult non-food consumption | 1,930 | 3,707 | 176 | 857 | 4,479 | 320 | 1,073 | 3,090 | 184 |
| Per adult total consumption | 1,952 | 12,592 | 278 | 863 | 14,862 | 512 | 1,089 | 10,793 | 279 |

Appendix Table **3.6.23 Per adult Consumption expenditure** by **gender**

| | Southern zone | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Per adult food consumption | 1,951 | 8939 | 183 | 1,242 | 9768 | 218 | 709 | 7486 | 320 |
| Per adult non-food consumption | 1,930 | 3,707 | 176 | 1,236 | 4,355 | 252 | 694 | 2553 | 186 |
| Per adult total consumption | 1,952 | 12,592 | 278 | 1,243 | 14,079 | 369 | 709 | 9986 | 391 |

Appendix Table **3.6.24 Per adult Consumption expenditure** by **place of residence**

| | South east zone | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Per adult food consumption | 782 | 7,263 | 163 | 92 | 7301 | 602 | 690 | 7,258 | 167 |
| Per adult non-food consumption | 777 | 2790 | 76 | 90 | 3147 | 220 | 687 | 2,744 | 81 |
| Per adult total consumption | 782 | 10,024 | 202 | 92 | 10384 | 669 | 690 | 9,976 | 211 |

Appendix Table **3.6.25 Per adult Consumption expenditure** by **gender**

| | South east zone | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Per adult food consumption | 782 | 7,263 | 163 | 539 | 8,070 | 196 | 243 | 5,473 | 262 |
| Per adult non-food consumption | 777 | 2,790 | 76 | 539 | 3,145 | 95 | 238 | 1,987 | 110 |
| Per adult total consumption | 782 | 10,024 | 202 | 539 | 11,197 | 241 | 243 | 7,420 | 309 |

Appendix Table **3.6.26 Per adult Consumption expenditure** by **place of residence**

| | Western zone | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Per adult food consumption | 967 | 9,233 | 299 | 507 | 11,251 | 514 | 460 | 7,010 | 233 |
| Per adult non-food consumption | 970 | 5,755 | 309 | 509 | 6,928 | 515 | 461 | 4,461 | 307 |
| Per adult total consumption | 969 | 14,872 | 479 | 509 | 18,078 | 810 | 460 | 11,324 | 404 |

Appendix Table **3.6.27 Per adult Consumption expenditure** by **gender**

| | Western zone | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S. E | Obs | Mean | S. E. |
| Per adult food consumption | 967 | 9,233 | 299 | 716 | 9,216 | 295 | 251 | 9,283 | 789 |
| Per adult non-food consumption | 970 | 5,755 | 309 | 719 | 6,445 | 407 | 251 | 3,779 | 226 |
| Per adult total consumption | 969 | 14,872 | 479 | 716 | 15,547 | 566 | 253 | 12,959 | 886 |

Appendix Table **3.6.28 Per adult Consumption expenditure** by **place of residence**

| | Mekelle zone | | | Urban | | |
|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Per adult food consumption | 1,592 | 16,700 | 456 | 1,592 | 16,700 | 456 |
| Per adult non-food consumption | 1,586 | 6,797 | 302 | 1,586 | 6,797 | 302 |
| Per adult total consumption | 1,597 | 23,321 | 609 | 1,597 | 23,321 | 609 |

Appendix Table **3.6.29 Per adult Consumption expenditure** by **gender**

| | Mekelle zone | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Per adult food consumption | 1,592 | 16,700 | 456 | 885 | 18,608 | 596 | 707 | 14,311 | 697 |
| Per adult non-food consumption | 1,586 | 6,797 | 302 | 886 | 8,507 | 500 | 700 | 4,632 | 237 |
| Per adult total consumption | 1,597 | 23,321 | 609 | 888 | 26,896 | 873 | 709 | 18,843 | 797 |

Appendix Table **3.6.30 Selected household wealth indicators** by **place of residence**

| | Central zone | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Land holding (ha) | 2,894 | 0.65 | 0.22 | 1,069 | 0.33 | 0.10 | 1,825 | 0.84 | 0.34 |
| Total asset holding of the household (birr) | 2,895 | 133727 | 12615 | 1,069 | 358333 | 33054 | 1,826 | 2235 | 384 |
| Tropical livestock unit | 2,895 | 1.46 | 0.04 | 1,069 | 0.37 | 0.05 | 1,826 | 2.10 | 0.06 |

Appendix Table **3.6.31 Selected household wealth indicators** by **gender**

| | Central zone | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Land holding (ha) | 2,894 | 0.65 | 0.22 | 2,049 | 0.77 | 0.31 | 845 | 0.36 | 0.02 |
| Total asset holding of the household (birr) | 2,895 | 133727 | 12615 | 2,049 | 126226 | 15296 | 846 | 151894 | 22161 |
| Tropical livestock unit | 2,895 | 1.46 | 0.02 | 2,049 | 1.87 | 0.06 | 846 | 0.47 | 0.04 |

Appendix Table **3.6.32 Selected household wealth indicators** by **place of residence**

| | Eastern zone | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| landsize | 2,140 | 0.41 | 0.02 | 925 | 0.34 | 0.03 | 1,215 | 0.45 | 0.02 |
| asset | 2,139 | 106477 | 13245 | 925 | 243395 | 30044 | 1,214 | 2152 | 464 |
| tlu | 2,140 | 1.13 | 0.04 | 925 | 0.41 | 0.04 | 1,215 | 1.68 | 0.06 |

Appendix Table **3.6.33 Selected household wealth indicators** by **gender**

| | Eastern zone | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Land holding (ha) | 2,140 | 0.41 | 0.02 | 1,314 | 0.39 | 0.02 | 826 | 0.43 | 0.05 |
| Total asset holding of the household (birr) | 2,139 | 106477 | 13245 | 1,313 | 83619 | 14750 | 826 | 142811 | 24995 |
| Tropical livestock unit | 2,140 | 1.13 | 0.04 | 1,314 | 1.54 | 0.06 | 826 | 0.47 | 0.04 |

Appendix Table **3.6.34 Selected household wealth indicators** by **place of residence**

| | Northwest zone | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Land holding (ha) | 1,960 | 0.69 | 0.32 | 788 | 0.26 | 0.04 | 1,172 | 0.98 | 0.53 |
| Total asset holding of the household (birr) | 1,960 | 125315 | 11894 | 788 | 308210 | 28358 | 1,172 | 2344 | 537 |
| Tropical livestock unit | 1,960 | 3.08 | 0.18 | 788 | 2.04 | 0.41 | 1,172 | 3.77 | 0.11 |

Appendix Table **3.6.35 Selected household wealth indicators** by **gender**

| | Northwest zone | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Land holding (ha) | 1,960 | 0.69 | 0.32 | 1,417 | 0.83 | 0.45 | 543 | 0.33 | 0.02 |
| Total asset holding of the household (birr) | 1,960 | 125315 | 11894 | 1,417 | 109039 | 12244 | 543 | 167787 | 28618 |
| Tropical livestock unit | 1,960 | 3.07 | 0.18 | 1,417 | 3.62 | 0.12 | 543 | 1.66 | 0.57 |

Appendix Table **3.6.36 Selected household wealth indicators** by **place of residence**

| | Southern zone | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Land holding (ha) | 1,954 | 0.83 | 0.364 | 864 | 0.19 | 0.03 | 1,090 | 1.34 | 0.64 |
| Total asset holding of the household (birr) | 1,954 | 219832 | 21220 | 864 | 494424 | 46343 | 1,090 | 2174 | 457 |
| Tropical livestock unit | 1,954 | 1.59 | 0.06 | 864 | 0.46 | 0.05 | 1,090 | 2.49 | 0.08 |

Appendix Table **3.6.37 Selected household wealth indicators by gender**

| | Southern zone | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. | Obs | Mean | Std. Err. |
| Land holding (ha) | 1,954 | 0.83 | 0.36 | 1,245 | 0.63 | 0.25 | 709 | 1.19 | 0.9 |
| Total asset holding of the household (birr) | 1,954 | 219832 | 21220 | 1,245 | 200379 | 25867 | 709 | 253992 | 36827 |
| Tropical livestock unit | 1,954 | 1.59 | 0.06 | 1,245 | 2.23 | 0.08 | 709 | 0.47 | 0.04 |

Appendix Table **3.6.38 Selected household wealth indicators** by **place of residence**

| | South East | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E | Obs | Mean | S. E | Obs | Mean | S. E. |
| Land holding (ha) | 785 | 1.27 | 0.80 | 92 | 0.42 | 0.05 | 693 | 1.38 | 0.90 |
| Total asset holding of the household (birr) | 785 | 2467 | 649 | 92 | 5492 | 3323 | 693 | 2065 | 588 |
| Tropical livestock unit | 785 | 1.8 | 0.08 | 92 | 1.16 | 0.19 | 693 | 1.9 | 0.08 |

Appendix Table **3.6.39 Selected household wealth indicators** by **gender**

| | South East | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Land holding (ha) | 785 | 1.27 | 0.78 | 542 | 1.63 | 1.15 | 243 | 0.47 | 0.06 |
| Total asset holding of the household (birr) | 785 | 2467 | 649 | 542 | 2730 | 819 | 243 | 1880 | 1030 |
| Tropical livestock unit | 785 | 1.80 | 0.07 | 542 | 2.37 | 0.09 | 243 | 0.55 | 0.08 |

Appendix Table **3.6.40 Selected household wealth indicators** by **place of residence**

| | Western | | | Urban | | | Rural | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Land holding (ha) | 976 | 0.38 | 0.02 | 514 | 0.30 | 0.03 | 462 | 0.47 | 0.02 |
| Total asset holding of the household (birr) | 976 | 139757 | 22343 | 514 | 260996 | 41710 | 462 | 4872 | 1313 |
| Tropical livestock unit | 976 | 2.99 | 0.17 | 514 | 1.95 | 0.21 | 462 | 4.16 | 0.26 |

Appendix Table **3.6.41 Selected household wealth indicators** by **gender**

| | Western | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Land holding (ha) | 976 | 0.38 | 0.02 | 723 | 0.40 | 0.02 | 253 | 0.32 | 0.03 |
| Total asset holding of the household (birr) | 976 | 139757 | 22343 | 723 | 81379 | 13403 | 253 | 306584 | 76363 |
| Tropical livestock unit | 976 | 2.99 | 0.17 | 723 | 3.75 | 0.21 | 253 | 0.83 | 0.15 |

Appendix Table **3.6.42 Selected household wealth indicators** by **place of residence**

| | Mekelle | | | Urban | | |
|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Land holding (ha) | 1,605 | 0.32 | 0.16 | 1,605 | 0.33 | 0.16 |
| Total asset holding of the household (birr) | 1,605 | 508189 | 28457 | 1,605 | 508189 | 28457 |
| Tropical livestock unit | 1,605 | 0.27 | 0.03 | 1,605 | 0.27 | 0.03 |

Appendix Table **3.6.43 Selected household wealth indicators** by **gender**

| | Mekelle | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | S. E. | Obs | Mean | S. E. | Obs | Mean | S. E. |
| Land holding (ha) | 1,605 | 0.32 | 0.16 | 893 | 0.195 | 0.05 | 712 | 0.50 | 0.35 |
| Total asset holding of the household (birr) | 1,605 | 508189 | 28457 | 893 | 514784 | 40840 | 712 | 499917 | 38647 |
| Tropical livestock unit | 1,605 | 0.27 | 0.03 | 893 | 0.31 | 0.05 | 712 | 0.23 | 0.04 |

Appendix Table **3.6.44 Poverty indices (using per adult food poverty line Birr 3792) by place of residence and gender**

| | Food poverty | | | | |
|---|---|---|---|---|---|
| Indicator | Central zone | Urban | Rural | Male | Female |
| Headcount ratio - FGT(0) | 17.38 | 12.05 | 20.58 | 13.18 | 26.68 |
| Poverty Gap - FGT(1) | 4.88 | 3.53 | 5.69 | 3.45 | 8.38 |
| Poverty Severity - FGT(2) | 2.04 | 1.52 | 2.35 | 1.338 | 3.77 |

Appendix Table **3.6.45 Poverty indices (using per adult food poverty line Birr 3792) by place of residence and gender**

| | Food poverty | | | | |
|---|---|---|---|---|---|
| Indicator | Eastern zone | Urban | Rural | Male | Female |
| Headcount ratio - FGT(0) | 19.05 | 12.17 | 24.28 | 13.44 | 27.93 |
| Poverty Gap - FGT(1) | 5.47 | 3.77 | 6.77 | 3.325 | 8.876 |
| Poverty Severity - FGT(2) | 2.29 | 1.63 | 2.80 | 1.284 | 3.89 |

Appendix Table **3.6.46 Poverty indices (using per adult food poverty line Birr 3792) by place of residence and gender**

| | Food poverty | | | | |
|---|---|---|---|---|---|
| Indicator | Northwest zone | Urban | Rural | Male | Female |
| Headcount ratio - FGT(0) | 13.63 | 10.57 | 15.70 | 9.188 | 25.185 |
| Poverty Gap - FGT(1) | 3.79 | 2.92 | 4.37 | 2.22 | 7.86 |
| Poverty Severity - FGT(2) | 1.59 | 1.23 | 1.83 | 0.837 | 3.548 |

Appendix Table **3.6.47 Poverty indices (using per adult food poverty line Birr 3792) by place of residence and gender**

| | Food poverty | | | | |
|---|---|---|---|---|---|
| Indicator | Southern | Urban | Rural | Male | Female |
| Headcount ratio - FGT(0) | 14.21 | 13.28 | 14.94 | 7.948 | 25.214 |
| Poverty Gap - FGT(1) | 3.82 | 3.67 | 3.94 | 2.001 | 7.018 |
| Poverty Severity - FGT(2) | 1.51 | 1.51 | 1.50 | 0.752 | 2.829 |

Appendix Table **3.6.48 Poverty indices (using per adult food poverty line Birr 3792) by place of residence and gender**

| | Food poverty | | | | |
|---|---|---|---|---|---|
| Indicator | South east | Urban | Rural | Male | Female |
| Headcount ratio - FGT(0) | 19.05 | 17.58 | 19.25 | 11.46 | 36.100 |
| Poverty Gap - FGT(1) | 4.40 | 3.27 | 4.55 | 2.429 | 8.815 |
| Poverty Severity - FGT(2) | 1.65 | 1.03 | 1.73 | 0.875 | 3.387 |

Appendix Table **3.6.49 Poverty indices (using per adult food poverty line Birr 3792) by place of residence and gender**

| | Food poverty | | | | |
|---|---|---|---|---|---|
| Indicator | Western | Urban | Rural | Male | Female |
| Headcount ratio - FGT(0) | 17.70 | 13.92 | 21.93 | 13.808 | 28.916 |
| Poverty Gap - FGT(1) | 4.94 | 4.25 | 5.71 | 3.778 | 8.28 |
| Poverty Severity - FGT(2) | 2.10 | 1.92 | 2.30 | 1.552 | 3.665 |

Appendix Table **3.6.50 Poverty indices (using per adult food poverty line Birr 3792) by place of residence and gender**

| | Food poverty | | | | |
|---|---|---|---|---|---|
| Indicator | Mekelle | Urban | Rural | Male | Female |
| Headcount ratio - FGT(0) | 5.68 | 5.68 | | 2.386 | 9.801 |
| Poverty Gap - FGT(1) | 1.41 | 1.41 | | 0.552 | 2.489 |
| Poverty Severity - FGT(2) | 0.56 | 0.56 | | 0.221 | 0.989 |

Appendix Table **3.6.51 Poverty indices (using per adult absolute poverty line Birr 7292) by place of residence and gender**

| | Absolute Poverty | | | | |
|---|---|---|---|---|---|
| Indicator | Central zone | Urban | Rural | Male | Female |
| Headcount ratio - FGT(0) | 35.99 | 25.87 | 42.01 | 29.225 | 52.485 |
| Poverty Gap - FGT(1) | 11.51 | 8.33 | 13.40 | 8.25 | 19.447 |
| Poverty Severity - FGT(2) | 5.34 | 3.85 | 6.22 | 3.521 | 9.767 |

Appendix Table **3.6.52 Poverty indices (using per adult absolute poverty line Birr 7292) by place of residence and gender**

| | Absolute Poverty | | | | |
|---|---|---|---|---|---|
| Indicator | Eastern zone | Urban | Rural | Male | Female |
| Headcount ratio - FGT(0) | 37.24 | 27.44 | 44.72 | 28.350 | 51.351 |
| Poverty Gap - FGT(1) | 12.23 | 8.83 | 14.82 | 8.052 | 18.853 |
| Poverty Severity - FGT(2) | 5.89 | 4.35 | 7.06 | 3.526 | 9.631 |

Appendix Table **3.6.53 Poverty indices (using per adult absolute poverty line Birr 7292) by place of residence and gender**

| | Absolute Poverty | | | | |
|---|---|---|---|---|---|
| Indicator | Northwest zone | Urban | Rural | Male | Female |
| Headcount ratio - FGT(0) | 25.36 | 20.30 | 28.77 | 19.816 | 39.779 |
| Poverty Gap - FGT(1) | 7.52 | 6.01 | 8.54 | 4.966 | 14.168 |
| Poverty Severity - FGT(2) | 3.42 | 2.80 | 3.83 | 1.986 | 7.145 |

Appendix Table **3.6.54 Poverty indices (using per adult absolute poverty line Birr 7292) by place of residence and gender**

| | Absolute Poverty | | | | |
|---|---|---|---|---|---|
| Indicator | Southern | Urban | Rural | Male | Female |
| Headcount ratio - FGT(0) | 30.39 | 27.04 | 33.03 | 20.565 | 47.66 |
| Poverty Gap - FGT(1) | 9.34 | 8.35 | 10.12 | 5.374 | 16.311 |
| Poverty Severity - FGT(2) | 4.13 | 3.73 | 4.45 | 2.163 | 7.591 |

Appendix Table **3.6.55 Poverty indices (using per adult absolute poverty line Birr 7292) by place of residence and gender**

| | Absolute Poverty | | | | |
|---|---|---|---|---|---|
| Indicator | South east | Urban | Rural | Male | Female |
| Headcount ratio - FGT(0) | 33.55 | 34.78 | 33.38 | 22.736 | 57.613 |
| Poverty Gap - FGT(1) | 10.35 | 9.40 | 10.47 | 5.482 | 21.177 |
| Poverty Severity - FGT(2) | 4.58 | 3.71 | 4.69 | 2.044 | 10.213 |

Appendix Table **3.6.56 Poverty indices (using per adult absolute poverty line Birr 7292) by place of residence and gender**

| | Absolute Poverty | | | | |
|---|---|---|---|---|---|
| Indicator | Western | Urban | Rural | Male | Female |
| Headcount ratio - FGT(0) | 26.18 | 19.49 | 33.62 | 22.022 | 38.095 |
| Poverty Gap - FGT(1) | 8.29 | 6.43 | 10.36 | 6.183 | 14.314 |
| Poverty Severity - FGT(2) | 3.83 | 3.06 | 4.69 | 2.619 | 7.300 |

Appendix Table **3.6.57 Poverty indices (using per adult absolute poverty line Birr 7292) by place of residence and gender**

| | Absolute Poverty | | | | |
|---|---|---|---|---|---|
| Indicator | Mekelle | Urban | Rural | Male | Female |
| Headcount ratio - FGT(0) | 12.81 | 12.81 | | 6.846 | 20.31 |
| Poverty Gap - FGT(1) | 4.09 | 4.09 | | 2.203 | 6.457 |
| Poverty Severity - FGT(2) | 1.83 | 1.83 | | 1.015 | 2.856 |

Appendix Table **3.6.58 Per capita adult food consumption quintiles by zone**

| | Per capita adult quintiles from lowest (1) to highest (5) | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | Total |
| Central zone | 5002 | 6867 | 8643 | 9931 | 15299 | 8476 |
| Eastern zone | 5180 | 6725 | 7683 | 9738 | 14817 | 8345 |
| Northwest zone | 6586 | 7242 | 9080 | 11685 | 13928 | 9994 |
| Southern | 5437 | 7478 | 8213 | 10295 | 14648 | 9008 |
| South east | 4745 | 7042 | 6994 | 8414 | 10158 | 7288 |
| Western | 4947 | 7420 | 8453 | 9010 | 12429 | 9286 |
| Mekelle | 7969 | 9840 | 12035 | 16410 | 24168 | 16812 |

**Table Table 3.6 59Kcal of Selected food items per 100g**

Kcal of Selected food items per 100g

| Group | Item | kcal/100g |
|---|---|---|
| Cereals and Seeds | Barley | 337 |
| | Teff | 367 |
| | Wheat | 371 |
| | Maiz | 372 |
| | Millet | 341 |
| | Rice | 353 |
| | Sorghum | 342 |
| | Chick Peas | 357 |
| | Cow Pea | 338 |
| | Ground Bean | 348 |
| | Horse Grain | 333 |
| | Lentils | 345 |
| | Peas (garden, field) | 339 |
| | Linseed | 498 |
| | Nigerseed (Nug) | 483 |
| | Sesame | 558 |
| | Sunflower | 486 |
| Vegetables | | |
| | Cabbage | 26 |
| | Carrot | 40 |
| | Cauliflower | 25 |
| | Egg Plant | 40 |
| | Lettuce | 44 |
| | Garlic | 131 |

| | | |
|---|---|---|
| | Onion (garden) | 41 |
| | Pepper (hot) | 42 |
| | Pepper (sweet) | 48 |
| | Pumpkin | 23 |
| | Tomato | 21 |
| | Potato | 94 |
| Fruits | | |
| | Apple | 58 |
| | Grapefruit | 34 |
| | Lemon | 29 |
| | Mango | 60 |
| | Orange, Mandarine | 49 |
| | Papaya | 32 |
| | Pineapple | 47 |
| | Strawberry | 37 |
| | Banana | |
| | Watermelon | 22 |
| Honey Sugar | | |
| | Honey | 311 |
| | Sugar | 344 |
| Animal Products and Oil | | |
| | Beef (medium Fat) | 237 |
| | Beef (Fat) | 410 |
| | Chicken | 146 |
| | Duck | 287 |
| | Cow milk | 685 |
| | Butter | 875 |
| | Oil (Palm) | 875 |

**Appendix Table 3.6.60 Monthly intake based on 2200 kcal/day**

| Qty | Unit | Conv to 100g | Kcal/month |
|---|---|---|---|
| 0.5 | kg | 5 | 1685 |
| 6 | kg | 60 | 22020 |
| 5 | kg | 50 | 18550 |
| 3 | kg | 30 | 11160 |
| 0 | | 0 | 0 |
| 0.15 | kg | 1.5 | 529.5 |
| 1.5 | kg | 15 | 5130 |
| 0 | | 0 | 0 |
| 0 | | 0 | 0 |
| 0 | | 0 | 0 |
| 0 | | 0 | 0 |
| 0.2 | kg | 2 | 690 |
| 0.8 | kg | 8 | 2712 |
| | | 0 | 0 |
| | | 0 | 0 |
| | | 0 | 0 |
| | | 0 | 0 |
| | | 0 | 0 |
| | | 0 | 0 |
| | | 0 | 0 |

| | | | |
|---|---|---|---|
| | | 0 | 0 |
| | | 0 | 0 |
| 0.2 | kg | 2 | 88 |
| | | 0 | 0 |
| 0.5 | kg | 5 | 205 |
| 0.1 | kg | 1 | 42 |
| | | 0 | 0 |
| | | 0 | 0 |
| 0.6 | kg | 6 | 126 |
| 0.5 | kg | 5 | 470 |
| | | 0 | 0 |
| | | 0 | 0 |
| | | 0 | 0 |
| | | 0 | 0 |
| | | 0 | 0 |
| 0.25 | kg | 2.5 | 122.5 |
| | | 0 | 0 |
| | | 0 | 0 |
| | | 0 | 0 |
| 0.25 | kg | 2.5 | 0 |
| | | 0 | 0 |
| | | 0 | 0 |
| | | 0 | 0 |
| 0.15 | | 1.5 | 516 |
| | | 0 | 0 |
| | | 0 | 0 |
| 0.1 | | 1 | 237 |
| | | 0 | 0 |

| | | | |
|---|---|---|---|
| | | 0 | 0 |
| 0.1 | | 1 | 685 |
| | | 0 | 0 |
| 0.12 | | 1.2 | 1050 |
| Total Monthly Calorie Intake | | | 66018 |

**Appendix Table 3.6.61 Cost of Food items per KG**

| p/kg | Cost |
|---|---|
| 8.5 | 4.25 |
| 22.8 | 136.8 |
| 11 | 55 |
| 8.19 | 24.57 |
| | 0 |
| 23.16 | 3.474 |
| 9.2 | 13.8 |
| | 0 |
| | 0 |
| | 0 |
| | 0 |
| 27.88 | 5.576 |
| 21.83 | 17.464 |
| | 0 |
| | 0 |
| | 0 |

| | |
|---|---|
| | 0 |
| | 0 |
| | 0 |
| | 0 |
| | 0 |
| | 0 |
| 8.73 | 1.746 |
| | 0 |
| 10.84 | 5.42 |
| 28.2 | 2.82 |
| | 0 |
| | 0 |
| 11.97 | 7.182 |
| 10.48 | 5.24 |
| | 0 |
| | 0 |
| | 0 |
| | 0 |
| | 0 |
| 22.54 | 5.635 |
| | 0 |
| | 0 |
| | 0 |
| 17.7 | 4.425 |
| | 0 |
| | 0 |
| | 0 |
| 19.15 | 2.8725 |

| | |
|---|---|
| | 0 |
| | 0 |
| 143.29 | 14.329 |
| | 0 |
| | 0 |
| 16.74 | 1.674 |
| | 0 |
| 34.34 | 4.1208 |
| Cost per month calori intake (66018) | 316.3983 |

Appendix Table **3.6.62Per capita adult non-food consumption quintiles by zone**

| | Per capita adult quintiles from lowest (1) to highest (5) | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | Total |
| Central zone | 1078 | 1567 | 2451 | 3722 | 10614 | 686 |
| Eastern zone | 1094 | 1591 | 2453 | 3758 | 9725 | 3737 |
| Northwest zone | 1091 | 1569 | 2477 | 3740 | 10725 | 4502 |
| Southern | 1096 | 1570 | 2444 | 3774 | 11350 | 4345 |
| South east | 1099 | 1588 | 2488 | 3708 | 6843 | 3190 |
| Western | 1095 | 1613 | 2486 | 3769 | 12657 | 6240 |
| Mekelle | 1088 | 1563 | 2487 | 3826 | 13769 | 7436 |

Appendix Table **3.6.63Per capita adult total consumption quintiles by zone**

| | Per capita adult quintiles from lowest (1) to highest (5) | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | Total |
| Central zone | 5002 | 6867 | 8643 | 9931 | 15299 | 8476 |
| Eastern zone | 5180 | 6725 | 7683 | 9738 | 14817 | 8345 |
| Northwest zone | 6586 | 7242 | 9080 | 11685 | 13928 | 9994 |
| Southern | 5437 | 7478 | 8213 | 10295 | 14648 | 9008 |
| South east | 4745 | 7042 | 6994 | 8414 | 10158 | 7288 |
| Western | 4947 | 7420 | 8453 | 9010 | 12429 | 9286 |
| Mekelle | 7969 | 9840 | 12035 | 16410 | 24168 | 16812 |

Appendix Table **3.6.64Per capita adult food consumption quintiles by place of residence**

| | Per capita adult quintiles from lowest (1) to highest (5) | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | Total |
| Central zone | 5002 | 6867 | 8643 | 9931 | 15299 | 8476 |
| Urban | 5184 | 7778 | 10219 | 12243 | 17639 | 10854 |
| Rural | 4926 | 6451 | 7824 | 8302 | 11251 | 7045 |
| Eastern zone | 5180 | 6725 | 7683 | 9738 | 14817 | 8345 |
| Urban | 6573 | 8076 | 9255 | 11913 | 16335 | 10686 |
| Rural | 4338 | 6025 | 6659 | 7882 | 11675 | 6564 |
| Northwest zone | 6586 | 7242 | 9080 | 11685 | 13928 | 9994 |
| Urban | 8633 | 9204 | 12060 | 15023 | 17604 | 13219 |
| Rural | 4902 | 6305 | 7542 | 9448 | 10122 | 7815 |
| Southern | 5437 | 7478 | 8213 | 10295 | 14648 | 9008 |
| Urban | 5611 | 8253 | 8628 | 11364 | 17208 | 10564 |
| Rural | 5342 | 6937 | 7946 | 9222 | 11408 | 7787 |
| South east | 4745 | 7042 | 6994 | 8414 | 10158 | 7288 |
| Urban | 4952 | 7954 | 6371 | 8993 | 8460 | 7373 |
| Rural | 4715 | 6989 | 7073 | 8314 | 10494 | 7277 |
| Western | 4947 | 7420 | 8453 | 9010 | 12429 | 9286 |
| Urban | 5273 | 9476 | 9980 | 10696 | 14210 | 11271 |
| Rural | 4682 | 5661 | 7030 | 7564 | 9079 | 7078 |
| Mekelle | 7969 | 9840 | 12035 | 16410 | 24168 | 16812 |
| Urban | 7969 | 9840 | 12035 | 16410 | 24168 | 16812 |
| Rural | | | | | | |

Appendix Table **3.6.65Per capita adult food consumption quintiles by zone and gender**

| | Per capita adult quintiles from lowest (1) to highest (5) | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | Total |
| Central zone | 5002 | 6867 | 8643 | 9931 | 15299 | 8476 |
| Male | 5742 | 7068 | 8875 | 9984 | 15045 | 9079 |
| Female | 4177 | 6394 | 7907 | 9697 | 16505 | 6995 |
| Eastern zone | 5180 | 6725 | 7683 | 9738 | 14817 | 8345 |
| Male | 6079 | 7137 | 7627 | 9639 | 15101 | 9132 |
| Female | 4581 | 6194 | 7790 | 10067 | 13950 | 7096 |
| Northwest zone | 6586 | 7242 | 9080 | 11685 | 13928 | 9994 |
| Male | 7357 | 7879 | 8986 | 11925 | 13156 | 10340 |
| Female | 5826 | 5727 | 9349 | 10653 | 16668 | 9094 |
| Southern | 5437 | 7478 | 8213 | 10295 | 14648 | 9008 |
| Male | 5961 | 7796 | 8760 | 10676 | 14265 | 9836 |
| Female | 5085 | 6985 | 7075 | 9194 | 16113 | 7554 |
| South east | 4745 | 7042 | 6994 | 8414 | 10158 | 7288 |
| Male | 5576 | 7578 | 7221 | 8725 | 10751 | 8084 |
| Female | 4276 | 5545 | 6359 | 6839 | 7843 | 5511 |
| Western | 4947 | 7420 | 8453 | 9010 | 12429 | 9286 |
| Male | 5579 | 7199 | 8124 | 9136 | 11800 | 9263 |
| Female | 3991 | 7875 | 9595 | 8617 | 14870 | 9351 |
| Mekelle | 7969 | 9840 | 12035 | 16410 | 24168 | 16812 |
| Male | 9093 | 10965 | 13374 | 15707 | 24686 | 18751 |
| Female | 7445 | 8821 | 10936 | 17361 | 23002 | 14389 |

Appendix Table **3.6.66Per capita adult non-food consumption quintiles by place of residence**

| | Per capita adult quintiles from lowest (1) to highest (5) | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | Total |
| Central zone | 1078 | 1567 | 2451 | 3722 | 10614 | 686 |
| Urban | 1083 | 1572 | 2453 | 3777 | 11741 | 4861 |
| Rural | 1075 | 1565 | 2450 | 3684 | 8655 | 2917 |
| Eastern zone | 1094 | 1591 | 2453 | 3758 | 9725 | 3737 |
| Urban | 1100 | 1586 | 2442 | 3783 | 10970 | 4838 |
| Rural | 1091 | 1593 | 2460 | 3736 | 7158 | 2864 |
| Northwest zone | 1091 | 1569 | 2477 | 3740 | 10725 | 4502 |
| Urban | 1094 | 1573 | 2488 | 3711 | 12418 | 5594 |
| Rural | 1089 | 1567 | 2472 | 3759 | 8982 | 3789 |
| Sothern zone | 1096 | 1570 | 2444 | 3774 | 11350 | 4345 |
| Urban | 1088 | 1605 | 2457 | 3829 | 12418 | 5087 |
| Rural | 1101 | 1545 | 2436 | 3718 | 9990 | 3706 |
| South east | 1099 | 1588 | 2488 | 3708 | 6843 | 3190 |
| Urban | 1021 | 1574 | 2604 | 3717 | 6293 | 3674 |
| Rural | 1107 | 1589 | 2474 | 3706 | 6957 | 3128 |
| Western | 1095 | 1613 | 2486 | 3769 | 12657 | 6240 |
| Urban | 1102 | 1631 | 2531 | 3803 | 13396 | 7345 |
| Rural | 1088 | 1598 | 2445 | 3740 | 11259 | 4952 |
| Mekelle | 1088 | 1563 | 2487 | 3826 | 13769 | 7436 |
| Urban | 1088 | 1563 | 2487 | 3826 | 13769 | 7436 |
| Rural | | | | | | |

Appendix Table **3.6.67Per capita adult non-food consumption quintiles by zone and gender**

| | Per capita adult quintiles from lowest (1) to highest (5) | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | Total |
| Central zone | 1078 | 1567 | 2451 | 3722 | 10614 | 686 |
| Male | 1079 | 1573 | 2450 | 3713 | 10283 | 3795 |
| Female | 1077 | 1554 | 2454 | 3764 | 12191 | 3341 |
| Eastern zone | 1094 | 1591 | 2453 | 3758 | 9725 | 3737 |
| Male | 1097 | 1597 | 2446 | 3747 | 9680 | 3986 |
| Female | 1091 | 1582 | 2467 | 3794 | 9859 | 3235 |
| Northwest zone | 1091 | 1569 | 2477 | 3740 | 10725 | 4502 |
| Male | 1088 | 1568 | 2476 | 3756 | 10201 | 4505 |
| Female | 1094 | 1572 | 2480 | 3669 | 12592 | 4493 |
| Sothern zone | 1096 | 1570 | 2444 | 3774 | 11350 | 4345 |
| Male | 1107 | 1589 | 2449 | 3774 | 11781 | 4797 |
| Female | 1085 | 1541 | 2433 | 3772 | 9710 | 3334 |
| South east | 1099 | 1588 | 2488 | 3708 | 6843 | 3190 |
| Male | 1105 | 1614 | 2515 | 3727 | 7058 | 3339 |
| Female | 1093 | 1514 | 2413 | 3610 | 6031 | 2721 |
| Western | 1095 | 1613 | 2486 | 3769 | 12657 | 6240 |
| Male | 1090 | 1613 | 2482 | 3773 | 13738 | 6829 |
| Female | 1108 | 1613 | 2501 | 3759 | 8448 | 4368 |
| Mekelle | 1088 | 1563 | 2487 | 3826 | 13769 | 7436 |
| Male | 1091 | 1596 | 2489 | 3851 | 14886 | 8907 |
| Female | 1085 | 1533 | 2485 | 3793 | 11252 | 5349 |

Appendix Table **3.6.68Per capita adult total consumption quintiles by place of residence**

| | Per capita adult quintiles from lowest (1) to highest (5) | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | Total |
| Central zone | 5002 | 6867 | 8643 | 9931 | 15299 | 8476 |
| Urban | 5862 | 9317 | 12672 | 16021 | 29307 | 15101 |
| Rural | 5555 | 7915 | 10258 | 11871 | 19907 | 9393 |
| Eastern zone | 5180 | 6725 | 7683 | 9738 | 14817 | 8345 |
| Urban | 6951 | 9612 | 11484 | 15509 | 27178 | 14590 |
| Rural | 4953 | 7526 | 9072 | 11619 | 18782 | 8897 |
| Northwest zone | 6586 | 7242 | 9080 | 11685 | 13928 | 9994 |
| Urban | 9154 | 10777 | 14547 | 18656 | 30022 | 18104 |
| Rural | 5614 | 7825 | 9989 | 13110 | 19056 | 11226 |
| Sothern zone | 5437 | 7478 | 8213 | 10295 | 14648 | 9008 |
| Urban | 6270 | 9771 | 11033 | 15138 | 29580 | 14962 |
| Rural | 5984 | 8455 | 10349 | 12941 | 21430 | 10822 |
| South east | 4745 | 7042 | 6994 | 8414 | 10158 | 7288 |
| Urban | 5491 | 9528 | 8976 | 12711 | 14328 | 10381 |
| Rural | 5371 | 8578 | 9547 | 12023 | 17463 | 9990 |
| Western | 4947 | 7420 | 8453 | 9010 | 12429 | 9286 |
| Urban | 5996 | 11107 | 12392 | 14398 | 27688 | 18112 |
| Rural | 5357 | 7137 | 9336 | 11304 | 19861 | 11348 |
| Mekelle | 7969 | 9840 | 12035 | 16410 | 24168 | 16812 |
| Urban | 8609 | 11265 | 14221 | 20083 | 37822 | 23363 |
| Rural | | | | | | |

Appendix Table **3.6.69Per capita adult total consumption quintiles by zone and gender**

| | Per capita adult quintiles from lowest (1) to highest (5) | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | Total |
| Central zone | 5002 | 6867 | 8643 | 9931 | 15299 | 8476 |
| Male | 6437 | 8559 | 11309 | 13597 | 25280 | 12411 |
| Female | 4774 | 7862 | 10362 | 13461 | 28697 | 9364 |
| Eastern zone | 5180 | 6725 | 7683 | 9738 | 14817 | 8345 |
| Male | 6617 | 8604 | 9971 | 13295 | 24640 | 12583 |
| Female | 5106 | 7749 | 10151 | 13861 | 23810 | 9426 |
| Northwest zone | 6586 | 7242 | 9080 | 11685 | 13928 | 9994 |
| Male | 8032 | 9390 | 11435 | 15560 | 23317 | 14485 |
| Female | 6418 | 7299 | 11829 | 14322 | 29261 | 12712 |
| Sothern zone | 5437 | 7478 | 8213 | 10295 | 14648 | 9008 |
| Male | 6614 | 9327 | 11176 | 14416 | 26041 | 14134 |
| Female | 5727 | 8488 | 9458 | 12967 | 25824 | 10039 |
| South east | 4745 | 7042 | 6994 | 8414 | 10158 | 7288 |
| Male | 6346 | 9192 | 9736 | 12455 | 17823 | 11217 |
| Female | 4849 | 7060 | 8772 | 10449 | 13555 | 7420 |
| Western | 4947 | 7420 | 8453 | 9010 | 12429 | 9286 |
| Male | 6410 | 8681 | 10438 | 12914 | 25411 | 15569 |
| Female | 4531 | 9489 | 12097 | 12211 | 23318 | 13008 |
| Mekelle | 7969 | 9840 | 12035 | 16410 | 24168 | 16812 |
| Male | 9837 | 12242 | 15338 | 19475 | 39413 | 26955 |
| Female | | | | | | |

**Appendix Table 3.6. 70 Determinates of Poverty status: logit model estimation by zone**

| Variables | Central Zone | | Urban | | Rural | |
|---|---|---|---|---|---|---|
| | ME | S. E | ME | SE | ME | SE |
| Gender (1=male, 0 other wise) | -0.2021*** | 0.0222 | -0.2075*** | 0.0299 | -0.2092*** | 0.0308 |
| Age in years | -0.0326*** | 0.0039 | -0.0284*** | 0.0051 | -0.0328*** | 0.0055 |
| Age square | 0.0003*** | 0.0000 | 0.0002*** | 0.0000 | 0.0003*** | 0.0000 |
| Lnedu (education expenditure in Birr in log form) | -0.0226*** | 0.0033 | -0.0101** | 0.0044 | -0.0217*** | .00476 |
| Adult_equivalent | 0.0106 | 0.0255 | -0.1442*** | 0.0356 | 0.0630* | 0.0345 |
| Income_diversification[19] | -0.0667*** | 0.0153 | -0.1022*** | 0.02166 | -0.0248 | 0.02037 |
| Lnasset (value of assets in birr in n atural log form) | -0.0132*** | 0.0026 | -0.0009 | .00378 | 0.0041 | 0.0040 |
| Tropical_livestock_unit | -0.0200*** | 0.0051 | 0.0014 | 0.0081 | -0.0539*** | 0.007 |
| Lnland-size(in ha) | 0.0239 | 0.0274 | 0.0927** | .04151 | -0.0907** | 0.0371 |
| Correctly predicted | 68% | | 76.4% | | 68.22% | |
| LR chi2(9) | 362.76 | | 194.84 | | 275.4 | |
| Prob>chi2 | 0.0000 | | 0.0000 | | 0.0000 | |
| Pseudo R2 | 0.095 | | 0.1574 | | 0.11 | |
| Number of observations | 2,894 | | 1,069 | | 1,825 | |

[19] See the income diversification given above.

**Appendix Table 3.6. 71 Determinates of Poverty status: logit model estimation by zone**

| Variables | Central Zone | | Male | | Female | |
|---|---|---|---|---|---|---|
| | ME | S. E | ME | SE | ME | SE |
| Gender (1=male, 0 other wise) | -0.2021*** | 0.0222 | - | - | | |
| Age in years | -0.0326*** | 0.0039 | -0.0360 | 0.0044 | -0.0360*** | 0.0044 |
| Age square | 0.0003*** | 0.0000 | 0.0003 | 0.0000 | 0.0003*** | 0.0000 |
| Lnedu (education expenditure in Birr in log form) | -0.0226*** | 0.0033 | -0.0218 | 0.0036 | -0.0218*** | 0.0036 |
| Adult_equivalent | 0.0106 | 0.0255 | 0.0046 | 0.0282 | 0.0046 | 0.0282 |
| Income_diversification[20] | -0.0667*** | 0.0153 | -0.0488 | 0.0166 | -0.0488*** | 0.0166 |
| Lnasset (value of assets in birr in n atural log form) | -0.0132*** | 0.0026 | -0.0120 | 0.0028 | -0.0120** | 0.0028 |
| Tropical_livestock_unit | -0.0200*** | 0.0051 | -0.0133 | 0.0047 | -0.0133*** | 0.0047 |
| Lnland-size(in ha) | 0.0239 | 0.0274 | -0.0174 | 0.0292 | -0.0174*** | 0.0292 |
| Correctly predicted | 68% | | 72% | | 63% | |
| LR chi2(9) | 362.76 | | 175.1 | | 82.5 | |
| Prob>chi2 | 0.0000 | | 0.000 | | 0.0000 | |
| Pseudo R2 | 0.095 | | 0.065 | | 0.070 | |
| Number of observations | 2,894 | | 2,049 | | 845 | |

[20] See the income diversification given above.

**Appendix Table 3.6. 72 Determinates of Poverty status: logit model estimation by zone**

| Variables | Eastern Zone | | Urban | | Rural | |
|---|---|---|---|---|---|---|
| | ME | S. E | ME | SE | ME | SE |
| Gender (1=male, 0 other wise) | -0.2054*** | 0.0249 | -0.1394*** | 0.0314 | -0.1394*** | 0.0314 |
| Age in years | -0.0162*** | 0.0046 | -0.0120* | 0.0062 | -0.0120*** | 0.0062 |
| Age square | 0.0002*** | 0.0000 | 0.0001** | 0.0000 | 0.0001*** | 0.0000 |
| Lnedu (education expenditure in Birr in log form) | -0.0320*** | 0.0039 | -0.0264*** | 0.0048 | -0.0264*** | 0.0048 |
| Adult_equivalent | -0.0833*** | 0.0301 | -0.1306*** | 0.0392 | -0.1306 | 0.0392 |
| Income_diversification[21] | -0.0361** | 0.0165 | -0.0953*** | 0.0224 | -0.0953 | 0.0224 |
| Lnasset (value of assets in birr in n atural log form) | -0.0184*** | 0.0028 | -0.0135*** | 0.0035 | -0.0135 | 0.0035 |
| Tropical_livestock_unit | -0.0295*** | 0.0079 | -0.0001 | 0.0121 | -0.0001*** | 0.0121 |
| Lnland-size(in ha) | 0.0277 | 0.0351 | 0.0868** | 0.0432 | 0.0868* | 0.0432 |
| Correctly predicted | 70% | | 76% | | 69% | |
| LR chi2(9) | 379.7 | | 178.8 | | 244.6 | |
| Prob>chi2 | 0.0000 | | 0.0000 | | 0.000 | |
| Pseudo R2 | 0.1336 | | 0.162 | | 0.146 | |
| Number of observations | 2,137 | | 924 | | 1,213 | |

[21] See the income diversification given above.

**Appendix Table 3.6.73 Determinates of Poverty status: logit model estimation by zone**

| Variables | Eastern Zone | | Male | | Female | |
|---|---|---|---|---|---|---|
| | ME | S. E | ME | SE | ME | SE |
| Gender (1=male, 0 other wise) | -0.2054*** | 0.0249 | | | | |
| Age in years | -0.0162*** | 0.0046 | -0.0209*** | 0.0056 | -0.0209** | 0.0056 |
| Age square | 0.0002*** | 0.0000 | 0.0002*** | 0.000 | 0.0002*** | 0.0000 |
| Lnedu (education expenditure in Birr in log form) | -0.0320*** | 0.0039 | -0.0314*** | 0.0044 | -0.0314*** | 0.0044 |
| Adult_equivalent | -0.0833*** | 0.0301 | -0.0218 | 0.0352 | -0.0218*** | 0.0352 |
| Income_diversification[22] | -0.0361** | 0.0165 | 0.0094 | 0.0175 | 0.0094*** | 0.0175 |
| Lnasset (value of assets in birr in n atural log form) | -0.0184*** | 0.0028 | -0.0154*** | 0.0032 | -0.0154*** | 0.0032 |
| Tropical_livestock_unit | -0.0295*** | 0.0079 | -0.0196*** | 0.0076 | -0.0196** | 0.0076 |
| Lnland-size(in ha) | 0.0277 | 0.0351 | -0.0462 | 0.0419 | -0.0462** | 0.0419 |
| Correctly predicted | 70% | | 72% | | 68.3% | |
| LR chi2(9) | 379.7 | | 140.75 | | 171.8 | |
| Prob>chi2 | 0.0000 | | 0.000 | | 0.000 | |
| Pseudo R2 | 0.1336 | | 0.088 | | 0.15 | |
| Number of observations | 2,137 | | 1,313 | | 824 | |

[22] See the income diversification given above.

**Appendix Table 3.6.74 Determinates of Poverty status: logit model estimation by zone**

| Variables | North west Zone | | Urban | | Rural | |
|---|---|---|---|---|---|---|
| | ME | S. E | ME | SE | ME | SE |
| Gender (1=male, 0 other wise) | -0.1030*** | 0.0233 | -0.0270 | 0.0284 | -0.1990*** | 0.037 |
| Age in years | -0.0157*** | 0.0036 | -0.0058 | 0.0050 | -0.0246*** | 0.0052 |
| Age square | 0.0001*** | 0.0000 | 0.0001 | 0.0000 | 0.0002*** | 0.0000 |
| Lnedu (education expenditure in Birr in log form) | -0.0066** | 0.0032** | -0.0102 | 0.0041 | 0.0054 | 0.0050 |
| Adult_equivalent | -0.0711*** | 0.02677*** | -0.0969 | 0.0362 | -0.0910** | 0.0388 |
| Income_diversification[23] | -0.0292** | 0.0119 | -0.0041 | 0.0151 | -0.0501*** | 0.0180 |
| Lnasset (value of assets in birr in n atural log form) | -0.0152*** | 0.0022*** | -0.0129 | 0.0031 | -0.0045 | 0.0036 |
| Tropical_livestock_unit | -0.0373*** | 0.0038*** | -0.0286 | 0.0061 | -0.0459*** | 0.0049 |
| Lnland-size(in ha) | 0.0972*** | 0.0283** | 0.0880 | 0.0396 | 0.0494 | 0.0345 |
| Correctly predicted | 76% | | 79% | | 75.3% | |
| LR chi2(9) | 295.12 | | 68.6 | | 286.8 | |
| Prob>chi2 | 0.000 | | 0.000 | | 0.000 | |
| Pseudo R2 | 0.133 | | 0.06 | | 0.203 | |
| Number of observations | 1,960 | | 788 | | 1,172 | |

[23] See the income diversification given above.

**Appendix Table 3.6. 75 Determinates of Poverty status: logit model estimation by zone**

| Variables | North west Zone | | Male | | Female | |
|---|---|---|---|---|---|---|
| | ME | S. E | ME | SE | ME | SE |
| Gender (1=male, 0 other wise) | -0.1030*** | 0.0233 | | | | |
| Age in years | -0.0157*** | 0.0036 | -0.0171*** | 0.0039 | -0.0177** | 0.0084 |
| Age square | 0.0001*** | 0.0000 | 0.0001*** | 0.0000 | 0.0002** | 0.0000 |
| Lnedu (education expenditure in Birr in log form) | -0.0066** | 0.0032** | -0.0043 | 0.0033 | -0.0108 | 0.0076 |
| Adult_equivalent | -0.0711*** | 0.02677*** | -0.0702** | 0.0281 | -0.0835 | 0.0614 |
| Income_diversification[24] | -0.0292** | 0.0119 | -0.0174 | 0.0124 | -0.0520* | 0.0279 |
| Lnasset (value of assets in birr in natural log form) | -0.0152*** | 0.0022*** | -0.0106*** | 0.0023 | -0.0259*** | 0.0054 |
| Tropical_livestock_unit | -0.0373*** | 0.0038*** | -0.0307*** | 0.0035 | -0.0433*** | 0.0123 |
| Lnland-size(in ha) | 0.0972*** | 0.0283** | 0.0632** | 0.0262 | 0.2047*** | 0.0771 |
| Correctly predicted | 76% | | 80.1% | | 67% | |
| LR chi2(9) | 295.12 | | 157.5 | | 77.17 | |
| Prob>chi2 | 0.000 | | 0.000 | | 0.000 | |
| Pseudo R2 | 0.133 | | 0.111 | | 0.106 | |
| Number of observations | 1,960 | | 1,417 | | 543 | |

[24] See the income diversification given above.

**Appendix Table 3.6. 76 Determinates of Poverty status: logit model estimation by zone**

| Variables | Southern Zone | | Urban | | Rural | |
|---|---|---|---|---|---|---|
| | ME | S. E | ME | SE | ME | SE |
| Gender (1=male, 0 other wise) | -0.2138*** | 0.0251 | -0.2195*** | 0.0313 | -0.2123*** | 0.0381 |
| Age in years | -0.0268*** | 0.0043 | -0.0179*** | 0.0057 | -0.0323*** | 0.0063 |
| Age square | 0.0002*** | 0.0000 | 0.0002*** | 0.0000 | 0.0003*** | 0.0000 |
| Lnedu (education expenditure in Birr in log form) | -0.0213*** | 0.0037 | -0.0244*** | 0.0047 | -0.0054 | 0.0057 |
| Adult_equivalent | -0.0829*** | 0.0286 | -0.1772*** | 0.0402 | -0.0363 | 0.0405 |
| Income_diversification[25] | -0.0581*** | 0.0168 | -0.0762*** | 0.0223 | -0.0270 | 0.0245 |
| Lnasset (value of assets in birr in natural log form) | -0.0080*** | 0.0026 | 0.0014 | 0.0040 | 0.0037 | 0.0044 |
| Tropical_livestock_unit | -0.0335*** | 0.0062 | -0.0174 | 0.0127 | -0.0543*** | 0.0076 |
| Lnland-size(in ha) | 0.0611** | 0.0299 | 0.1924*** | 0.0559 | -0.0470 | 0.0418 |
| Correctly predicted | 74.4% | | 76.4% | | 74.8% | |
| LR chi2(9) | 355.6 | | 217.3 | | 217.8 | |
| Prob>chi2 | 0.000 | | 0.000 | | 0.000 | |
| Pseudo R2 | 0.148 | | 0.214 | | 0.157 | |
| Number of observations | 1,954 | | 864 | | 1,090 | |

[25] See the income diversification given above.

**Appendix Table 3.6. 77 Determinates of Poverty status: logit model estimation by zone**

| Variables | Southern Zone | | Male | | Female | |
|---|---|---|---|---|---|---|
| | ME | S. E | ME | SE | ME | SE |
| Gender (1=male, 0 other wise) | -0.2138*** | 0.0251 | - | - | - | - |
| Age in years | -0.0268*** | 0.0043 | -0.0224*** | 0.0044 | -0.0308*** | 0.0087 |
| Age square | 0.0002*** | 0.0000 | 0.0002*** | 0.0000 | 0.0003*** | 0.0000 |
| Lnedu (education expenditure in Birr in log form) | -0.0213*** | 0.0037 | -0.0129*** | 0.0039 | -0.0323*** | 0.0068 |
| Adult_equivalent | -0.0829*** | 0.0286 | -0.0533* | 0.0302 | -0.1254** | 0.0533 |
| Income_diversification[26] | -0.0581*** | 0.0168 | -0.0238 | 0.0171 | -0.1141*** | 0.0325 |
| Lnasset (value of assets in birr in natural log form) | -0.0080*** | 0.0026 | -0.0088*** | 0.0027 | -0.0047 | 0.0049 |
| Tropical_livestock_unit | -0.0335*** | 0.0062 | -0.0250*** | 0.0052 | -0.0433** | 0.0195 |
| Lnland-size(in ha) | 0.0611** | 0.0299 | 0.0288 | 0.0323 | 0.1226** | 0.0608 |
| Correctly predicted | 74.4% | | 80.2% | | 65% | |
| LR chi2(9) | 355.6 | | 106.4 | | 104.5 | |
| Prob>chi2 | 0.000 | | 0.000 | | 0.000 | |
| Pseudo R2 | 0.148 | | 0.083 | | 0.107 | |
| Number of observations | 1,954 | | 1,245 | | 709 | |

[26] See the income diversification given above.

**Appendix Table 3.6.78 Determinates of Poverty status: logit model estimation by zone**

| Variables | South east Zone | | Urban | | Rural | |
|---|---|---|---|---|---|---|
| | ME | S. E | ME | SE | ME | SE |
| Gender (1=male, 0 other wise) | -0.1725*** | 0.0429 | -0.1276 | 0.1187 | -0.1752*** | 0.0463 |
| Age in years | -0.0249*** | 0.0069 | -0.0278 | 0.0211 | -0.0261*** | 0.0075 |
| Age square | 0.0002*** | 0.0000 | 0.0002 | 0.0002 | 0.0002*** | 0.0000 |
| Lnedu (education expenditure in Birr in log form) | -0.0011 | 0.0065 | -0.0114 | 0.0184 | 0.0005 | 0.0071 |
| Adult_equivalent | 0.0233 | 0.0457 | 0.0398 | 0.1252 | 0.0192 | 0.0493 |
| Income_diversification[27] | -0.0929*** | 0.0315 | -0.0851 | 0.0917 | -0.0944*** | 0.0337 |
| Lnasset (value of assets in birr in natural log form) | -0.0024 | 0.0057 | -0.0105 | 0.0159 | -0.0023 | 0.0062 |
| Tropical_livestock_unit | -0.1021*** | 0.0118 | -0.1485*** | 0.0484 | -0.0999*** | 0.0124 |
| Lnland-size(in ha) | 0.0041 | 0.0525 | 0.1964 | 0.1966 | -0.0160 | 0.0558 |
| Correctly predicted | 75% | | 70.6% | | 75.5% | |
| LR chi2(9) | 215.5 | | 24.4 | | 196.8 | |
| Prob>chi2 | 0.000 | | 0.000 | | 0.000 | |
| Pseudo R2 | 0.216 | | 0.205 | | 0.224 | |
| Number of observations | 783 | | 92 | | 691 | |

[27] See the income diversification given above.

**Appendix Table 3.6. 79 Determinates of Poverty status: logit model estimation by zone**

| Variables | South east Zone | | Male | | Female | |
|---|---|---|---|---|---|---|
| | ME | S. E | ME | SE | ME | SE |
| Gender (1=male, 0 other wise) | -0.1725*** | 0.0429 | | | | |
| Age in years | -0.0249*** | 0.0069 | -0.0212*** | 0.0062 | -0.0419 | 0.0167 |
| Age square | 0.0002*** | 0.0000 | 0.0002*** | 0.0000 | 0.0004 | 0.0001 |
| Lnedu (education expenditure in Birr in log form) | -0.0011 | 0.0065 | 0.0022 | 0.0058 | -0.0078 | 0.0143 |
| Adult_equivalent | 0.0233 | 0.0457 | 0.0616 | 0.0412 | -0.0723 | 0.1019 |
| Income_diversification[28] | -0.0929*** | 0.0315 | -0.0570** | 0.029 | -0.1343 | 0.0665 |
| Lnasset (value of assets in birr in natural log form) | -0.0024 | 0.0057 | -0.0049 | 0.0050 | 0.0110 | 0.0130 |
| Tropical_livestock_unit | -0.1021*** | 0.0118 | -0.0680*** | 0.0090 | -0.1837 | 0.0479 |
| Lnland-size(in ha) | 0.0041 | 0.0525 | -0.0223 | 0.0521 | 0.0756 | 0.1087 |
| Correctly predicted | 75% | | 78.2% | | 69% | |
| LR chi2(9) | 215.5 | | 92.5 | | 51.25 | |
| Prob>chi2 | 0.000 | | 0.000 | | 0.000 | |
| Pseudo R2 | 0.216 | | 0.159 | | 0.156 | |
| Number of observations | 783 | | 542 | | 241 | |

[28] See the income diversification given above.

**Appendix Table 3.6. 80 Determinates of Poverty status: logit model estimation by zone**

| Variables | Western Zone | | Urban | | Rural | |
|---|---|---|---|---|---|---|
| | ME | S. E | ME | SE | ME | SE |
| Gender (1=male, 0 other wise) | -0.1209 | 0.0363 | -0.1150*** | 0.0424 | -0.1889*** | 0.0635 |
| Age in years | -0.0301 | 0.0055 | -0.0196*** | 0.0064 | -0.0342*** | 0.0092 |
| Age square | 0.0003 | 0.0000 | 0.0002*** | 0.0000 | 0.0003*** | 0.0000 |
| Lnedu (education expenditure in Birr in log form) | -0.0079 | 0.0048 | -0.0088* | 0.0053 | 0.0070 | 0.0086 |
| Adult_equivalent | -0.0227 | 0.0403 | -0.1147** | 0.0451 | 0.0443 | 0.0685 |
| Income_diversification[29] | -0.0309 | 0.0187 | -0.0139 | 0.0231 | -0.0544* | 0.0288 |
| Lnasset (value of assets in birr in natural log form) | -0.0167 | 0.0037 | -0.0139*** | 0.0042 | 0.0063 | 0.0074 |
| Tropical_livestock_unit | -0.0164 | 0.0042 | -0.0141** | 0.0059 | -0.0283*** | 0.0066 |
| Lnland-size(in ha) | 0.1267 | 0.0443 | 0.1998*** | 0.0532 | -0.1173 | 0.0763 |
| Correctly predicted | 74.8% | | 81.3% | | 71% | |
| LR chi2(9) | 112.85 | | 71.5 | | 81.99 | |
| Prob>chi2 | 0.000 | | 0.000 | | 0.000 | |
| Pseudo R2 | 0.100 | | 0.14 | | 0.139 | |
| Number of observations | 976 | | 514 | | 462 | |

[29] See the income diversification given above.

**Appendix Table 3.6. 81 Determinates of Poverty status: logit model estimation by zone**

| Variables | Western Zone | | Male | | Female | |
|---|---|---|---|---|---|---|
| | ME | S. E | ME | SE | ME | SE |
| Gender (1=male, 0 other wise) | -0.1209 | 0.0363 | - | - | - | - |
| Age in years | -0.0301 | 0.0055 | -0.0347*** | 0.0063 | -0.0306** | 0.014 |
| Age square | 0.0003 | 0.0000 | 0.0003*** | 0.0000 | 0.0003** | 0.0001 |
| Lnedu (education expenditure in Birr in log form) | -0.0079 | 0.0048 | -0.0048 | 0.0052 | -0.0162 | 0.0115 |
| Adult_equivalent | -0.0227 | 0.0403 | 0.0097 | 0.0442 | -0.1301 | 0.0935 |
| Income_diversification[30] | -0.0309 | 0.0187 | -0.0020 | 0.0193 | -0.1266** | 0.0508 |
| Lnasset (value of assets in birr in natural log form) | -0.0167 | 0.0037 | -0.0092** | 0.0042 | -0.0329*** | 0.0082 |
| Tropical_livestock_unit | -0.0164 | 0.0042 | -0.0126*** | 0.0039 | -0.0283 | 0.0185 |
| Lnland-size(in ha) | 0.1267 | 0.0443 | 0.0708 | 0.0470 | 0.3200*** | 0.1176 |
| Correctly predicted | 74.8% | | 78.42% | | 69.57% | |
| LR chi2(9) | 112.85 | | 56.15 | | 54.46 | |
| Prob>chi2 | 0.000 | | 0.000 | | 0.000 | |
| Pseudo R2 | 0.100 | | 0.0735 | | 0.162 | |
| Number of observations | 976 | | 723 | | 253 | |

[30] See the income diversification given above.

**Appendix Table 3.6. 82 Determinates of Poverty status: logit model estimation by zone**

| Variables | Mekelle Zone | | Urban | | Rural | |
|---|---|---|---|---|---|---|
| | ME | S. E | ME | SE | ME | SE |
| Gender (1=male, 0 other wise) | -0.0708*** | 0.0143 | -0.0708*** | 0.0143 | | |
| Age in years | -0.0077*** | 0.0021 | -0.0077*** | 0.0021 | | |
| Age square | 0.0001*** | 0.0000 | 0.0001*** | 0.0000 | | |
| Lnedu (education expenditure in Birr in log form) | -0.0086*** | 0.0018 | -0.0086*** | 0.0018 | | |
| Adult_equivalent | -0.1125*** | 0.0169 | -0.1125*** | 0.0169 | | |
| Income_diversification[31] | -0.0402*** | 0.0082 | -0.0402*** | 0.0082 | | |
| Lnasset (value of assets in birr in natural log form) | 0.0001 | 0.0022 | 0.0001 | 0.0022 | | |
| Tropical_livestock_unit | 0.0075** | 0.0036 | 0.0075** | 0.0036 | | |
| Lnland-size(in ha) | 0.0304* | 0.0163 | 0.0304* | 0.0163 | | |
| Correctly predicted | 87.3% | | 87.3% | | | |
| LR chi2(9) | 244.26 | | 244.26 | | | |
| Prob>chi2 | 0.000 | | 0.000 | | | |
| Pseudo R2 | 0.1944 | | 0.1944 | | | |
| Number of observations | 1,599 | | 1,599 | | | |

[31] See the income diversification given above.

**Appendix Table 3.6. 83 Determinates of Poverty status: logit model estimation by zone**

| Variables | Mekelle Zone | | Male | | Female | |
|---|---|---|---|---|---|---|
| | ME | S. E | ME | SE | ME | SE |
| Gender (1=male, 0 other wise) | -0.0708*** | 0.0143 | | | | |
| Age in years | -0.0077*** | 0.0021 | -0.0045*** | 0.0016 | -0.0108** | 0.0051 |
| Age square | 0.0001*** | 0.0000 | 0.0001** | 0.0000 | 0.0001** | 0.0000 |
| Lnedu (education expenditure in Birr in log form) | -0.0086*** | 0.0018 | -0.0033*** | 0.0012 | -0.0152*** | 0.0043 |
| Adult_equivalent | -0.1125*** | 0.0169 | -0.0443*** | 0.0121 | -0.2072*** | 0.0384 |
| Income_diversification[32] | -0.0402*** | 0.0082 | -0.0333*** | 0.0065 | -0.0395** | 0.0184 |
| Lnasset (value of assets in birr in natural log form) | 0.0001 | 0.0022 | -0.0007 | 0.0013 | 0.0027 | 0.0052 |
| Tropical_livestock_unit | 0.0075** | 0.0036 | 0.0026 | 0.0020 | 0.0167 | 0.0105 |
| Lnland-size(in ha) | 0.0304* | 0.0163 | 0.0142 | 0.0115 | 0.0536 | 0.0359 |
| Correctly predicted | 87.3% | | 94% | | 80.7% | |
| LR chi2(9) | 244.26 | | 109.5 | | 91.4 | |
| Prob>chi2 | 0.000 | | 0.000 | | 0.000 | |
| Pseudo R2 | 0.1944 | | 0.24 | | 0.126 | |
| Number of observations | 1,599 | | 889 | | 710 | |

[32] See the income diversification given above.

## Urban areas

Appendix Table 3.7.1: Distribution of responses of surveyed households on credit (past year) by administration zone and sex

| **Credit status** | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mekelle | | Southern | | N.Western | | Western | | eastern | | Central | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| No | 1261 | 78.57 | 529 | 77.68 | 144 | 69.94 | 187 | 79.57 | 366 | 78.54 | 556 | 78.98 |
| Yes | 344 | 21.43 | 152 | 22.32 | 335 | 30.06 | 48 | 20.43 | 100 | 21.46 | 148 | 21.02 |
| **Total** | **1605** | **100** | **681** | **100** | **479** | **100** | **235** | **100** | **466** | **100** | **704** | **100** |
| **Credit status** | **Administration zones and sex** | | | | | | | | | | | |
| | Mekelle | | Southern | | N.Western | | Western | | eastern | | Central | |
| | Male | Female | Male | Female | Male | Female | Male | female | Male | female | Male | female |
| No | 698 | 563 | 268 | 261 | 206 | 129 | 116 | 71 | 196 | 170 | 338 | 218 |
| Yes | 195 | 149 | 78 | 74 | 92 | 52 | 28 | 20 | 55 | 45 | 94 | 54 |
| **Total** | **893** | **712** | **346** | **335** | **298** | **181** | **144** | **91** | **251** | **215** | **432** | **272** |

Appendix Table 3.7.2: Sources of loans for the surveyed households by administrative zones

| **Loan source** | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mekelle | | Southern | | N.Western | | Western | | eastern | | Central | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| DECSI | 128 | 37.43 | 66 | 42.86 | 75 | 52 | 19 | 39.58 | 36 | 36 | 64 | 43.24 |
| Other Micro Finance Institutions | 56 | 16.37 | 45 | 29.22 | 33 | 22.92 | 15 | 31.25 | 31 | 31 | 31 | 20.95 |
| Farmers' Cooperative | 1 | 0.29 | 1 | 0.65 | - | - | 2 | 4.17 | 1 | 1 | 2 | 1.35 |
| Government | 20 | 5.85 | 6 | 3.90 | 8 | 5.56 | 5 | 10.42 | 4 | 4 | 13 | 8.78 |
| Banks | 23 | 6.73 | 11 | 7.14 | 3 | 2.00 | 2 | 4.17 | 4 | 4 | 9 | 6.08 |
| Community Credit Associations | 3 | 0.88 | 1 | 0.65 | - | - | - | - | - | - | - | - |
| Money lenders | 97 | 28.39 | 17 | 11.04 | 22 | 15.28 | 4 | 8.33 | 19 | 19 | 21 | 14.19 |
| Family or friends | 14 | 4.09 | 4 | 2.60 | 2 | 1.39 | 1 | 2.08 | 5 | 5 | 8 | 5.41 |
| Other | - | - | 3 | 1.95 | 1 | 0.69 | - | - | | | - | - |
| **Total** | **342** | **100** | **154** | **100** | **144** | **100** | **48** | **100** | **100** | **100** | **148** | **100** |

Appendix Table 3.7.3: Responses on possible reasons hampering loan repayment on time

| **Loan source** | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mekelle | | Southern | | N.Western | | Western | | Eastern | | Central | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Other members late to pay | 1 | 2.17 | - | - | 3 | 14.29 | 2 | 22.22 | - | - | - | - |
| Too short time to pay | 9 | 19.57 | 1 | 5.88 | 6 | 28.57 | - | - | 2 | 16.67 | 2 | 15.38 |
| Bankrupt | 10 | 31.74 | 8 | 47.06 | 5 | 23.81 | 5 | 55.56 | 2 | 16.67 | 3 | 23.46 |
| No reason | 1 | 2.17 | 1 | 5.88 | 1 | 4.76 | - | - | - | - | - | - |
| Not proper use | 4 | 8.70 | - | - | 2 | 9.52 | - | - | 4 | 33.33 | 2 | 15.38 |
| Others | 21 | 45.65 | 7 | 41.18 | 4 | 19.05 | 2 | 22.22 | 4 | 33.33 | 6 | 46.15 |
| **Total** | **46** | **100** | **17** | **100** | **21** | **100** | **9** | **100** | **13** | **100** | **13** | **100** |

Appendix Table 3.7.4: Collateral related responses of surveyed households

| | **Responses** | | | | | |
|---|---|---|---|---|---|---|
| **Zones** | **No** | **%** | **Yes** | **%** | **Total** | **%** |
| Mekelle | 140 | 15.73 | 170 | 19.10 | 310 | 34.83 |
| Southern | 41 | 4.61 | 105 | 11.80 | 146 | 16.40 |
| N.Western | 81 | 9.10 | 64 | 7.19 | 145 | 16.29 |
| Western | 25 | 2.81 | 23 | 2.58 | 48 | 5.39 |
| Eastern | 30 | 3.37 | 70 | 7.87 | 100 | 11.24 |
| Central | 32 | 3.60 | 109 | 12.25 | 141 | 15.84 |
| **Total** | **349** | **39.21** | **541** | **60.79** | **890** | **100** |

Appendix Table 3.7.5: Average loan amount, collateral and loan repayment periods

| **Loan source** | **Administration zones** | | | | | |
|---|---|---|---|---|---|---|
| | Mekelle | Southern | N.Western | Western | Eastern | Central |
| Average loan amount (birr) | 92931 | 50958 | 52439 | 95965 | 34379 | 55711 |
| Estimated collateral property value (birr) | 951339 | 305503 | 377500 | 7788176 | 639389 | 522045 |
| Loan repayment period (months) | 29.72 | 29.04 | 34.45 | 26.14 | 24.46 | 26.79 |

Appendix Table 3.7.6: Responses of surveyed households on areas of loan utilization by zones

| **Areas of loan utilization** | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mekelle | | Southern | | N.Western | | Western | | Eastern | | Central | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Start a new business | 83 | 26.35 | 61 | 40.13 | 53 | 16.55 | 14 | 29.17 | 24 | 24.49 | 38 | 27.34 |
| Buy consumer durables | 50 | 15.87 | 15 | 9.87 | 21 | 14.48 | 6 | 12.50 | 25 | 25.51 | 29 | 20.86 |
| Travel expenses | 5 | 1.59 | 2 | 1.32 | 2 | 1.38 | - | - | - | - | 1 | 0.72 |
| Food | 42 | 13.33 | 14 | 9.21 | 20 | 13.79 | 2 | 4.17 | 20 | 20.41 | 33 | 23.74 |
| Medical needs | 2 | 0.63 | 3 | 1.97 | 1 | 0.69 | - | - | 1 | 1.02 | 1 | 0.72 |
| School fees | 4 | 1.27 | 1 | 0.66 | 4 | 2.76 | - | - | 7 | 7.14 | 1 | 0.72 |
| Marriage | - | - | 2 | 1.32 | 1 | 0.69 | - | - | - | - | - | - |
| Burial or funeral | 1 | 0.32 | - | - | - | - | - | - | 1 | 1.02 | - | - |
| Other ceremony | 7 | 2.22 | 5 | 3.29 | 14 | 9.66 | 8 | 16.67 | 3 | 3.06 | 5 | 3.60 |
| Repay other loan | 2 | 0.63 | 3 | 1.97 | 1 | 0.69 | - | - | - | - | 2 | 1.44 |
| Buy livestock | 3 | 0.95 | 2 | 1.32 | 8 | 5.52 | 2 | 4.17 | 2 | 2.04 | 3 | 2.16 |
| Build a house | 88 | 27.94 | 32 | 21.05 | 11 | 7.59 | 3 | 6.25 | 12 | 12.24 | 19 | 13.67 |
| Pay rents or taxes | 4 | 1.27 | 1 | 0.66 | - | - | - | - | - | - | - | - |
| Pay for hired labour | 1 | 0.32 | 1 | 0.66 | 1 | 0.69 | 1 | 2.08 | - | - | 2 | 1.44 |
| Others | 23 | 7.30 | 10 | 6.58 | 8 | 5.52 | 12 | 25.00 | 3 | 3.06 | 5 | 3.60 |
| **Total** | **315** | **100** | **152** | **100** | **145** | **100** | **48** | **100** | **98** | **100** | **139** | **100** |

Appendix Table 3.7.7: Response of households who saved money in 2009 E.C. by zones

| | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mekelle | | Southern | | N.Western | | Western | | eastern | | Central | |
| **Responses** | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| No | 1075 | 68.04 | 463 | 68.90 | 340 | 70.98 | 171 | 72.77 | 355 | 76.18 | 521 | 74.01 |
| Yes | 505 | 31.96 | 209 | 31.10 | 139 | 29.02 | 64 | 27.23 | 111 | 23.82 | 183 | 25.99 |
| **Total** | **1580** | **100** | **672** | **100** | **479** | **100** | **235** | **100** | **466** | **100** | **704** | **100** |

Appendix Table 3.7.8: Average saving of households who saved money in 2009 E.C.

| | Administration zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mekelle | | Southern | | N.Western | | Western | | Eastern | | Central | |
| **Saving areas** | No. | Average | No. | Average | No. | Average | No. | Average | No. | Average | No. | Average |
| Own home | 28 | 8929 | 10 | 5035 | 3 | 11133 | 1 | 1000 | 4 | 1130 | 3 | 14333 |
| DECSI | 83 | 12548 | 62 | 8970 | 53 | 15097 | 18 | 46218 | 24 | 37142 | 36 | 12885 |
| Cooperatives | 33 | 3970 | 14 | 6734 | 12 | 4345 | 3 | 5533 | 5 | 940 | 15 | 5749 |
| Friends | 3 | 6920 | 3 | 27933 | 2 | 4400 | - | - | - | - | - | - |
| Commercial banks | 390 | 57505 | 138 | 45249 | 84 | 92806 | 46 | 60568 | 80 | 30147 | 132 | 25268 |
| **Total/average** | **537** | **17974** | **227** | **18784** | **154** | **25556** | **68** | **22664** | **113** | **13872** | **186** | **11647** |

Appendix Table 3.7.9: Reasons provided by households who did not save money in 2009 E.C. by Zones

| | Administration zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mekelle | | Southern | | N.Western | | Western | | Eastern | | Central | |
| **Reasons** | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Do not have money to save | 1000 | 94.07 | 461 | 96.65 | 181 | 90.95 | 129 | 93.48 | 323 | 92.02 | 485 | 93.99 |
| No organization save money in | 3 | 0.28 | 3 | 0.65 | - | - | - | - | - | - | 1 | 0.19 |
| Difficult to withdraw it | 3 | 0.28 | - | - | - | - | - | - | 4 | 1.14 | 2 | 0.39 |
| I prefer to save in kind | 17 | 1.60 | 7 | 1.47 | 8 | 4.02 | 5 | 3.62 | 8 | 2.28 | 14 | 2.71 |
| If I saved, others will ask me for money | 1 | 0.09 | - | - | 1 | 0.50 | - | - | - | - | 1 | 0.19 |
| Others | 39 | 3.67 | 6 | 1.26 | 9 | 4.52 | 4 | 2.90 | 16 | 4.56 | 13 | 2.52 |
| **Total/average** | **1063** | **100** | **477** | **100** | **199** | **100** | **138** | **100** | **351** | **100** | **516** | **100** |

## Infant areas

Appendix Table 3.7.1: Distribution of responses of surveyed households on credit (past year) by administration zone

| **Credit status** | Administration zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| No | 280 | 76.71 | 386 | 84.46 | - | - | 151 | 82.97 | 71 | 77.17 | - | - |
| Yes | 85 | 23.29 | 71 | 15.54 | 50 | 100 | 31 | 17.03 | 21 | 22.83 | 55 | 100 |
| **Total** | **365** | **100** | **457** | **100** | **50** | **100** | **182** | **100** | **92** | **100** | **55** | **100** |

Appendix Table 3.7.2: Sources of loans for the surveyed households by administrative zones

| **Loan source** | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| DECSI | 55 | 66.27 | 42 | 60.87 | 37 | 74.00 | 23 | 74.19 | 15 | 71.41 | 26 | 47.27 |
| Other Micro Finance Institutions | 11 | 13.25 | 14 | 20.29 | 3 | 6.00 | 3 | 9.68 | 3 | 14.29 | 7 | 12.73 |
| Farmers' Cooperative | 1 | 1.20 | 1 | 1.45 | 1 | 2.00 | 1 | 3.23 | - | - | 6 | 10.91 |
| Banks | 1 | 1.20 | 1 | 1.45 | - | - | - | - | - | - | 1 | 1.82 |
| Community Credit Associations | 3 | 3.61 | 4 | 5.80 | 1 | 2.00 | - | - | 3 | 14.29 | 5 | 9.09 |
| Money lenders | - | - | - | - | - | - | - | - | - | - | - | - |
| Family or friends | 10 | 12.05 | 6 | 8.70 | 7 | 14.00 | 4 | 12.90 | - | - | 10 | 18.18 |
| Other | 1 | 1.20 | 1 | 1.45 | 1 | 2.00 | - | - | - | - | - | - |
| I do not know | 1 | 1.20 | - | - | - | - | - | - | - | - | - | |
| **Total** | **83** | **100** | **69** | **100** | | **100** | **31** | **100** | **21** | **100** | **55** | **100** |

Appendix Table 3.7.3: Collateral related responses of surveyed households

| | **Responses** | | | | | |
|---|---|---|---|---|---|---|
| **Zones** | **No** | **%** | **Yes** | **%** | **Total** | **%** |
| Central | 4 | 1.50 | 44 | 16.54 | 48 | 18.05 |
| Eastern | 11 | 4.14 | 50 | 18.80 | 61 | 22.93 |
| N.Western | 20 | 7.52 | 30 | 11.28 | 50 | 18.80 |
| Southern | 14 | 5.26 | 17 | 6.39 | 31 | 11.65 |
| South East | 8 | 3.01 | 13 | 4.89 | 21 | 7.89 |
| Western | 24 | 9.02 | 31 | 11.65 | 55 | 20.68 |
| **Total** | **81** | **30.45** | **185** | **69.55** | **266** | **100** |

Appendix Table 3.7.4: Average loan amount, collateral and loan repayment periods

| **Loan source** | **Administration zones** | | | | | |
|---|---|---|---|---|---|---|
| | Central | Eastern | N.Western | Southern | South East | Western |
| Average loan amount (birr) | 43766 | 32958 | 27786 | 40639 | 15715 | 28890 |
| Estimated collateral property value (birr) | 219441 | 230950 | 185209 | 124541 | 117418 | 73905 |
| Loan repayment period (months) | 30.58 | 28.75 | 25.73 | 25.28 | 26.24 | 14.67 |

Appendix Table 3.7.5: Responses of surveyed households on areas of loan utilization by zones

| **Areas of loan utilization** | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Start a new business | 27 | 44.58 | 26 | 38.24 | 12 | 24.00 | 6 | 19.35 | 5 | 23.81 | 11 | 20.00 |
| Buy consumer durables | 7 | 8.43 | 8 | 11.76 | 10 | 20.00 | - | - | 3 | 14.29 | 5 | 9.09 |
| Travel expenses | 1 | 1.20 | 2 | 2.94 | 2 | 4.00 | - | - | 1 | 4.76 | 6 | 10.91 |
| Food | 8 | 9.64 | 9 | 13.24 | 6 | 12.00 | 6 | 19.35 | 5 | 23.81 | 7 | 12.73 |
| Medical needs | - | - | 1 | 1.47 | - | - | - | - | - | - | - | - |
| School fees | 1 | 1.20 | 1 | 1.47 | - | - | - | - | - | - | - | - |
| Marriage | - | - | - | - | 1 | 2.00 | - | - | - | - | 1 | 1.82 |
| Burial or funeral | - | - | - | - | - | - | - | - | - | - | - | - |
| Other ceremony | - | - | - | - | - | - | 1 | 3.23 | - | - | 1 | 1.82 |
| Repay other loan | - | - | - | - | 1 | 2.00 | 1 | 3.23 | 1 | 4.76 | 3 | 5.45 |
| Buy livestock | 8 | 9.64 | 8 | 11.76 | 9 | 18.00 | 9 | 29.03 | 4 | 19.05 | 3 | 5.45 |
| Build a house | 17 | 20.48 | 7 | 10.29 | 5 | 10.00 | 5 | 16.13 | 2 | 9.52 | - | - |
| Pay rents or taxes | - | - | - | - | - | - | - | - | - | - | 3 | 5.45 |
| Pay for hired labour | - | - | - | - | - | - | - | - | - | - | 7 | 12.73 |
| Others | 4 | 4.82 | 6 | 8.82 | 4 | 8.00 | 3 | 9.68 | - | - | 8 | 14.55 |
| **Total** | **83** | **100** | **68** | **100** | **50** | **100** | **31** | **100** | **21** | **100** | **55** | **100** |

Appendix Table 3.7.6: Responses on equb and edir membership

| | **Equb membership** | | | | | | **Edir membership** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Zones** | **No** | **%** | **Yes** | **%** | **Total** | **%** | **No** | **%** | **Yes** | **%** | **Total** | **%** |
| Central | 288 | 17.12 | 77 | 4.58 | 365 | 21.70 | 314 | 18.66 | 51 | 3.03 | 365 | 21.69 |
| Eastern | 379 | 22.53 | 77 | 4.58 | 456 | 27.11 | 303 | 18.00 | 153 | 9.09 | 456 | 27.09 |
| N.Western | 275 | 16.35 | 34 | 2.02 | 309 | 18.37 | 305 | 18.12 | 4 | 0.24 | 309 | 18.36 |
| Southern | 134 | 7.97 | 49 | 2.91 | 183 | 10.88 | 102 | 6.06 | 81 | 4.81 | 183 | 10.87 |
| South East | 77 | 4.58 | 15 | 0.89 | 92 | 5.47 | 68 | 4.04 | 24 | 1.43 | 92 | 5.47 |
| Western | 244 | 14.51 | 33 | 1.96 | 277 | 16.47 | 275 | 16.34 | 3 | 0.18 | 278 | 16.52 |
| **Total** | **1397** | **83.06** | **285** | **16.94** | **1682** | **100** | **1367** | **81.22** | **316** | **18.78** | **1683** | **100** |

Appendix Table 3.7.7: Response of households who saved money in 2009 E.C. by zones

| | Administration zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| **Responses** | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| No | 281 | 76.99 | 373 | 81.80 | 262 | 85.06 | 144 | 78.69 | 75 | 82.42 | 224 | 80.87 |
| Yes | 84 | 23.01 | 83 | 18.20 | 46 | 14.94 | 39 | 21.31 | 16 | 17.58 | 53 | 19.13 |
| **Total** | **365** | **100** | **456** | **100** | **308** | **100** | **183** | **100** | **91** | **100** | **277** | **100** |

Appendix Table 3.7.8: Average saving of households who saved money in 2009 E.C.

| | Administration zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| **Saving areas** | No. | Average | No. | Average | No. | Average | No. | Average | No. | Average | No. | Average |
| Own home | 2 | 23000 | 2 | 9000 | 3 | 8833 | 3 | 8667 | 3 | 3667 | - | - |
| DECSI | 27 | 23235 | 29 | 19712 | 11 | 6818 | 7 | 14900 | 6 | 8633 | 12 | 36792 |
| Cooperatives | 14 | 4492 | 6 | 3023 | 1 | 19200 | 8 | 7103 | 2 | 5850 | 5 | 2559 |
| Friends | 2 | 36413 | 2 | 200000 | 1 | 200 | - | - | - | - | - | - |
| Commercial banks | 39 | 34315 | 40 | 26325 | 30 | 32700 | 21 | 32862 | 5 | 18520 | 36 | 51442 |
| **Total/average** | **84** | **24291** | **79** | **51612** | **46** | **13550** | **39** | **12706** | **16** | **7334** | **53** | **18159** |

Appendix Table 3.7.9: Reasons provided by households who did not save money in 2009 E.C. by Zones

| | Administration zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| **Reasons** | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Do not have money to save | 265 | 94.31 | 357 | 95.71 | 244 | 93.13 | 143 | 99.31 | 73 | 97.33 | 208 | 92.86 |
| No organization to save money in | - | - | - | - | - | - | - | - | - | - | - | - |
| Difficult to withdraw it | 2 | 0.71 | 1 | 0.27 | - | - | 1 | 0.69 | 1 | 1.33 | 1 | 0.45 |
| I prefer to save in kind | 9 | 3.20 | 10 | 2.68 | 8 | 3.05 | - | - | 1 | 1.33 | 11 | 4.91 |
| If I saved, others will ask me for money | - | - | 1 | 0.27 | 3 | 1.15 | - | - | - | - | - | - |
| Others | 5 | 1.78 | 4 | 1.07 | 7 | 2.67 | - | - | - | - | 4 | 1.79 |
| **Total/average** | **281** | **100** | **373** | **100** | **262** | **100** | **144** | **100** | **75** | **100** | **224** | **100** |

Appendix Table 3.7.10: Credit experience of surveyed households from Dedebit Credit and Saving Institution (DECSI)

| Zones | Responses | | | | Total | % |
|---|---|---|---|---|---|---|
| | No | % | Yes | % | | |
| Central | 273 | 16.25 | 92 | 5.48 | 365 | 21.73 |
| Eastern | 379 | 22.56 | 75 | 4.46 | 454 | 27.02 |
| N.Western | 200 | 11.90 | 108 | 6.43 | 308 | 18.33 |
| Southern | 149 | 8.87 | 34 | 2.02 | 183 | 10.89 |
| South East | 62 | 3.69 | 30 | 1.79 | 92 | 5.48 |
| Western | 180 | 10.71 | 98 | 5.83 | 278 | 16.55 |
| **Total** | **1243** | **73.99** | **437** | **26.01** | **1680** | **100** |

Appendix Table 3.7.11: Responses of surveyed households on types of Dedebit loan

| Type of loan | Administration zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Group loan only | 26 | 28.26 | 20 | 26.67 | 43 | 39.81 | 6 | 17.65 | 9 | 30 | 66 | 67.35 |
| Individual loan | 64 | 69.57 | 50 | 66.67 | 62 | 57.41 | 28 | 82.35 | 18 | 60 | 29 | 29.59 |
| Group loan package | 1 | 1.09 | 1 | 1.33 | 2 | 1.85 | - | - | 2 | 6.67 | 3 | 3.06 |
| Individual loan package | 1 | 1.09 | 4 | 5.33 | 1 | 0.93 | - | - | 1 | 3.33 | - | - |
| **Total** | **92** | **100** | **75** | **100** | **108** | **100** | **34** | **100** | **30** | **100** | **98** | **100** |

Appendix Table 3.7.12: Responses of surveyed households on Dedebit group loan utilization by zones

| **Areas of Dedebit loan utilization** | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| To buy ox | 1 | 3.70 | 2 | 9.52 | 11 | 24.44 | 2 | 33.33 | 1 | 9.09 | 4 | 5.80 |
| Milk cow | - | - | 1 | 4.76 | 7 | 15.56 | 1 | 16.67 | 1 | 9.09 | - | - |
| Other cattle | - | - | - | - | 3 | 6.67 | - | - | - | - | 3 | 4.35 |
| Sheep and goat | 2 | 7.41 | - | - | 7 | 15.56 | - | - | 2 | 18.18 | 3 | 4.35 |
| Pack animal | - | - | - | - | - | - | - | - | 1 | 9.09 | - | - |
| Poultry | - | - | - | - | - | - | - | - | - | - | - | - |
| Bee keeping | - | - | - | - | - | - | - | - | 1 | 9.09 | - | - |
| Trade | 9 | 33.33 | 6 | 28.57 | 4 | 8.89 | - | - | - | - | 7 | 10.14 |
| Handcraft | - | - | - | - | - | - | - | - | - | - | - | - |
| Tilfi | 1 | 3.70 | - | - | - | - | - | - | - | - | - | - |
| Chemical fertilizer | - | - | - | - | - | - | - | - | - | - | 6 | 8.70 |
| Improved seeds | - | - | - | - | - | - | - | - | - | - | 5 | 7.25 |
| Pesticides | - | - | - | - | 1 | 2.22 | - | - | - | - | 3 | 4.35 |
| Household consumption | 5 | 18.52 | 6 | 28.57 | 3 | 6.67 | - | - | 2 | 18.18 | 7 | 10.14 |
| Health expenses | 1 | 3.70 | 1 | 4.76 | 2 | 4.44 | 1 | 16.67 | - | - | 2 | 2.90 |
| Ceremonies | - | - | - | - | - | - | - | - | - | - | - | - |
| Education expenses | - | - | - | - | 1 | 2.22 | - | - | - | - | 2 | 2.90 |
| Clothes | - | - | - | - | 2 | 4.44 | - | - | - | - | 2 | 2.90 |
| House rent | - | - | 1 | 4.76 | - | - | - | - | - | - | 1 | 1.45 |
| Others | 8 | 29.63 | 4 | 19.05 | 4 | 8.89 | 2 | 33.33 | 3 | 27.27 | 24 | 34.78 |
| **Total** | **27** | **100** | **21** | **100** | **45** | **100** | **6** | **100** | **11** | **100** | **69** | **100** |

Appendix Table 3.7.13: Responses of surveyed households on Dedebit loan repayment self-evaluation by zones

| **Loan repayment self-evaluation** | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Always pay on time | 80 | 86.96 | 61 | 81.33 | 93 | 86.11 | 29 | 85.29 | 24 | 80 | 59 | 60.20 |
| Mostly on time but sometimes delayed | 7 | 7.61 | 9 | 12 | 11 | 10.19 | 4 | 11.76 | 4 | 13.33 | 28 | 28.57 |
| Mostly delayed but sometimes on time | 1 | 1.09 | 2 | 2.67 | 1 | 0.93 | - | - | 2 | 6.67 | 2 | 2.04 |
| Mostly delayed | 3 | 3.26 | 1 | 1.33 | 2 | 1.85 | 1 | 2.94 | - | - | 8 | 8.16 |
| Unable to pay | 1 | 1.09 | 1 | 1.33 | 1 | 0.93 | - | - | - | - | 1 | 1.02 |
| Others | - | - | 1 | 1.33 | - | - | - | - | - | - | - | - |
| **Total** | **92** | **100** | **75** | **100** | **108** | **100** | **34** | **100** | **30** | **100** | **98** | **100** |

Appendix Table 3.7.14: Evaluation of surveyed households on the importance of Dedebit loan by zones

| **Importance of Dedebit loan** | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Highly important | 56 | 60.87 | 23 | 30.67 | 32 | 29.63 | 17 | 50 | 19 | 63.33 | 31 | 31.63 |
| Very important | 17 | 18.48 | 32 | 42.67 | 39 | 36.11 | 7 | 20.59 | 9 | 30 | 27 | 27.55 |
| Important | 12 | 13.04 | 16 | 21.33 | 30 | 27.78 | 8 | 23.53 | 2 | 6.67 | 35 | 35.71 |
| Somewhat important | 2 | 2.17 | 3 | 4 | 2 | 1.85 | 2 | 5.88 | - | - | 2 | 2.04 |
| Not important or harmful | 2 | 2.17 | - | - | 3 | 2.78 | - | - | - | - | 2 | 2.04 |
| Not important | 3 | 3.26 | 1 | 1.33 | 2 | 1.85 | - | - | - | - | 1 | 1.02 |
| **Total** | **92** | **100** | **75** | **100** | **108** | **100** | **34** | **100** | **30** | **100** | **98** | **100** |

Appendix Table 3.7.15: Round trip distance and time taken to the agricultural product market

| Distance and time | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | Mean | No. | Mean | No. | Mean | No. | Mean | No. | Mean | No. | Mean |
| Round trip distance to the market (km.) | 24 | 16 | 55 | 15.95 | 125 | 18.97 | 71 | 16.94 | 24 | 14.58 | 163 | 16.09 |
| Round trip time taken on foot (hours) | 24 | 0.64 | 54 | 0.57 | 124 | 2.09 | 70 | 1.20 | 25 | 0.67 | 164 | 0.97 |
| Round trip time taken by car (hours) | 16 | 0.81 | 41 | 0.34 | 118 | 0.35 | 51 | 0.44 | 13 | 0.77 | 151 | 0.37 |

Appendix Table 3.7.16: Means of transportation to the market place

| **Transportation type** | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Human power | 299 | 81.92 | 304 | 69.89 | 146 | 47.25 | 99 | 55.31 | 63 | 69.23 | 94 | 33.81 |
| Pack animals | 9 | 2.47 | 47 | 10.80 | 97 | 31.39 | 26 | 14.53 | 10 | 10.99 | 67 | 24.10 |
| Vehicle | 37 | 10.14 | 61 | 14.02 | 55 | 17.80 | 35 | 19.55 | 15 | 16.48 | 100 | 35.97 |
| Others | 20 | 5.48 | 23 | 5.29 | 11 | 3.56 | 19 | 10.61 | 3 | 3.30 | 17 | 6.12 |
| **Total** | **365** | **100** | **435** | **100** | **109** | **100** | **179** | **100** | **91** | **100** | **278** | **100** |

Appendix Table 3.7.17: Type of roads to the nearest town

| **Road type** | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Asphalt road | 95 | 26.03 | 173 | 39.14 | 95 | 30.84 | 93 | 51.10 | 54 | 59.34 | 176 | 63.54 |
| Stone road | 5 | 1.37 | 10 | 2.26 | 5 | 1.62 | 1 | 0.55 | - | - | - | - |
| Gravel road | 85 | 23.29 | 75 | 16.97 | 65 | 21.10 | 43 | 23.63 | 21 | 23.08 | 20 | 7.22 |
| Soil road | 179 | 49.04 | 182 | 41.18 | 138 | 44.81 | 44 | 24.18 | 16 | 17.58 | 80 | 28.88 |
| Others | 1 | 0.27 | 2 | 0.45 | 5 | 1.62 | 1 | 0.55 | - | - | 1 | 0.36 |
| **Total** | **365** | **100** | **442** | **100** | **308** | **100** | **182** | **100** | **91** | **100** | **277** | **100** |

Table 3.7.18: Road service convenience to and from Kushet during rainy season

| **Road services** | | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Very good access for any vehicles | | 176 | 48.22 | 233 | 52.71 | 130 | 42.21 | 134 | 73.63 | 73 | 79.35 | 200 | 72.20 |
| Reasonable access for any vehicles | | 86 | 23.56 | 96 | 21.72 | 55 | 17.86 | 31 | 17.03 | 7 | 7.61 | 14 | 5.05 |
| Very good access for trucks & buses | | 21 | 5.75 | 24 | 5.43 | 13 | 4.22 | 9 | 4.95 | 4 | 4.35 | 8 | 2.89 |
| Reasonable access for trucks & buses | | 24 | 6.58 | 37 | 8.37 | 35 | 11.36 | 5 | 2.75 | 4 | 4.35 | 8 | 2.89 |
| Access for cart/pack animals | | 7 | 1.92 | 6 | 1.36 | 13 | 4.22 | 1 | 0.55 | 2 | 2.17 | 10 | 3.61 |
| Only on foot | | 51 | 13.97 | 46 | 10.41 | 62 | 20.13 | 2 | 1.10 | 2 | 2.17 | 37 | 13.36 |
| | **Total** | **365** | **100** | **442** | **100** | **308** | **100** | **182** | **100** | **92** | **100** | **277** | **100** |

Table 3.7.20: Road service convenience to and from Kushet during dry season

| **Road services** | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Very good access for any vehicles | 158 | 43.29 | 234 | 53.06 | 139 | 45.13 | 128 | 70.33 | 70 | 76.09 | 188 | 67.87 |
| Reasonable access for any vehicles | 100 | 27.40 | 94 | 21.32 | 58 | 18.83 | 27 | 14.84 | 11 | 11.96 | 25 | 9.03 |
| Very good access for trucks & buses | 33 | 9.04 | 22 | 4.99 | 10 | 3.25 | 15 | 8.24 | 2 | 2.17 | 7 | 2.53 |
| Reasonable access for trucks & buses | 19 | 5.21 | 39 | 8.84 | 34 | 11.04 | 7 | 3.85 | 5 | 5.43 | 11 | 3.97 |
| Access for cart/pack animals | 8 | 2.19 | 7 | 1.59 | 8 | 2.60 | 1 | 0.55 | 1 | 1.09 | 10 | 3.61 |
| Only on foot | 47 | 12.88 | 45 | 10.20 | 59 | 19.16 | 4 | 2.20 | 3 | 3.26 | 36 | 13 |
| **Total** | **365** | **100** | **441** | **100** | **308** | **100** | **182** | **100** | **92** | **100** | **277** | **100** |

Table 3.7.21: Frequency of group and individual meetings with extension agents in the last rainy and dry season

| **Seasons (group meeting)** | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | Mean | No. | Mean | No. | Mean | No. | Mean | No. | Mean | No. | Mean |
| Rainy season | 35 | 2.2 | 70 | 2.2 | 115 | 2.23 | 26 | 3.15 | 12 | 6.58 | 35 | 2.77 |
| Dry season | 28 | 2.43 | 66 | 2.06 | 101 | 2.78 | 28 | 2.79 | 11 | 5 | 27 | 2.85 |
| **Seasons (individual meeting)** | | | | | | | | | | | | |
| Rainy season | 1 | 2 | - | - | 6 | 2.17 | 1 | 2 | - | - | 2 | 3.5 |
| Dry season | 29 | 2.07 | 62 | 1.95 | 106 | 2.42 | 27 | 2.74 | 10 | 5.9 | 27 | 3.22 |

Table 3.7.22: Purpose of group meeting with extension agents in the last rainy and dry season

| **Purpose** | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Advice on chemical fertilizer utilization | 39 | 86.67 | 69 | 87.34 | 111 | 85.38 | 20 | 66.67 | 13 | 86.67 | 33 | 71.74 |
| advice on irrigation | - | - | 2 | 2.53 | 2 | 1.54 | - | - | - | - | - | - |
| Advice on new improved seeds utilization | - | - | 1 | 1.27 | 1 | 0.77 | 4 | 13.33 | - | - | 2 | 4.35 |
| Advice on epidemic diseases | - | - | 1 | 1.27 | - | - | - | - | - | - | - | - |
| Advice on insect infestation | - | - | 1 | 1.27 | 2 | 1.54 | 1 | 3.33 | - | - | 1 | 2.17 |
| Advice on problems related to ecosystem | - | - | - | - | - | - | 1 | 3.33 | - | - | - | - |
| Advice on input and output market | - | - | - | - | - | - | - | - | - | - | - | - |
| Advice on credit services | - | - | - | - | - | - | - | - | - | - | - | - |
| Advice on other general issues | - | - | 4 | 5.06 | 5 | 3.85 | 3 | 10 | - | - | 1 | 2.17 |
| Other advices | 6 | 13.33 | 1 | 1.27 | 9 | 6.92 | 1 | 3.33 | 2 | 13.33 | 9 | 19.57 |
| | **45** | **100** | **79** | **100** | **130** | **100** | **30** | **100** | **15** | **100** | **46** | **100** |

Table 3.7.23: Purpose of individual meeting with extension agents in the last rainy and dry season

| **Purpose** | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Advice on chemical fertilizer utilization | 19 | 42.22 | 36 | 48 | 75 | 57.69 | 10 | 33.33 | 8 | 53.33 | 14 | 30.43 |
| advice on irrigation | 1 | 2.22 | 6 | 8 | 3 | 2.31 | 6 | 20 | - | - | 2 | 4.35 |
| Advice on new improved seeds utilization | 11 | 24.44 | 22 | 29.33 | 12 | 9.23 | 6 | 20 | - | - | 7 | 15.22 |
| Advice on epidemic diseases | 1 | 2.22 | 2 | 2.67 | 2 | 1.54 | 1 | 3.33 | - | - | 2 | 4.35 |
| Advice on insect infestation | 1 | 2.22 | 1 | 1.33 | 6 | 4.62 | 1 | 3.33 | - | - | 3 | 6.52 |
| Advice on problems related to ecosystem | - | - | - | - | 1 | 0.77 | - | - | - | - | - | - |
| Advice on input and output market | - | - | - | - | - | - | - | - | - | - | - | - |
| Advice on credit services | - | - | - | - | 1 | 0.77 | - | - | - | - | 1 | 2.17 |
| Advice on other general issues | 1 | 2.22 | 5 | 6.67 | 16 | 12.31 | 4 | 13.33 | 4 | 26.67 | 2 | 4.35 |
| Other advices | 11 | 24.44 | 3 | 4 | 14 | 10.77 | 2 | 6.67 | 3 | 20 | 15 | 32.61 |
| **Total** | **45** | **100** | **75** | **100** | **130** | **100** | **30** | **100** | **15** | **100** | **46** | **100** |

**Rural areas**

Appendix Table 3.7.1: Distribution of responses of surveyed households on credit (past year) by administration zone

| **Credit status** | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| No | 1636 | 89.69 | 1093 | 90.03 | 1 | 0.59 | 921 | 84.57 | 582 | 85.34 | 3 | 3.57 |
| Yes | 188 | 10.31 | 121 | 9.97 | 169 | 99.41 | 168 | 15.43 | 100 | 14.66 | 81 | 96.43 |
| **Total** | **1824** | **100** | **1214** | **100** | **170** | **100** | **1089** | **100** | **682** | **100** | **84** | **100** |

Appendix Table 3.7.2: Sources of loans for the surveyed households by administrative zones

| **Loan source** | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| DECSI | 99 | 54.40 | 62 | 53.45 | 109 | 64.50 | 115 | 70.12 | 68 | 69.39 | 38 | 46.91 |
| Other Micro Finance Institutions | 16 | 8.79 | 10 | 8.62 | 20 | 11.83 | 12 | 7.32 | 9 | 9.18 | 8 | 9.88 |
| Farmers' Cooperative | 17 | 9.34 | 7 | 6.03 | 9 | 5.33 | 8 | 4.88 | 1 | 1.02 | 4 | 4.94 |
| Banks | 3 | 1.65 | 3 | 2.59 | 2 | 1.18 | - | - | - | - | 1 | 1.23 |
| Community Credit Associations | 21 | 11.54 | 11 | 9.48 | 6 | 3.55 | 14 | 8.54 | 12 | 12.24 | 4 | 4.94 |
| Money lenders | 2 | 1.10 | 1 | 0.86 | - | - | - | - | - | - | 2 | 2.47 |
| Family or friends | 21 | 11.54 | 19 | 16.38 | 22 | 13.02 | 12 | 7.32 | 6 | 6.12 | 23 | 28.40 |
| Other | - | - | 2 | 1.72 | 1 | 0.59 | 2 | 1.22 | 1 | 1.02 | 1 | 1.23 |
| I do not know | 3 | 1.65 | 1 | 0.86 | - | - | 1 | 0.61 | 1 | 1.02 | - | - |
| **Total** | **182** | **100** | **116** | **100** | **169** | **100** | **164** | **100** | **98** | **100** | **81** | **100** |

Appendix Table 3.7.3: Collateral related responses of surveyed households

| Zones | Responses | | | | Total | % |
|---|---|---|---|---|---|---|
| | No | % | Yes | % | | |
| Central | 44 | 5.16 | 171 | 20.07 | 215 | 25.23 |
| Eastern | 31 | 3.64 | 94 | 11.03 | 125 | 14.67 |
| N.Western | 77 | 9.04 | 92 | 10.80 | 169 | 19.83 |
| Southern | 105 | 12.32 | 59 | 6.92 | 164 | 19.25 |
| South East | 52 | 6.10 | 46 | 5.40 | 98 | 11.50 |
| Western | 43 | 5.05 | 38 | 4.46 | 81 | 9.51 |
| **Total** | **352** | **41.31** | **500** | **58.69** | **852** | **100** |

Appendix Table 3.7.4: Average loan amount, collateral and loan repayment periods

| Loan source | Administration zones | | | | | |
|---|---|---|---|---|---|---|
| | Central | Eastern | N.Western | Southern | South East | Western |
| Average loan amount (birr) | 9652 | 9167 | 16303 | 11176 | 11646 | 29311 |
| Estimated collateral property value (birr) | 57523 | 25900 | 94252 | 27867 | 39274 | 131771 |
| Loan repayment period (months) | 25.52 | 23.75 | 24.14 | 21.68 | 29.42 | 15.55 |

Appendix Table 3.7.5: Responses of surveyed households on areas of loan utilization by zones

| **Areas of loan utilization** | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Start a new business | 31 | 17.13 | 21 | 18.10 | 31 | 18.34 | 32 | 19.75 | 21 | 21.43 | 12 | 14.81 |
| Buy consumer durables | 16 | 8.84 | 13 | 11.21 | 20 | 11.83 | 9 | 5.56 | 9 | 9.18 | 11 | 13.58 |
| Travel expenses | 9 | 4.97 | 4 | 3.45 | 6 | 3.55 | 3 | 1.85 | - | - | 3 | 3.70 |
| Food | 59 | 32.60 | 32 | 27.59 | 31 | 18.34 | 35 | 21.60 | 19 | 19.39 | 11 | 13.58 |
| Medical needs | - | - | 2 | 1.72 | 1 | 0.59 | 3 | 1.85 | - | - | 2 | 2.47 |
| School fees | 2 | 1.10 | 2 | 1.72 | 5 | 2.96 | 2 | 1.23 | 1 | 1.02 | 1 | 1.23 |
| Marriage | 2 | 1.10 | - | - | 1 | 0.59 | 2 | 1.23 | - | - | 2 | 2.47 |
| Burial or funeral | - | - | - | - | - | - | - | - | - | - | - | - |
| Other ceremony | 1 | 0.55 | - | - | 2 | 1.18 | - | - | - | - | - | - |
| Repay other loan | 2 | 1.10 | - | - | 11 | 6.51 | 5 | 3.09 | 1 | 1.02 | 4 | 4.94 |
| Buy livestock | 44 | 24.31 | 35 | 30.17 | 43 | 25.44 | 48 | 29.63 | 29 | 29.59 | 11 | 13.58 |
| Build a house | 12 | 6.63 | 4 | 3.45 | 10 | 5.92 | 15 | 9.26 | 14 | 14.29 | 4 | 4.94 |
| Pay rents or taxes | - | - | - | - | 2 | 1.18 | - | - | - | - | 4 | 4.94 |
| Pay for hired labour | - | - | - | - | - | - | - | - | - | - | 4 | 4.94 |
| Others | 3 | 1.66 | 3 | 2.59 | 6 | 3.55 | 8 | 4.94 | 4 | 4.08 | 12 | 14.81 |
| **Total** | **181** | **100** | **116** | **100** | **169** | **100** | **162** | **100** | **98** | **100** | **81** | **100** |

Appendix Table 3.7.6: Responses on equb and edir membership

| | **Equb membership** | | | | | | **Edir membership** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Zones** | **No** | **%** | **Yes** | **%** | **Total** | **%** | **No** | **%** | **Yes** | **%** | **Total** | **%** |
| Central | 1748 | 27.18 | 76 | 1.18 | 1824 | 28.36 | 1763 | 27.38 | 60 | 0.93 | 1823 | 28.32 |
| Eastern | 1167 | 18.14 | 46 | 0.72 | 1213 | 18.86 | 932 | 14.48 | 282 | 4.38 | 1214 | 18.86 |
| N.Western | 1086 | 16.88 | 82 | 1.27 | 1168 | 18.16 | 1149 | 17.85 | 21 | 0.33 | 1170 | 18.17 |
| Southern | 973 | 15.13 | 114 | 1.77 | 1087 | 16.90 | 763 | 11.85 | 324 | 5.03 | 1087 | 16.88 |
| South East | 616 | 9.58 | 66 | 1.03 | 682 | 10.60 | 569 | 8.84 | 113 | 1.76 | 682 | 10.59 |
| Western | 421 | 6.55 | 37 | 0.58 | 458 | 7.12 | 461 | 7.16 | 1 | 0.02 | 462 | 7.18 |
| **Total** | **6011** | **93.45** | **421** | **6.55** | 6432 | **100** | **5637** | **87.56** | **801** | **12.44** | **6438** | **100** |

Appendix Table 3.7.7: Response of households who saved money in 2009 E.C. by zones

| | Administration zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| **Responses** | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| No | 1668 | 91.55 | 1119 | 92.17 | 1026 | 87.84 | 901 | 82.81 | 565 | 82.84 | 404 | 87.64 |
| Yes | 154 | 8.45 | 95 | 7.83 | 142 | 12.16 | 187 | 17.19 | 117 | 17.16 | 57 | 12.16 |
| **Total** | **1822** | **100** | **1214** | **100** | **1168** | **100** | **1088** | **100** | **682** | **100** | **461** | **100** |

Appendix Table 3.7.8: Average saving of households who saved money in 2009 E.C.

| | Administration zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| **Saving areas** | No. | Average | No. | Average | No. | Average | No. | Average | No. | Average | No. | Average |
| Own home | 1 | 2000 | 3 | 3400 | 5 | 4520 | 29 | 5486 | 10 | 3520 | 5 | 8200 |
| DECSI | 43 | 10566 | 18 | 12331 | 50 | 8262 | 54 | 10807 | 32 | 2219 | 12 | 25733 |
| Cooperatives | 40 | 1346 | 30 | 1599 | 21 | 4928 | 44 | 3228 | 29 | 1703 | 9 | 6501 |
| Friends | 1 | 1200 | - | - | 2 | 5900 | 1 | 960 | 1 | 2000 | 2 | 60000 |
| Commercial banks | 62 | 21160 | 38 | 15895 | 64 | 15665 | 54 | 22765 | 42 | 24240 | 29 | 40614 |
| **Total/average** | **147** | **7254** | **89** | **6645** | **142** | **7855** | **182** | **8649** | **114** | **6736** | **57** | **28210** |

Appendix Table 3.7.9: Reasons provided by households who did not save money in 2009 E.C. by Zones

| | Administration zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| **Reasons** | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Do not have money to save | 1650 | 98.92 | 1101 | 98.48 | 989 | 96.39 | 874 | 97.11 | 549 | 97.17 | 380 | 94.06 |
| No organization to save money in | - | - | - | - | - | - | 1 | 0.11 | 1 | 0.18 | 1 | 0.25 |
| Difficult to withdraw it | - | - | 3 | 0.27 | 2 | 0.19 | 2 | 0.22 | 2 | 0.35 | 2 | 0.50 |
| I prefer to save in kind | 17 | 1.02 | 8 | 0.72 | 23 | 2.24 | 8 | 0.89 | 10 | 1.77 | 18 | 4.46 |
| If I saved, others will ask me for money | - | - | 1 | 0.09 | 3 | 0.29 | 1 | 0.11 | - | - | 1 | 0.25 |
| Others | 1 | 0.06 | 5 | 0.45 | 9 | 0.88 | 14 | 1.56 | 3 | 0.53 | 2 | 0.50 |
| **Total/average** | **1668** | **100** | **1118** | **100** | **1026** | **100** | **900** | **100** | **565** | **100** | **404** | **100** |

Appendix Table 3.7.10: Credit experience of surveyed households from Dedebit Credit and Saving Institution (DECSI)

| Zones | Responses | | | | Total | % |
|---|---|---|---|---|---|---|
| | No | % | Yes | % | | |
| Central | 1592 | 24.73 | 230 | 3.57 | 1822 | 28.31 |
| Eastern | 1111 | 17.26 | 103 | 1.60 | 1214 | 18.86 |
| N.Western | 847 | 13.16 | 324 | 5.03 | 1171 | 18.19 |
| Southern | 875 | 13.59 | 211 | 3.28 | 1086 | 16.87 |
| South East | 485 | 7.53 | 197 | 3.06 | 682 | 10.60 |
| Western | 358 | 5.56 | 104 | 1.62 | 462 | 7.18 |
| **Total** | **5268** | **81.84** | **1169** | **18.16** | **6437** | **100** |

Appendix Table 3.7.11: Responses of surveyed households on types of Dedebit loan

| Type of loan | Administration zones | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Group loan only | 61 | 26.52 | 35 | 33.98 | 119 | 36.73 | 71 | 33.65 | 84 | 42.64 | 67 | 64.42 |
| Individual loan | 150 | 65.22 | 62 | 60.19 | 192 | 59.26 | 124 | 58.77 | 94 | 47.72 | 31 | 29.81 |
| Group loan package | 13 | 5.65 | 3 | 2.91 | 4 | 1.23 | 9 | 4.27 | 11 | 5.58 | 5 | 4.81 |
| Individual loan package | 6 | 2.61 | 3 | 2.91 | 9 | 2.78 | 7 | 3.32 | 8 | 4.06 | 1 | 0.96 |
| **Total** | **230** | **100** | **103** | **100** | **324** | **100** | **211** | **100** | **197** | **100** | **104** | **100** |

Appendix Table 3.7.12: Responses of surveyed households on Dedebit group loan utilization by zones

| **Areas of Dedebit loan utilization** | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| To buy ox | 27 | 36.49 | 18 | 47.37 | 36 | 29.27 | 24 | 30 | 31 | 32.63 | 19 | 26.39 |
| Milk cow | 15 | 20.27 | 2 | 5.26 | 11 | 8.94 | 12 | 15 | 23 | 24.21 | 1 | 1.39 |
| Other cattle | 3 | 4.05 | - | - | 4 | 3.25 | - | - | - | - | 2 | 2.78 |
| Sheep and goat | 2 | 2.70 | 4 | 10.53 | 16 | 13.01 | 12 | 15 | 3 | 3.16 | 1 | 1.39 |
| Pack animal | - | - | - | - | 7 | 5.69 | 4 | 5 | 4 | 4.21 | 5 | 6.94 |
| Poultry | 2 | 2.70 | - | - | 1 | 0.81 | - | - | - | - | - | - |
| Bee keeping | 3 | 4.05 | 1 | 2.63 | 1 | 0.81 | - | - | - | - | - | - |
| Trade | 5 | 6.76 | 3 | 7.89 | 10 | 8.13 | 11 | 13.75 | 6 | 6.32 | 6 | 8.33 |
| Handcraft | - | - | - | - | - | - | - | - | - | - | - | - |
| Tilfi | - | - | - | - | - | - | - | - | - | - | - | - |
| Chemical fertilizer | 2 | 2.70 | 1 | 2.63 | 5 | 4.07 | 2 | 2.50 | 2 | 2.11 | 5 | 6.94 |
| Improved seeds | 1 | 1.35 | - | - | 1 | 0.81 | - | - | 4 | 4.21 | - | - |
| Pesticides | - | - | - | - | 1 | 0.81 | - | - | - | - | 3 | 4.17 |
| Household consumption | 7 | 9.46 | 4 | 10.53 | 8 | 6.50 | 4 | 5 | 5 | 5.26 | 6 | 8.33 |
| Health expenses | - | - | - | - | - | - | 1 | 1.25 | 1 | 1.05 | 4 | 4.17 |
| Ceremonies | - | - | 1 | 2.63 | 2 | 1.63 | 1 | 1.25 | - | - | - | - |
| Education expenses | - | - | - | - | 5 | 4.07 | - | - | 1 | 1.05 | 2 | 2.78 |
| Clothes | 1 | 1.35 | 1 | 2.63 | 1 | 0.81 | - | - | - | - | - | - |
| House rent | 1 | 1.35 | - | - | 1 | 0.81 | - | - | 2 | 2.11 | 1 | 1.39 |
| Others | 5 | 6.76 | 3 | 7.89 | 13 | 10.57 | 9 | 11.25 | 13 | 13.68 | 17 | 23.61 |
| **Total** | **74** | **100** | **38** | **100** | **123** | **100** | **80** | **100** | **95** | **100** | **72** | **100** |

Appendix Table 3.7.13: Responses of surveyed households on Dedebit loan repayment self-evaluation by zones

| **Loan repayment self-evaluation** | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Always pay on time | 174 | 75.65 | 76 | 73.79 | 255 | 255 | 177 | 83.89 | 154 | 78.17 | 62 | 59.62 |
| Mostly on time but sometimes delayed | 26 | 11.30 | 14 | 13.59 | 57 | 17.59 | 19 | 9 | 37 | 18.78 | 30 | 28.85 |
| Mostly delayed but sometimes on time | 12 | 5.22 | 2 | 1.94 | 4 | 1.23 | 3 | 1.42 | 3 | 1.52 | 5 | 4.81 |
| Mostly delayed | 8 | 3.48 | 6 | 5.83 | 4 | 1.23 | 4 | 1.90 | 1 | 0.51 | 3 | 2.88 |
| Unable to pay | 8 | 3.48 | 5 | 4.85 | 2 | 0.62 | 5 | 2.37 | 1 | 0.51 | 3 | 2.88 |
| Others | 2 | 0.87 | - | - | 2 | 0.62 | 3 | 1.42 | 1 | 0.51 | 1 | 0.96 |
| **Total** | **230** | **100** | **103** | **100** | **324** | **100** | **211** | **100** | **197** | **100** | **104** | **100** |

Appendix Table 3.7.14: Evaluation of surveyed households on the importance of Dedebit loan by zones

| **Areas of Dedebit loan utilization** | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Highly important | 82 | 35.65 | 39 | 37.86 | 112 | 34.57 | 91 | 43.13 | 78 | 39.59 | 35 | 33.65 |
| Very important | 57 | 24.78 | 21 | 20.39 | 103 | 31.79 | 60 | 28.44 | 75 | 38.07 | 24 | 23.08 |
| Important | 65 | 28.26 | 29 | 28.16 | 86 | 26.54 | 53 | 25.12 | 40 | 20.30 | 30 | 28.85 |
| Somewhat important | 10 | 4.35 | 7 | 6.80 | 13 | 4.01 | 3 | 1.42 | 3 | 1.52 | 4 | 3.85 |
| Not important or harmful | 9 | 3.91 | 3 | 2.91 | 3 | 0.93 | 2 | 0.95 | 1 | 0.51 | 4 | 3.85 |
| Not important | 7 | 3.04 | 4 | 3.88 | 7 | 2.16 | 2 | 0.95 | - | - | 7 | 6.73 |
| **Total** | **230** | **100** | **103** | **100** | **324** | **100** | **211** | **100** | **197** | **100** | **104** | **100** |

Appendix Table 3.7.15: Round trip distance and time taken to the agricultural product market

| Distance and time | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | Mean | No. | Mean | No. | Mean | No. | Mean | No. | Mean | No. | Mean |
| Round trip distance to the market (km.) | 403 | 18.59 | 255 | 17.84 | 527 | 18.96 | 584 | 17.64 | 287 | 17.19 | 248 | 17.63 |
| Round trip time taken on foot (hours) | 402 | 2.15 | 258 | 1.96 | 529 | 2.35 | 585 | 1.67 | 286 | 1.94 | 247 | 1.92 |
| Round trip time taken by car (hours) | 349 | 0.43 | 224 | 0.43 | 500 | 0.36 | 537 | 0.44 | 247 | 0.36 | 227 | 0.43 |

Appendix Table 3.7.16: Means of transportation to the market place

| **Transportation type** | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Human power | 1379 | 75.64 | 763 | 62.95 | 532 | 45.43 | 488 | 44.85 | 393 | 57.71 | 178 | 38.70 |
| Pack animals | 264 | 14.48 | 276 | 22.77 | 439 | 37.49 | 287 | 26.38 | 187 | 27.46 | 142 | 30.87 |
| Vehicle | 154 | 8.45 | 147 | 12.13 | 178 | 15.20 | 288 | 26.47 | 83 | 12.19 | 119 | 25.87 |
| Others | 26 | 1.43 | 26 | 2.15 | 22 | 1.88 | 25 | 2.30 | 18 | 2.64 | 21 | 4.57 |
| **Total** | **1823** | **100** | **1212** | **100** | **1171** | **100** | **1088** | **100** | **681** | **100** | **460** | **100** |

Appendix Table 3.7.17: Type of road to the nearest town

| **Road type** | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Asphalt road | 241 | 13.21 | 200 | 16.50 | 311 | 26.56 | 218 | 20.06 | 113 | 16.57 | 194 | 42.17 |
| Stone road | 91 | 4.99 | 48 | 3.96 | 24 | 2.05 | 27 | 2.48 | 27 | 3.96 | 10 | 2.17 |
| Gravel road | 400 | 21.93 | 239 | 19.72 | 239 | 20.41 | 370 | 34.04 | 205 | 30.06 | 77 | 16.74 |
| Soil road | 1054 | 57.79 | 716 | 59.08 | 581 | 49.62 | 462 | 42.50 | 325 | 47.65 | 174 | 37.83 |
| Others | 38 | 2.08 | 9 | 0.74 | 16 | 1.37 | 10 | 0.92 | 12 | 1.76 | 5 | 1.09 |
| **Total** | **1824** | **100** | **1212** | **100** | **1171** | **100** | **1087** | **100** | **682** | **100** | **460** | **100** |

Appendix Table 3.7.18: Road service convenience to and from Kushet during rainy season

| **Road services** | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Very good access for any vehicles | 399 | 21.88 | 296 | 24.42 | 387 | 33.05 | 489 | 44.94 | 259 | 38.09 | 217 | 47.07 |
| Reasonable access for any vehicles | 573 | 31.41 | 345 | 28.47 | 201 | 17.16 | 229 | 21.05 | 172 | 25.29 | 48 | 10.41 |
| Very good access for trucks & buses | 60 | 3.29 | 54 | 4.46 | 30 | 2.56 | 37 | 3.40 | 27 | 3.97 | 8 | 1.74 |
| Reasonable access for trucks & buses | 242 | 13.27 | 171 | 14.11 | 85 | 7.26 | 101 | 9.28 | 54 | 7.94 | 33 | 7.16 |
| Access for cart/pack animals | 51 | 2.80 | 48 | 3.96 | 55 | 4.70 | 67 | 6.16 | 33 | 4.85 | 24 | 5.21 |
| Only on foot | 499 | 27.36 | 298 | 24.59 | 413 | 35.27 | 165 | 15.17 | 135 | 19.85 | 131 | 28.42 |
| **Total** | **1824** | **100** | **1212** | **100** | **1171** | **100** | **1088** | **100** | **680** | **100** | **461** | **100** |

Appendix Table 3.7.19: Road service convenience to and from Kushet during dry season

| **Road services** | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Very good access for any vehicles | 421 | 23.12 | 344 | 28.43 | 423 | 36.15 | 502 | 46.18 | 246 | 36.07 | 217 | 47.07 |
| Reasonable access for any vehicles | 541 | 29.71 | 291 | 24.05 | 185 | 15.81 | 259 | 23.83 | 203 | 29.77 | 58 | 12.58 |
| Very good access for trucks & buses | 77 | 4.23 | 66 | 5.45 | 38 | 3.25 | 41 | 3.77 | 43 | 6.30 | 16 | 3.47 |
| Reasonable access for trucks & buses | 223 | 12.25 | 167 | 13.80 | 119 | 10.17 | 109 | 10.03 | 47 | 6.89 | 40 | 8.68 |
| Access for cart/pack animals | 46 | 2.53 | 41 | 3.39 | 54 | 4.62 | 58 | 5.34 | 37 | 5.43 | 22 | 4.77 |
| Only on foot | 513 | 28.17 | 301 | 24.88 | 351 | 30 | 118 | 10.86 | 106 | 15.54 | 108 | 23.43 |
| **Total** | **1821** | **100** | **1210** | **100** | **1170** | **100** | **1087** | **100** | **682** | **100** | **461** | **100** |

Appendix Table 3.7.20: Frequency of group and individual meetings with extension agents in the last rainy and dry season

| **Seasons (group meeting)** | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | Mean | No. | Mean | No. | Mean | No. | Mean | No. | Mean | No. | Mean |
| Rainy season | 615 | 1.93 | 366 | 1.90 | 524 | 2.65 | 258 | 3.35 | 155 | 3.54 | 83 | 2.46 |
| Dry season | 550 | 1.99 | 329 | 1.99 | 480 | 2.96 | 239 | 3.41 | 148 | 3.21 | 79 | 3.14 |
| **Seasons (individual meeting)** | | | | | | | | | | | | |
| Rainy season | 6 | 1 | 2 | 1 | 22 | 1.95 | 12 | 3 | 9 | 1.89 | 4 | 1.5 |
| Dry season | 524 | 1.76 | 307 | 1.81 | 471 | 2.60 | 236 | 2.81 | 140 | 2.99 | 87 | 2.75 |

Appendix Table 3.7.21: Purpose of group meeting with extension agents in the last rainy and dry season

| **Purpose** | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Advice on chemical fertilizer utilization | 577 | 87.03 | 336 | 83.37 | 512 | 87.07 | 190 | 69.34 | 146 | 83.91 | 77 | 77.78 |
| advice on irrigation | 5 | 0.75 | 7 | 1.74 | 8 | 1.36 | 4 | 1.46 | - | - | 1 | 1.01 |
| Advice on new improved seeds utilization | 9 | 1.36 | 17 | 4.22 | 3 | 0.51 | 19 | 6.93 | 1 | 0.57 | 1 | 1.01 |
| Advice on epidemic diseases | 3 | 0.45 | 3 | 0.74 | 1 | 0.17 | 3 | 1.09 | - | - | - | - |
| Advice on insect infestation | 1 | 0.15 | 2 | 0.50 | 7 | 1.19 | 2 | 0.73 | 3 | 1.72 | 4 | 4.04 |
| Advice on problems related to ecosystem | 1 | 0.15 | 2 | 0.50 | - | - | 1 | 0.36 | - | - | - | - |
| Advice on input and output market | - | - | - | - | - | - | - | - | - | - | - | - |
| Advice on credit services | - | - | - | - | 2 | 0.34 | 1 | 0.36 | - | - | - | - |
| Advice on other general issues | 32 | 4.83 | 21 | 5.21 | 19 | 3.23 | 42 | 15.33 | 14 | 8.05 | 9 | 9.09 |
| Other advices | 35 | 5.28 | 15 | 3.72 | 36 | 6.12 | 12 | 4.38 | 10 | 5.75 | 7 | 7.07 |
| | **663** | **100** | **403** | **100** | **588** | **100** | **274** | **100** | **174** | **100** | **99** | **100** |

Appendix Table 3.7.22: Purpose of individual meeting with extension agents in the last rainy and dry season

| **Purpose** | **Administration zones** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central | | Eastern | | N.Western | | Southern | | South East | | Western | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Advice on chemical fertilizer utilization | 324 | 49.09 | 183 | 47.29 | 339 | 57.85 | 92 | 34.20 | 88 | 51.16 | 55 | 55 |
| advice on irrigation | 22 | 3.33 | 24 | 6.20 | 19 | 3.24 | 20 | 7.43 | 14 | 8.14 | 3 | 3 |
| Advice on new improved seeds utilization | 99 | 15 | 87 | 22.48 | 50 | 8.53 | 52 | 19.33 | 17 | 9.88 | 12 | 12 |
| Advice on epidemic diseases | 9 | 1.36 | 7 | 1.81 | 13 | 2.22 | 5 | 1.86 | 1 | 0.58 | 3 | 3 |
| Advice on insect infestation | 20 | 3.03 | 8 | 2.07 | 25 | 4.27 | 6 | 2.23 | 1 | 0.58 | 5 | 3 |
| Advice on problems related to ecosystem | 13 | 1.97 | 3 | 0.78 | 3 | 0.51 | 1 | 0.37 | - | - | - | - |
| Advice on input and output market | 1 | 0.15 | 2 | 0.52 | 3 | 0.51 | 7 | 2.60 | 3 | 1.74 | 5 | 5 |
| Advice on credit services | 3 | 0.45 | - | - | 5 | 0.85 | 1 | 0.37 | 2 | 1.16 | - | - |
| Advice on other general issues | 83 | 12.58 | 23 | 5.94 | 61 | 10.41 | 61 | 22.68 | 23 | 13.37 | 11 | 11 |
| Other advices | 86 | 13.03 | 50 | 12.92 | 68 | 11.60 | 24 | 8.92 | 23 | 13.37 | 6 | 6 |
| **Total** | **660** | **100** | **387** | **100** | **586** | **100** | **269** | **100** | **172** | **100** | **100** | **100** |

Annex Table 3.9.1: Responses of households (HOUSEHOLDs) on main of sources of drinking water, by zone

**Urban**

| Zones | PW (in rooms) | PW (in compound) | PW (out of compound) | PHDW | UHDW | BH | PS | US | RW | TT | P/R | BW | OU | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Southern | 239 | 355 | 78 | 0 | 0 | 0 | 2 | 4 | 0 | 0 | 0 | 4 | 1 | 683 |
| Mekelle | 622 | 746 | 76 | 14 | 2 | 1 | 1 | 1 | 0 | 5 | 1 | 149 | 4 | 1622 |
| Eastern | 248 | 174 | 35 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 4 | 2 | 465 |
| Central | 281 | 294 | 95 | 0 | 3 | 0 | 8 | 14 | 0 | 6 | 1 | 1 | 1 | 704 |
| Western | 133 | 85 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 235 |
| North Western | 203 | 77 | 69 | 58 | 7 | 1 | 0 | 1 | 0 | 59 | 1 | 1 | 5 | 482 |
| **Total** | **1726** | **1731** | **370** | **72** | **12** | **2** | **11** | **20** | **1** | **71** | **3** | **159** | **13** | **4191** |
| | **41.20%** | **41.30%** | **8.80%** | **1.70%** | **0.30%** | **0.05%** | **0.30%** | **0.50%** | | **1.70%** | **0.07%** | **3.8** | **0.31%** | |

**Rural**

| Zones | PW (in rooms) | PW (in compound) | PW (out of compound) | PHDW | UHDW | BH | PS | US | RW | TT | P/R | BW | OU | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| cenral | 33 | 61 | 1,202 | 38 | 92 | 21 | 112 | 350 | 4 | 18 | 11 | | 9 | 1951 |
| East | 17 | 46 | 771 | 45 | 65 | 35 | 79 | 220 | 19 | 19 | 22 | | 6 | 1344 |
| N.wet | 31 | 62 | 752 | 57 | 81 | 16 | 38 | 138 | 1 | 10 | 7 | | 5 | 1198 |
| South | 12 | 38 | 643 | 94 | 26 | 13 | 90 | 188 | 3 | 1 | 14 | | 9 | 1131 |
| South east | 7 | 34 | 420 | 71 | 14 | 2 | 32 | 81 | | 11 | 30 | | 9 | 711 |
| Western | 32 | 37 | 274 | 21 | 48 | 9 | 13 | 45 | | 3 | 3 | | 1 | 486 |
| **Total** | **132** | **278** | **4,062** | **326** | **326** | **96** | **364** | **1022** | **27** | **62** | **87** | | **39** | **6821** |
| **%** | **1.93** | **4.1** | **59.6** | **4.8** | **4.8** | **1.4** | **5.33** | **15** | **0.4** | **0.91** | **1.3** | **0** | **0.57** | |

**Infant towns**

| Zones | PW (in rooms) | PW (in compound) | PW (out of compound) | PHDW | UHDW | BH | PS | US | RW | TT | P/R | BW | OU | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| cenral | 31 | 181 | 144 | - | 1 | | 5 | 11 | 1 | 2 | - | - | - | 376 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East | 69 | 173 | 170 | 5 | 8 | 2 | 13 | 20 | 3 | 11 | 3 | 4 | 2 | 483 |
| N.west | 16 | 17 | 181 | 16 | 27 | 7 | 7 | 22 | - | 26 | 1 | 1 | 3 | 324 |
| South | 17 | 72 | 72 | 7 | 3 | - | - | 10 | - | 3 | - | - | 4 | 188 |
| South east | 4 | 43 | 35 | 7 | - | - | 1 | 4 | - | - | - | - | - | 94 |
| Western | 45 | 56 | 146 | 7 | 13 | 3 | 2 | 16 | - | 3 | - | - | 1 | 292 |
| **Total** | **182** | **542** | **748** | **42** | **52** | **12** | **28** | **83** | **4** | **45** | **4** | **5** | **10** | **1757** |
| **%** | **10.4** | **30.85** | **42.6** | **2.4** | **3** | **0.68** | **1.6** | **4.7** | **0.23** | **2.6** | **0.23** | **0.28** | **0.57** | |

NB: Pw = piped water; PHDW = Protected hand dug well: UHDW = unprotected HDW: BH = borehole; PS= protected spring: unprotected spring: TT = tanker truck; RW =collected rainwater: BW =bottled water , P/R =pond/River; OU = others ( unprotected)

Appendix Table 3.9.2: Responses of households (HOUSEHOLDs) on drinking water consumption (l/c/d), by Zone

| | | | | **Urban** | | | | |
|---|---|---|---|---|---|---|---|---|
| Zone | 0.1-25 | 25.01-40 | 40.01-50 | 50.01-60 | 60.01-80 | 80.01-100 | >100 | **Total** |
| Central | 647 | 42 | 3 | 4 | 5 | 0 | 3 | **704** |
| Eastern | 429 | 29 | 3 | 2 | 1 | 0 | 2 | **466** |
| N.Western | 378 | 66 | 9 | 6 | 10 | 5 | 5 | **479** |
| Southern | 644 | 28 | 2 | 3 | 2 | 0 | 1 | **680** |
| Mekelle | 1470 | 94 | 10 | 10 | 6 | 5 | 5 | **1600** |
| Western | 136 | 49 | 16 | 7 | 10 | 8 | 9 | **235** |
| **Total** | **3704** | **308** | **43** | **32** | **34** | **18** | **25** | **4164** |
| | | | | **Infant towns** | | | | Total |
| **zone** | ≤ 25 | 25.1 - 40 | 40.1 - 50 | 50.1 - 60 | 60.1-80 | 80.1-100 | >100 | |
| Central | 332 | 25 | 1 | 3 | 3 | - | - | 364 |
| Eastern | 422 | 28 | 3 | 2 | 2 | 1 | - | 458 |
| N.west | 271 | 30 | 2 | 1 | 2 | 1 | 2 | 309 |
| Southern | 168 | 11 | 2 | 1 | - | 1 | - | 183 |
| South eastern | 89 | 4 | - | - | - | - | - | 93 |
| western | 216 | 47 | 8 | 2 | 3 | 1 | 2 | 279 |
| Total | **1498** | **145** | **16** | **9** | **10** | **4** | 4 | 1686 |
| | | | | **Rural** | | | | |
| **zone** | ≤25 | 25.1 - 40 | 40.1 - 50 | 50.1 - 60 | 60.1-80 | 80.1-100 | >100 | 0 |
| Central | 1,742 | 65 | 7 | 6 | 1 | 1 | 5 | 1827 |
| Eastern | 1,140 | 59 | 6 | 2 | 5 | 1 | 1 | 1214 |
| N. west | 1,053 | 96 | 3 | 7 | 5 | 4 | 4 | 1172 |
| South | 1,055 | 31 | 1 | 2 | 1 | - | - | 1090 |
| South east | 668 | 18 | 1 | 1 | 2 | - | - | 690 |
| west | 411 | 39 | 6 | 2 | 4 | - | 1 | 463 |
| **Total** | | | | | | | | **6,069** |

Appendix Table 3.9.3: Responses of households (HOUSEHOLDs) on source water and mechanism of bathing, at regional level

| Zones | River | Private tube/trough | Shared tube/trough | Private shower | Shared shower | Shared tube and trough shower | using joke | Common shower | none | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| **Rural** | | | | | | | | | | |
| Central | 748 | 9 | - | 7 | 4 | 3 | 1714 | 6 | 1 | 2492 |
| East | 362 | 21 | - | 5 | 5 | 3 | 1120 | | 2 | 1518 |
| N.wet | 566 | 65 | 1 | 8 | 2 | 11 | 882 | 4 | 4 | 1543 |
| South | 323 | 44 | 4 | 6 | 2 | 3 | 901 | 1 | 12 | 1296 |
| S.East | 186 | 25 | 4 | 4 | 2 | 5 | 614 | 3 | - | 843 |
| Western | 173 | 35 | - | 3 | 3 | 2 | 356 | 2 | 2 | 576 |
| Total | **2358** | **199** | **9** | **33** | **18** | **27** | **5587** | **16** | **21** | **8268** |
| **Infant** | | | | | | | | | | |
| Central | 14 | 6 | | 47 | 18 | 3 | 299 | 1 | | 388 |
| East | 28 | 7 | 1 | 48 | 20 | 3 | 378 | 2 | 2 | 489 |
| N.wet | 117 | 18 | | 5 | 1 | 3 | 245 | 1 | - | 390 |
| South | 15 | 9 | 2 | 6 | 7 | | 158 | - | - | 197 |
| S.East | 11 | 4 | - | 4 | 1 | 2 | 80 | 1 | - | 103 |
| Western | 44 | 19 | 1 | 16 | - | - | 236 | 1 | 1 | 318 |
| **Total** | **229** | **63** | **4** | **126** | **47** | **11** | **1396** | **6** | **3** | **1885** |
| **Urban** | | | | | | | | | | |
| Southern | 11 | 28 | 5 | 56 | 47 | 4 | 487 | 7 | 17 | **662** |
| Mekelle | 19 | 133 | 33 | 361 | 333 | 25 | 618 | 18 | 40 | **1,580** |
| Eastern | 3 | 59 | 16 | 117 | 47 | 7 | 205 | 8 | 4 | **466** |
| Central | 15 | 51 | 9 | 146 | 56 | 7 | 418 | 2 | 0 | **704** |
| Western | 3 | 32 | 2 | 56 | 10 | 2 | 120 | 3 | 7 | **235** |
| N. Western | 16 | 123 | 13 | 101 | 21 | 1 | 193 | 2 | 9 | **479** |
| **Total** | **67** | **426** | **78** | **837** | **514** | **46** | **2,041** | **40** | **77** | **4,126** |

Appendix-Table 3.9.4: Respondents on time spent to fetch water and return home from main water source, at zone level

| Urban | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Zone | < 15 minute | | 15-30 minute | | 30- 60 minute | | >60 minute | |
| | No. HOUSEHOLDs | % | No. HOUSEHOLDs | % | No. HOUSEHOLDs | % | No. HOUSEHOLDs | % |
| Southern | 620 | 17 | 42 | 12.3 | 15 | 2.2 | 3 | 4.8 |
| Mekelle | 1,456 | 40 | 92 | 27 | 26 | 1.64 | 12 | 19.4 |
| Eastern | 431 | 11.8 | 26 | 7.6 | 5 | 1.07 | 4 | 6.5 |
| Central | 586 | 16.1 | 76 | 22.3 | 27 | 3.84 | 15 | 24.2 |
| Western | 202 | 5.5 | 26 | 7.6 | 5 | 2.12 | 2 | 3.2 |
| N. Western | 348 | 9.6 | 79 | 23.2 | 26 | 5.4 | 26 | 41.9 |
| **Total** | **3,643** | **-** | **341** | **-** | 104 | - | **62** | **-** |

| Infant towns | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| zone | <15 | | 15 - 30 | | 30 - 60 | | > 60 | |
| | No. HOUSEHOLDs | % | No. HOUSEHOLDs | % | No. HOUSEHOLDs | % | No. HOUSEHOLDs | % |
| Central | 287 | 23.4 | 43 | 13.3 | 25 | 25.5 | 10 | 25.6 |
| Eastern | 348 | 28.4 | 84 | 26 | 16 | 16.3 | 10 | 25.6 |
| North west | 161 | 13.1 | 101 | 31.3 | 34 | 34.7 | 13 | 33.3 |
| South | 139 | 11.3 | 36 | 11.1 | 6 | 6.1 | 2 | 5.1 |
| South east | 70 | 5.7 | 17 | 5.3 | 5 | 5.1 | 1 | 2.6 |
| West | 222 | 18.1 | 42 | 13 | 12 | 12.2 | 3 | 7.7 |
| **Total** | **1227** | | **323** | | **98** | | **39** | |

| Rural | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| zone | <15 | | 15 - 30 | | 30 - 60 | | > 60 | |
| | No. HOUSEHOLDs | % | No. HOUSEHOLDs | % | No. HOUSEHOLDs | % | No. HOUSEHOLDs | % |
| central | 473 | 21.1 | 803 | 30.1 | 349 | 33.2 | 201 | 40.2 |
| eastern | 330 | 14.7 | 495 | 18.6 | 242 | 23 | 148 | 29.6 |
| north west | 484 | 21.6 | 474 | 17.8 | 165 | 15.7 | 49 | 9.8 |
| south | 423 | 18.9 | 487 | 18.3 | 144 | 13.7 | 36 | 7.2 |
| south east | 242 | 10.8 | 284 | 10.7 | 111 | 10.6 | 55 | 11 |
| west | 288 | 12.9 | 122 | 4.6 | 41 | 3.9 | 11 | 2.2 |
| **Total** | **2240** | | **2665** | | **1052** | | **500** | |

Table 3.9.5: Respondents on who fetch water from the from the house hold, by zone level

| Zone | Adult male | | Adult female | | Female childe (<15 age) | | Male childe (<15 age) | | **Total** |
|---|---|---|---|---|---|---|---|---|---|
| | #HOUSEHOLDs | % | #HOUSEHOLDs | % | #HOUSEHOLDs | % | #HOUSEHOLDs | % | |
| **Urban** | | | | | | | | | |
| Southern | 155 | 20.2 | 575 | 75.0 | 28 | 3.7 | 9 | 1.2 | 767 |
| Mekelle | 426 | 23.1 | 1320 | 71.7 | 65 | 3.5 | 31 | 1.7 | 1842 |
| Eastern | 175 | 26.9 | 340 | 52.3 | 86 | 13.2 | 49 | 7.5 | 650 |
| Central | 230 | 24.6 | 538 | 57.5 | 105 | 11.2 | 62 | 6.6 | 935 |
| Western | 67 | 23.8 | 197 | 69.9 | 11 | 3.9 | 7 | 2.5 | 282 |
| N.Western | 143 | 25.9 | 371 | 67.2 | 24 | 4.3 | 14 | 2.5 | 552 |
| Total | **1196** | **23.8** | **3341** | **66.4** | **319** | **6.3** | **172** | **3.4** | **5028** |
| **Infant town** | | | | | | | | | |
| Central | 155 | 26.2 | 311 | 52.6 | 83 | 14.0 | 42 | 7.1 | 591 |
| Eastern | 191 | 27.6 | 370 | 53.5 | 89 | 12.9 | 41 | 5.9 | 691 |
| N. west | 90 | 20.6 | 265 | 60.6 | 53 | 12.1 | 29 | 6.6 | 437 |
| South | 50 | 20.9 | 167 | 69.9 | 15 | 6.3 | 7 | 2.9 | 239 |
| S. East | 20 | 17.9 | 87 | 77.7 | 4 | 3.6 | 1 | 0.9 | 112 |
| west | 96 | 24.3 | 234 | 59.2 | 42 | 10.6 | 23 | 5.8 | 395 |
| **Total** | **602** | **24.4** | **1434** | **58.2** | **286** | **11.6** | **143** | **5.8** | **2465** |
| **Rural** | | | | | | | | | |
| Central | 908 | 30.5 | 1498 | 50.3 | 391 | 13.1 | 180 | 6.0 | 2977 |
| Eastern | 591 | 31.2 | 969 | 51.1 | 216 | 11.4 | 120 | 6.3 | 1896 |
| N. west | 399 | 23.3 | 1009 | 58.9 | 226 | 13.2 | 80 | 4.7 | 1714 |
| South | 261 | 19.0 | 997 | 72.6 | 88 | 6.4 | 27 | 2.0 | 1373 |
| S. east | 148 | 16.7 | 645 | 72.8 | 67 | 7.6 | 26 | 2.9 | 886 |
| West | 127 | 21.0 | 394 | 65.1 | 57 | 9.4 | 27 | 4.5 | 605 |
| **Total** | **2434** | **25.8** | **5512** | **58.3** | **1045** | **11.1** | **460** | **4.9** | **9451** |

Appendix-Table 3.9.6: Respondents on adequacy of water (quantity) for domestic supply

| Zone | Urban | | | | Infant | | | | Rural | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No | | yes | | No | | Yes | | No | | Yes | |
| | #HOUSEHOLDs | % | #HOUSEHOLDs | % | #HOUSEHOLDs | % | #HOUSEHOLDs | % | #HOUSEHOLDs | % | #HOUSEHOLDs | % |
| Central | 494 | 20 | 210 | 12.4 | 196 | 22.7 | 169 | 20.5 | 808 | 30.4 | 1,018 | 26.7 |
| Eastern | 269 | 10.9 | 197 | 11.7 | 260 | 30.1 | 198 | 24.1 | 555 | 20.9 | 660 | 17.3 |
| Southern | 200 | 8.1 | 479 | 28.4 | 168 | 19.4 | 141 | 17.1 | 510 | 19.2 | 662 | 17.4 |
| N.Western | 383 | 15.5 | 96 | 5.7 | 74 | 8.6 | 109 | 13.2 | 344 | 12.9 | 746 | 19.6 |
| S.East | - | - | - | - | 49 | 5.7 | 44 | 5.4 | 222 | 8.4 | 470 | 12.3 |
| Mekelle | 1,087 | 44 | 512 | 30.3 | - | - | - | - | - | - | - | - |
| Western | 40 | 1.6 | 195 | 11.5 | 117 | 13.5 | 162 | 19.7 | 220 | 8.3 | 257 | 6.7 |
| **Total** | **2,473** | | **1,689** | | **864** | | **823** | | **2659** | | **3,813** | |

Appendix-Table 3.9.7: Responses of households (HOUSEHOLDs) on water interruption, by zone level
(Is there interruption of water supply?)

| Zone | Urban | | | | | Infant | | | | | Rural | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No | % | yes | % | **Total** | No | % | yes | % | **Total** | No | % | yes | % | **Total** |
| Central | 120 | 17 | 584 | 83 | **704** | 116 | 31.8 | 249 | 68.2 | **365** | 1,076 | 58.9 | 750 | 41.1 | **1,826** |
| Eastern | 127 | 27.3 | 339 | 72.7 | **466** | 171 | 37.3 | 287 | 62.7 | **458** | 683 | 56.2 | 532 | 43.8 | **1,215** |
| N.Western | 100 | 20.9 | 379 | 79.1 | **479** | 150 | 48.5 | 159 | 51.5 | **309** | 707 | 60.3 | 466 | 39.7 | **1,173** |
| Southern | 282 | 42.7 | 379 | 57.3 | **661** | 88 | 48.1 | 95 | 51.9 | **183** | 746 | 68.5 | 343 | 31.5 | **1,089** |
| S. East | - | - | - | - | **-** | 24 | 25.8 | 69 | 74.2 | **93** | 440 | 63.7 | 251 | 36.3 | **691** |
| Western | 117 | 49.9 | 118 | 50.1 | **235** | 139 | 49.8 | 140 | 50.2 | **279** | 242 | 52.4 | 220 | 47.6 | **462** |
| Mekelle | 257 | 16.2 | 1,327 | 83.8 | **1,584** | - | - | - | - | **-** | - | - | - | - | **-** |
| | **1,003** | **24.3** | **3,126** | **75.7** | **4,129** | **688** | **40.8** | **999** | **59.2** | **1687** | **3,894** | **60.3** | **2,562** | **39.7** | **6,456** |

Appendix-Table 3.9.9 : Responses of households (HOUSEHOLDs) on quality water, at zone level

| Zone | Urban | | | | | | |
|---|---|---|---|---|---|---|---|
| | Pure | salty | Turbidity | has odor | uncommon taste | colored watered | other |
| South | 643 | 10 | 8 | 3 | 3 | 8 | 0 |
| Mekelle | 534 | 672 | 277 | 42 | 8 | 116 | 8 |
| Eastern | 380 | 11 | 53 | 2 | 5 | 14 | 1 |
| Central | 608 | 44 | 40 | 1 | 1 | 7 | 1 |
| Western | 230 | 1 | 3 | 0 | 0 | 1 | 1 |
| N.Western | 402 | 3 | 66 | 6 | 12 | 2 | 6 |
| **Total** | **2797** | **741** | **447** | **54** | **29** | **148** | **17** |

| Zone | Infant towns | | | | | | |
|---|---|---|---|---|---|---|---|
| | Pure | Salty | Turbidity | has odor | Uncommon taste | Colored water | other |
| Central | 336 | 8 | 23 | 2 | 3 | 3 | 3 |
| Eastern | 328 | 64 | 67 | 17 | 12 | 23 | 4 |
| N. west | 251 | 10 | 52 | 13 | 6 | 2 | 7 |
| South | 171 | 3 | 6 | 1 | 1 | | 2 |
| S. East | 87 | 5 | 1 | 1 | | 1 | |
| west | 256 | 1 | 18 | 1 | | | 3 |
| **total** | **1429** | **91** | **167** | **35** | **22** | **29** | **19** |

| **Zone** | Rural | | | | | | |
|---|---|---|---|---|---|---|---|
| | Pure | Salty | Turbidity | has odor | Uncommon taste | Colored water | other |
| Central | 1,370 | 84 | 408 | 101 | 90 | 55 | 26 |
| Eastern | 845 | 63 | 307 | 67 | 60 | 30 | 16 |
| North west | 904 | 52 | 225 | 54 | 30 | 13 | 20 |
| South | 900 | 9 | 149 | 8 | 10 | 5 | 13 |
| S.East | 560 | 34 | 114 | 16 | 10 | 21 | 2 |
| west | 368 | 3 | 75 | 11 | 5 | - | 2 |
| **total** | **4,947** | **245** | **1278** | **257** | **205** | **124** | **79** |

Appendix-Table 3.9.10. Responses of households (HOUSEHOLDs) on drinking water treatment, at Zonal level

| Zone | Urban | | | | | Infant towns | | | | | Rural | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No | | Yes | | Total | No | | Yes | | Total | No | | Yes | | Total |
| | # of HOUSEHOLDs | % | # of HOUSEHOLDs | % | | #HOUSEHOLDs | % | #HOUSEHOLDs | % | | #HOUSEHOLDs | % | #HOUSEHOLDs | % | |
| Central | 603 | 85.7 | 101 | 14.4 | **704** | 350 | 95.9 | 15 | 4.1 | **365** | 1,633 | 89.4 | 193 | 10.6 | **1,826** |
| Eastern | 379 | 81.3 | 87 | 18.7 | **466** | 402 | 87.8 | 56 | 12.2 | **458** | 1,060 | 87.2 | 155 | 12.8 | **1,215** |
| N. West | 340 | 71 | 139 | 29 | **479** | 259 | 83.8 | 50 | 16.2 | **309** | 1,026 | 87.5 | 146 | 12.5 | **1,172** |
| South | 608 | 91.8 | 54 | 8.2 | **662** | 178 | 97.3 | 5 | 2.7 | **183** | 963 | 88.4 | 126 | 11.6 | **1,089** |
| S. East | - | - | - | - | **-** | 88 | 94.6 | 5 | 5.4 | **93** | 627 | 91 | 62 | 9 | **689** |
| west | 198 | 84.3 | 37 | 15.7 | **235** | 251 | 90 | 28 | 10 | **279** | 397 | 85.9 | 65 | 14.1 | **462** |
| Mekelle | 1,216 | 76.3 | 378 | 23.7 | **1,594** | - | - | - | - | **-** | - | - | - | - | **-** |
| **Total** | **3,344** | **80.8** | **796** | **19.2** | **4,140** | **1528** | **90.6** | **159** | **9.4** | **1687** | **5,706** | **88.4** | **747** | **11.6** | **6,453** |

Appendix-Table 3.9.11 Respondents on the use of drinking water treatment mechanisms

| Urban | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Zone** | **Boiling** | | **Add chemicals** | | **Filtering** | | **Use filtering equipments** | | **Other** | |
| | **#HOUSEHOLDs** | **%** | **#HOUSEHOLDs** | **%** | **#HOUSEHOLDs** | **%** | **#HOUSEHOLDs** | **%** | **#HOUSEHOLDs** | **%** |
| Southern | 22 | 8.9 | 38 | 6.95 | 1 | 4.8 | - | 0 | 2 | 3.4 |
| Mekelle | 80 | 32.4 | 288 | 52.6 | 3 | 14.3 | 11 | 57.9 | 23 | 39.6 |
| Eastern | 36 | 14.6 | 51 | 9.3 | 5 | 23.8 | 4 | 21 | 8 | 13.8 |
| Central | 49 | 19.8 | 52 | 9.5 | 10 | 47.6 | 3 | 15.8 | 7 | 12.1 |
| Western | 11 | 4.5 | 28 | 5.1 | 1 | 4.8 | - | 0 | 6 | 10.3 |
| N.Western | 49 | 19.8 | 90 | 16.5 | 1 | 4.8 | 1 | 5.3 | 12 | 20.7 |
| **Total** | **247** | | **547** | | **21** | | **19** | 100 | **58** | |
| **Rural** | | | | | | | | | | |
| **Zone** | **#HOUSEHOLDs** | **%** | **#HOUSEHOLDs** | **%** | **#HOUSEHOLDs** | **%** | **#HOUSEHOLDs** | **%** | **#HOUSEHOLDs** | **%** |
| central | 64 | 23.4 | 140 | 27.2 | 16 | 17.6 | 18 | 43.9 | | - |
| East | 81 | 29.7 | 74 | 14.4 | 31 | 34.1 | 13 | 31.7 | 3 | 15.8 |
| N.wet | 39 | 14.3 | 104 | 20.2 | 27 | 29.7 | 7 | 17.1 | 4 | 21 |
| South | 43 | 15.8 | 93 | 18.1 | 4 | 4.4 | 3 | 7.3 | 6 | 31.6 |
| South east | 22 | 8.1 | 51 | 9.9 | 4 | 4.4 | - | - | 4 | 21 |
| Western | 24 | 8.9 | 52 | 10.1 | 9 | 9.9 | - | - | 2 | 10.5 |
| Total | **273** | 1 | **514** | | **91** | | **41** | | **19** | |
| **Infant** | | | | | | | | | | |

| Zone | #HOUSEHOLDs | % | #HOUSEHOLDs | % | #HOUSEHOLDs | % | #HOUSEHOLDs | % | #HOUSEHOLDs | % |
|---|---|---|---|---|---|---|---|---|---|---|
| central | 5 | 12.5 | 13 | 10.2 | - | - | - | - | - | - |
| East | 15 | 37.5 | 44 | 34.6 | 2 | 20 | 2 | 100 | - | - |
| N.wet | 14 | 35 | 37 | 29.1 | 7 | 70 | - | - | 2 | 66.7 |
| South | - | - | 5 | 3.9 | - | - | | - | | - |
| S. East | - | - | 4 | 3.2 | - | - | | - | 1 | 33.3 |
| Western | 6 | 15 | 24 | 18.9 | 1 | 10 | | - | | - |
| **Total** | **40** | 1 | **127** | | **10** | 1 | **2** | | **3** | |

Appendix Table 3.9.12: Response of HOUSEHOLDs on major problem of water supply, by zone level

| Urban | | | | | | |
|---|---|---|---|---|---|---|
| **Zone** | **Interruption** | **drying** | **Poor quality** | **high cost** | **coverage** | **other** |
| central | 589 | 127 | 59 | 58 | 235 | 21 |
| eastern | 372 | 55 | 72 | 19 | 93 | 9 |
| north west | 402 | 142 | 45 | 76 | 120 | 12 |
| south | 470 | 48 | 18 | 27 | 98 | 53 |
| south east | - | - | - | - | - | - |
| west | 121 | 15 | 3 | 23 | 17 | 21 |
| Mekelle | 682 | 311 | 342 | 14 | 104 | 16 |
| **Total** | **2636** | **698** | **539** | **217** | **667** | **132** |
| **Infant towns** | | | | | | |
| **Zone** | **Interruption** | **drying** | **poor quality** | **cost** | **coverage** | **other** |
| central | 254 | 79 | 21 | 58 | 123 | 71 |
| eastern | 326 | 85 | 78 | 41 | 125 | 72 |
| north west | 160 | 74 | 50 | 12 | 98 | 75 |
| south | 103 | 17 | 8 | 9 | 24 | 68 |
| south east | 70 | 8 | 4 | 36 | 14 | 14 |
| west | 149 | 33 | 13 | 35 | 53 | 87 |
| total | 1062 | 296 | 174 | 191 | 437 | 387 |
| **Rural** | | | | | | |
| **Zone** | **Interruption** | **drying** | **poor quality** | **high cost** | **coverage** | **other** |
| central | 841 | 532 | 342 | 153 | 499 | 511 |
| eastern | 595 | 387 | 275 | 108 | 324 | 303 |
| north west | 481 | 235 | 188 | 97 | 285 | 363 |
| south | 316 | 125 | 100 | 40 | 253 | 469 |
| south east | 250 | 84 | 67 | 27 | 176 | 299 |
| west | 213 | 92 | 57 | 30 | 76 | 285 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Total** | **2696** | **1455** | **1029** | **455** | **1613** | **2230** |

Appendix Table 3.9.13: Response of HOUSEHOLDs on major problem of water supply, by Zone

| | Do you pay for water? | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Urban | | | | | Infant towns | | | | | Rural | | | | |
| Zoba | No | | Yes | | Total | No | | Yes | | Total | No | | Yes | | Total |
| | #HOUSEHOLDs | % | #HOUSEHOLDs | % | | #HOUSEHOLDs | % | #HOUSEHOLDs | % | | #HOUSEHOLDs | % | #HOUSEHOLDs | % | |
| Central | 48 | 6.8 | 656 | 93.2 | **704** | 23 | 6.3 | 342 | 93.7 | **365** | 604 | 33.1 | 1222 | 66.9 | **1826** |
| Eastern | 32 | 6.9 | 434 | 93.1 | **466** | 55 | 12.0 | 403 | 88.0 | **458** | 401 | 33.0 | 814 | 67.0 | **1215** |
| N.Western | 38 | 7.9 | 441 | 92.1 | **479** | 85 | 27.5 | 224 | 72.5 | **309** | 421 | 35.9 | 751 | 64.1 | **1172** |
| Southern | 112 | 16.6 | 564 | 83.4 | **676** | 18 | 9.8 | 165 | 90.2 | **183** | 376 | 34.5 | 714 | 65.5 | **1090** |
| S. East | - | - | - | - | **-** | 13 | 14.0 | 80 | 86.0 | **93** | 171 | 24.7 | 521 | 75.3 | **692** |
| Western | 7 | 3.0 | 228 | 97.0 | **235** | 36 | 12.9 | 243 | 87.1 | **279** | 144 | 31.2 | 318 | 68.8 | **462** |
| Mekelle | 314 | 19.7 | 1,283 | 80.3 | **1597** | - | - | - | - | **-** | - | - | - | - | |
| **Total** | **551** | 13.3 | **3,606** | 86.7 | **4157** | **230** | 13.6 | **1457** | 86.4 | **1687** | **2117** | 32.8 | **4340** | 67.2 | **6457** |

Appendix Table 3.9.14: Responses of Households and monthly payment for water services

| | Urban | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | <=25 | | 25.1-50 | | 50.1 – 100 | | 100.1 – 200 | | 200.1 – 400 | | >400 | | |
| Zone | #HOUSEHOLDs | % | #HOUSEHOLDs | % | #HOUSEHOLDs | % | #HOUSEHOLDs | % | #HOUSEHOLDs | % | #HOUSEHOLDs | % | #HOUSEHOLDs |
| Central | 324 | 20.6 | 214 | 18 | 76 | 14.7 | 24 | 10.4 | 10 | 10.5 | 9 | 23.7 | |
| Eastern | 237 | 15.1 | 129 | 10.9 | 46 | 8.9 | 14 | 6.1 | 6 | 6.3 | 4 | 10.5 | |
| N. west | 128 | 8.2 | 146 | 12.3 | 87 | 16.9 | 57 | 24.8 | 37 | 38.9 | 11 | 29 | |
| south | 296 | 18.8 | 192 | 16.2 | 55 | 10.7 | 13 | 5.7 | 3 | 3.2 | 2 | 5.3 | |
| Mekelle | 568 | 36.2 | 446 | 37.5 | 167 | 32.4 | 85 | 37 | 18 | 19 | 4 | 10.5 | |
| west | 18 | 1.2 | 61 | 5.1 | 85 | 16.5 | 37 | 16.1 | 21 | 22 | 8 | 21.1 | |
| **total** | **1571** | | **1188** | | **516** | | **230** | | **95** | | **38** | | **3638** |
| | **Infant towns** | | | | | | | | | | | | |
| Central | 177 | 25.0 | 93 | 25.8 | 50 | 22.8 | 16 | 14.0 | 2 | 7.4 | 6 | 18.8 | |
| Eastern | 242 | 34.2 | 103 | 28.6 | 36 | 16.4 | 19 | 16.7 | 1 | 3.7 | 2 | 6.3 | |
| N.west | 119 | 16.8 | 38 | 10.6 | 32 | 14.6 | 19 | 16.7 | 7 | 25.9 | 9 | 28.1 | |
| South | 80 | 11.3 | 53 | 14.7 | 22 | 10.0 | 8 | 7.0 | 1 | 3.7 | 1 | 3.1 | |
| S. East | 46 | 6.5 | 24 | 6.7 | 8 | 3.7 | 1 | 0.9 | | 0.0 | 1 | 3.1 | |
| West | 43 | 6.1 | 49 | 13.6 | 71 | 32.4 | 51 | 44.7 | 16 | 59.3 | 13 | 40.6 | |
| **total** | **707** | | **360** | | **219** | | **114** | | **27** | | **32** | | **1459** |
| | **Rural** | | | | | | | | | | | | |
| Central | 1,093 | 30.9 | 82 | 19.7 | 23 | 11.3 | 19 | 15.6 | 2 | 5.4 | 1 | 3.7 | |
| Eastern | 755 | 21.3 | 33 | 7.9 | 10 | 4.9 | 15 | 12.3 | 1 | 2.7 | | | |
| N.west | 490 | 13.8 | 100 | 24.0 | 86 | 42.2 | 40 | 32.8 | 20 | 54.1 | 15 | 55.6 | |
| South | 571 | 16.1 | 109 | 26.2 | 28 | 13.7 | 6 | 4.9 | 1 | 2.7 | 2 | 7.4 | |
| S. East | 479 | 13.5 | 33 | 7.9 | 8 | 3.9 | 2 | 1.6 | 2 | 5.4 | 3 | 11.1 | |
| West | 153 | 4.3 | 59 | 14.2 | 49 | 24.0 | 40 | 32.8 | 11 | 29.7 | 6 | 22.2 | |
| **total** | **3,541** | | **416** | | **204** | | **122** | | **37** | | **27** | | **4,347** |

Appendix Table 6 15; Respondents HOUSEHOLDS on tariff of drinking water supply, by zone level

**(Is the current tariff expensive? )**

| Zone | Urban | | | | Infant town | | | | Rural | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No | | yes | | No | | Yes | | No | | Yes | |
| | #HOUSEHOLDs | % | #HOUSEHOLDs | % | #HOUSEHOLDs | % | #HOUSEHOLDs | % | #HOUSEHOLDs | % | #HOUSEHOLDs | % |
| Central | 459 | 17.1 | 245 | 19.5 | 207 | 12.3 | 158 | 9.4 | 1,474 | 22.8 | 352 | 5.5 |
| Eastern | 346 | 12.9 | 120 | 9.5 | 293 | 17.4 | 165 | 9.8 | 942 | 14.6 | 273 | 4.2 |
| N.Western | 218 | 8.1 | 261 | 20.8 | 196 | 11.6 | 113 | 6.7 | 880 | 13.6 | 292 | 4.5 |
| Southern | 475 | 17.7 | 170 | 13.5 | 133 | 7.9 | 50 | 3 | 875 | 13.55 | 215 | 3.3 |
| S.East | - | - | - | - | 67 | 4 | 26 | 1.5 | 564 | 8.7 | 128 | 2 |
| Western | 131 | 4.9 | 104 | 8.3 | 134 | 7.9 | 145 | 8.6 | 299 | 4.6 | 163 | 2.5 |
| Mekelle | 1,060 | 39.4 | 357 | 28.4 | - | - | - | - | - | - | - | - |
| **Total** | **2,689** | | **1,257** | | **1030** | 61 | **657** | 39 | **5,034** | 78 | **1,423** | |

Appendix Table 3.9.17: Respondents HOUSEHOLDS on willingness to pay additional for additional investment on the drinking water supply, at regional level

| Zone | Urban | | | | | infant town | | | | | Rural | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No | | Yes | | Total | No | | Yes | | Total | No | | Yes | | Total |
| | #HOUSEHOLDs | % | #HOUSEHOLDs | % | | #HOUSEHOLDs | % | #HOUSEHOLDs | % | | #HOUSEHOLDs | % | #HOUSEHOLDs | % | |
| Central | 453 | 64.3 | 251 | 35.7 | 704 | 321 | 87.9 | 44 | 12.1 | 365 | 1,302 | 71.3 | 524 | 28.7 | 1,826 |
| Eastern | 265 | 56.9 | 201 | 43.1 | 466 | 333 | 72.7 | 125 | 27.3 | 458 | 853 | 70.2 | 362 | 29.8 | 1,215 |
| N. Western | 233 | 48.6 | 246 | 51.4 | 479 | 199 | 64.4 | 110 | 35.6 | 309 | 776 | 66.2 | 396 | 33.8 | 1,172 |
| Southern | 412 | 69.2 | 183 | 30.8 | 595 | 148 | 80.9 | 35 | 19.1 | 183 | 827 | 75.9 | 263 | 24.1 | 1,090 |
| S. east | - | - | - | - | - | 68 | 73.1 | 25 | 26.9 | 93 | 540 | 78.1 | 151 | 21.9 | 691 |
| Western | 182 | 77.4 | 53 | 22.6 | 235 | 198 | 71.0 | 81 | 29.0 | 279 | 293 | 63.4 | 169 | 36.6 | 462 |
| Mekelle | 507 | 33.2 | 1,021 | 66.8 | 1,528 | - | - | - | - | - | - | - | - | - | - |
| **Total** | **2,052** | **51.2** | **1,955** | **48.8** | **4,007** | **1267** | **75.1** | **420** | **24.9** | **1687** | **4,591** | **71.1** | **1,865** | **28.9** | **6,456** |

AppendixTable 3.9.18: Water supply coverage for urban, infant towns and rural areas

| Zone | Coverage (%) | | |
|---|---|---|---|
| | Urban (major towns) | Infant town | Rural |
| Mekelle | 1.8 | - | - |
| Southern | 3.2 | 7.3 | 16.9 |
| S.East | - | 3.8 | 17.4 |
| Eastern | 3.8 | 6.4 | 21.6 |
| Central | 4.7 | 7.6 | 17.3 |
| Western | 30.5 | 23.4 | 30.4 |
| N.West | 13.1 | 9.6 | 29.2 |
| **Regional average** | **5.53** | **10.1** | **21.5** |

Appendix Table 3.9.19: Responses of households (HHs) on availability of irrigation scheme, by zone

| Zone | Urban | | | | | Infant town | | | | | Rural | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No | | yes | | Total | No | | Yes | | Total | No | | Yes | | Total |
| | #HOUSEHOLDs | % | #HOUSEHOLDs | % | | #HOUSEHOLDs | % | #HOUSEHOLDs | % | | #HOUSEHOLDs | % | #HOUSEHOLDs | % | |
| Central | 689 | 97.9 | 15 | 2.1 | 704 | 356 | 97.5 | 9 | 2.5 | 365 | 1,702 | 93.2 | 124 | 6.79 | 1,826 |
| Eastern | 463 | 99.4 | 3 | 0.6 | 466 | 446 | 97.4 | 12 | 2.6 | 458 | 1,141 | 93.9 | 74 | 6.09 | 1,215 |
| N.Western | 473 | 98.7 | 6 | 1.3 | 479 | 298 | 96.4 | 11 | 3.6 | 309 | 1,122 | 95.7 | 50 | 4.27 | 1,172 |
| Southern | 666 | 99.0 | 7 | 1.0 | 673 | 170 | 92.9 | 13 | 7.1 | 183 | 1,007 | 92.4 | 83 | 7.61 | 1,090 |
| S. East | - | - | - | - | - | 89 | 95.7 | 4 | 4.3 | 93 | 662 | 95.5 | 31 | 4.47 | 693 |
| Western | 232 | 98.7 | 3 | 1.3 | 235 | 276 | 98.9 | 3 | 1.1 | 279 | 449 | 97.2 | 13 | 2.81 | 462 |
| Mekelle | 1579 | 98.8 | 19 | 1.2 | 1598 | - | - | - | - | - | - | - | - | - | - |
| Total | **4102** | **98.7** | **53** | **1.3** | **4155** | **1635** | 96.9 | **52** | 3.1 | 1687 | **6,083** | 94.2 | **375** | 5.81 | 6,458 |

Appendix Table 3.9.20: Responses of households (HOUSEHOLDs) on type of irrigation), by zone

| Zone | Urban | | | | | **Infant town** | | | | | Rural | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | full irrigation | | supplementary irrigation | | Total | full irrigation | | supplementary irrigation | | total | full irrigation | | supplementary irrigation | | Total |
| | # HOUSEHOLDs | % | # HOUSEHOLDs | % | | #HOUSEHOLDs | % | #HOUSEHOLDs | % | | #HOUSEHOLDs | % | #HOUSEHOLDs | % | |
| Central | 9 | 60 | 6 | 40 | **15** | 8 | 88.9 | 1 | 11.1 | 9 | 65 | 52.4 | 59 | 47.6 | 124 |
| Eastern | 1 | 33.3 | 2 | 66.7 | **3** | 5 | 41.7 | 7 | 58.3 | 12 | 30 | 40.5 | 44 | 59.5 | 74 |
| N.Western | 5 | 83.3 | 1 | 16.7 | **6** | 4 | 36.4 | 7 | 63.6 | 11 | 19 | 38.0 | 31 | 62.0 | 50 |
| Southern | 6 | 85.7 | 1 | 14.3 | **7** | 11 | 84.6 | 2 | 15.4 | 13 | 67 | 80.7 | 16 | 19.3 | 83 |
| S. East | | | | | | 3 | 75.0 | 1 | 25.0 | 4 | 25 | 80.6 | 6 | 19.4 | 31 |
| Western | 3 | 100 | 0 | 0.0 | **3** | 1 | 33.3 | 2 | 66.7 | 3 | 5 | 38.5 | 8 | 61.5 | 13 |
| Mekelle | 7 | 46.7 | 8 | 53.3 | **15** | | | | | | | | | | |
| **Total** | **31** | **63.3** | **18** | **36.7** | **49** | **32** | **61.5** | **20** | **38.5** | **52** | **211** | **56.3** | **164** | **43.7** | **375** |

Appendix Table 3.9.21: Responses of households (HOUSEHOLDs) on Source of water for irrigation), at zone level

**Urban**

| Zone | dam | | river | | spring | | Pond | | Private HDW | | communal HDW | | Deep well | | other | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | # HOUSEHOLDs | % | # HOUSEHOLDs | % | # HOUSEHOLDs | % | # HOUSEHOLDs | % | # HOUSEHOLDs | % | # HOUSEHOLDs | % | # HOUSEHOLDs | % | # HOUSEHOLDs | % | |
| Southern | 1 | 14.3 | - | - | 3 | 42.9 | - | - | - | - | - | - | 2 | 28.6 | 1 | 14.3 | 7 |
| Mekelle | - | - | 8 | 50 | 2 | 12.5 | 1 | 6.3 | 3 | 18.8 | 2 | 12.5 | - | - | - | - | 16 |
| Eastern | - | - | - | - | - | - | - | - | - | 0.0 | 1 | 33.3 | 2 | 66.7 | - | - | 3 |
| Central | 3 | 20.0 | 3 | 20 | 5 | 33.3 | - | - | 2 | 13.3 | 1 | 6.7 | 1 | 6.7 | - | - | 15 |
| Western | 1 | 33.3 | - | - | 1 | 33.3 | - | - | - | 0.0 | 1 | 33.3 | - | - | - | - | 3 |
| North Western | - | - | - | - | - | - | - | - | 4 | 80.0 | - | - | - | - | 1 | 20.0 | 5 |
| Total | 5 | 10.4 | 11 | 22.92 | 11 | 22.9 | 1 | 2.1 | 8 | 16.7 | 5 | 10.4 | 5 | 10.4 | 2 | 4.2 | 48 |

**Infant towns**

| Zones | Dam | | River | | Spring | | Pond | | Private HDW | | Communal HDW | | Deep well | | other | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | # HOUSEHOLDs | % | # HOUSEHOLDs | % | # HOUSEHOLDs | % | # HOUSEHOLDs | % | # HOUSEHOLDs | % | # HOUSEHOLDs | % | # HOUSEHOLDs | % | # HOUSEHOLDs | % | |
| central | 6 | 54.5 | 2 | 18.2 | 1 | 9.1 | - | - | 1 | 9.1 | 1 | 9.1 | - | - | - | - | 11 |
| East | 2 | 14.3 | 6 | 42.9 | 3 | 21.4 | - | - | 1 | 7.1 | 2 | 14.3 | - | - | - | - | 14 |
| N.west | 1 | 7.7 | 5 | 38.5 | 2 | 15.4 | - | - | 4 | 30.8 | 1 | 7.7 | - | - | - | - | 13 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South | 3 | 23.1 | 3 | 23.1 | 5 | 38.5 | - | - | 1 | 7.7 | - | - | 1 | 7.7 | - | - | 13 |
| S.East | 2 | 50.0 | - | - | 1 | 25.0 | - | - | 1 | 25.0 | - | - | - | - | - | - | 4 |
| Western | - | - | 1 | 25.0 | 1 | 25.0 | 1 | 25 | 1 | 25.0 | - | - | - | - | - | - | 4 |
| Total | 14 | 23.7 | 17 | 28.8 | 13 | 22.0 | 1 | 1.7 | 9 | 15.3 | 4 | 6.78 | 1 | 1.7 | | | 59 |

**Rural**

| Zones | Dam | | River | | Spring | | Pond | | Private HDW | | Communal HDW | | Deep well | | other | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | # HOUSEHOLDs | % | # HOUSEHOLDs | % | # HOUSEHOLDs | % | # HOUSEHOLDs | % | # HOUSEHOLDs | % | # HOUSEHOLDs | % | # HOUSEHOLDs | % | # HOUSEHOLDs | % | |
| central | 30 | 21.4 | 49 | 35 | 32 | 22.9 | 5 | 3.6 | 15 | 10.7 | 7 | 5 | 1 | 0.7 | 1 | 0.7 | 140 |
| East | 8 | 10.4 | 27 | 35.1 | 23 | 29.9 | - | - | 11 | - | 5 | 6.5 | 2 | 2.6 | 1 | 1.3 | 77 |
| N.West | 3 | 5.9 | 12 | 23.5 | 9 | 17.6 | 2 | 3.9 | 17 | - | 6 | 11.8 | 2 | 3.9 | - | - | 51 |
| South | 7 | 7.9 | 41 | 46.1 | 33 | 37.1 | - | 0.0 | 2 | - | 2 | 2.2 | 3 | 3.4 | 1 | 1.1 | 89 |
| S.East | 8 | - | 10 | - | 11 | - | - | - | 5 | - | - | - | - | - | - | - | - |
| Western | 1 | 6.7 | 4 | 26.7 | 6 | 40.0 | 1 | 6.7 | 2 | - | - | - | - | - | 1 | 6.7 | 15 |
| **Total** | **57** | 14.0 | **143** | 35.2 | **114** | 28.1 | **8** | 2.0 | **52** | - | **20** | 4.9 | **8** | 2.0 | **4** | 1.0 | 406 |

Appendix Table 3.9.22: Responses of households (HOUSEHOLDs) on water sources preferences for irrigating, at regional level

**Urban**

| Zone | Dam | River | Spring | Pond | Private HDW | Communal HDW | Deep well | Other | Total |
|---|---|---|---|---|---|---|---|---|---|
| Southern | 2 | - | 2 | - | - | - | 2 | 1 | 7 |
| Mekelle | 8 | 4 | 1 | - | 1 | 1 | - | - | 15 |
| Eastern | - | - | - | 1 | 1 | - | 1 | - | 3 |
| Central | 6 | 1 | 2 | - | 5 | 1 | - | - | 15 |
| Western | - | 1 | 1 | - | 1 | - | - | - | 3 |
| N. Western | 1 | - | - | 1 | 3 | - | - | 1 | 6 |
| Total | 17 | 6 | 6 | 2 | 11 | 2 | 3 | 2 | 49 |

**Infant towns**

| Zones | Dam | River | Spring | Pond | Private HDW | Communal HDW | Deep well | other | |
|---|---|---|---|---|---|---|---|---|---|
| Central | 5 | 2 | 2 | - | - | - | 1 | - | 10 |
| East | 3 | 4 | 3 | - | 3 | 2 | 2 | - | 17 |
| N.west | 2 | 5 | 1 | - | 3 | - | 1 | - | 12 |
| South | 3 | 4 | 4 | - | 1 | - | 1 | - | 13 |
| S. east | 1 | - | 1 | 1 | 1 | - | - | - | 4 |
| Western | - | 1 | 1 | 1 | - | - | - | - | 3 |
| **Total** | 14 | **16** | **12** | **2** | **8** | **2** | **5** | **-** | 59 |

**Rural**

| Zones | Dam | River | Spring | Pond | Private HDW | Communal HDW | Deep well | other | |
|---|---|---|---|---|---|---|---|---|---|
| central | 40 | 48 | 27 | 1 | 20 | 5 | 7 | 2 | 150 |
| East | 18 | 20 | 17 | 3 | 14 | 2 | 9 | 1 | 84 |
| N.wet | 9 | 15 | 11 | 1 | 12 | 5 | 2 | - | 55 |
| South | 18 | 35 | 26 | - | 1 | 1 | 4 | 2 | 87 |
| S. East | 13 | 8 | 7 | - | 4 | - | - | - | 32 |
| Western | 1 | 4 | 7 | 1 | 1 | - | - | - | 14 |
| **Total** | **99** | **130** | **95** | **6** | **52** | **13** | **22** | **5** | 422 |

Appendix-Table 3.9.23: Responses of households (HOUSEHOLDs) on size of irrigable land (Ha), by zone

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Urban** | | | | | | | |
| | **Size of land under irrigatioon (ha)** | | | | | | |
| Zone | <=0.25 | 0.25-0.5 | 0.5-1 | 1-1.5 | 1.5-2 | >2 | Total |
| Southern | 2 | 1 | 3 | - | 1 | - | 7 |
| Mekelle | 6 | 6 | 3 | - | - | - | 15 |
| Eastern | 1 | 2 | - | - | - | - | 3 |
| Central | 3 | 8 | 3 | - | - | 1 | 15 |
| Western | - | - | - | - | 1 | 2 | 3 |
| N.Western | 4 | 1 | 1 | - | - | - | 6 |
| **Total** | **16** | **18** | **10** | | **2** | **3** | **49** |
| **Infant towns** | | | | | | | |
| central | 4 | 2 | 2 | - | - | 1 | 9 |
| East | 8 | 2 | 2 | - | - | - | 12 |
| N.west | 7 | 3 | 1 | - | - | - | 11 |
| South | 9 | 1 | 3 | - | - | - | 13 |
| South east | 1 | - | 3 | - | - | - | 4 |
| Western | 1 | - | 1 | - | 1 | - | 3 |
| **Total** | **30** | **8** | **12** | | **1** | **1** | **52** |
| **Rural** | | | | | | | |
| central | 37 | 22 | 8 | 1 | 1 | 3 | 72 |
| East | 42 | 14 | 11 | 1 | 10 | 2 | 80 |
| N.west | 27 | 13 | - | - | - | - | 40 |
| South | 53 | 16 | 15 | - | - | - | 84 |
| South east | 42 | 3 | 11 | - | - | - | 14 |
| Western | 6 | 4 | 3 | - | - | - | 13 |
| **Total** | **165** | **72** | **48** | **2** | **11** | **5** | **303** |

Appendix Table 3.9.24: Responses of households (HOUSEHOLDs) irrigating technology/method, at regional level

| Zone | canal | | tube | | Sprinkler | | Other (drip , treadle pump e.t.c) | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | #HOUSEHOLDs | % | #HOUSEHOLDs | % | #HOUSEHOLDs | % | #HOUSEHOLDs | % | |
| **Urban** | | | | | | | | | |
| Southern | 2 | 28.6 | 5 | 71.4 | 0 | 0 | 0 | 0 | 7 |
| Mekelle | 8 | 53.3 | 6 | 40.0 | 1 | 6.7 | 0 | 0 | 15 |
| Eastern | 1 | 33.3 | 2 | 66.7 | 0 | 0 | 0 | 0 | 3 |
| Central | 7 | 46.7 | 3 | 20.0 | 0 | 0 | 5 | 33.3 | 15 |
| Western | 0 | 0.0 | 2 | 66.7 | 0 | 0 | 1 | 33.3 | 3 |
| North Western | 0 | 0.0 | 5 | 100.0 | 0 | 0 | 0 | 0.0 | 5 |
| **Total** | **18** | **37.5** | **23** | **47.9** | **1** | **2.1** | **6** | **12.5** | **48** |
| **Infant town** | | | | | | | | | |
| Central | 7 | 70 | 2 | 20 | | 0 | 1 | 10 | 10 |
| East | 4 | 33.3 | 4 | 33.3 | 1 | 8.3 | 3 | 25 | 12 |
| N.west | 5 | 41.7 | 5 | 41.7 | - | 0.0 | 2 | 16.7 | 12 |
| South | 12 | 92.3 | 1 | 7.7 | - | 0.0 | - | 0.0 | 13 |
| South east | 3 | 75.0 | | 0.0 | - | 0.0 | 1 | 25.0 | 4 |
| Western | 1 | 33.3 | 1 | 33.3 | 1 | 33.3 | - | 0.0 | 3 |
| **Total** | 32 | 59.3 | **13** | 24.1 | **2** | 3.7 | **7** | 13.0 | 54 |
| **Rural** | | | | | | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| central | 78 | 60.5 | 35 | 60.5 | 6 | 4.7 | 10 | 7.8 | 129 |
| East | 44 | 53.7 | 27 | 53.7 | 4 | 4.9 | 7 | 8.5 | 82 |
| N.West | 23 | 40.4 | 18 | 40.4 | 3 | 5.3 | 13 | 22.8 | 57 |
| South | 80 | 93.0 | 4 | 93.0 | | 0.0 | 2 | 2.3 | 86 |
| South east | 25 | 75.8 | 2 | 75.8 | 1 | 3.0 | 5 | 15.2 | 33 |
| Western | 6 | 42.9 | 5 | 42.9 | 1 | 7.1 | 2 | 14.3 | 14 |
| **Total** | **256** | 63.8 | **91** | 63.8 | **15** | 3.7 | **39** | 9.7 | 401 |

Table 3.9.25: Responses of households (HOUSEHOLDs) on water source adequacy (sustainability) though out the year for irrigation, by zone

| Zone | Urban | | | | | Infant town | | | | | Rural | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No | | Yes | | Total | No | | Yes | | Total | No | | Yes | | Total |
| | #HOUSEHOLDs | % | #HOUSEHOLDs | % | | #HOUSEHOLDs | % | #HOUSEHOLDs | % | | #HOUSEHOLDs | % | #HOUSEHOLDs | % | |
| Central | 5 | 35.7 | **9** | 64.3 | **14** | - | 0 | 9 | 100 | **9** | 44 | 36.1 | 78 | 0.64 | **122** |
| Eastern | 1 | 25 | **3** | 75.0 | **4** | 3 | 33.3 | 6 | 66.7 | **9** | 34 | 57.6 | 25 | 0.42 | **59** |
| North Western | 1 | 20 | **4** | 80.0 | **5** | 3 | 27.3 | 8 | 72.7 | **11** | 15 | 30.0 | 35 | 0.70 | **50** |
| Southern | 1 | 16.7 | **5** | 83.3 | **6** | 6 | 46.2 | 7 | 53.8 | **13** | 29 | 34.9 | 54 | 0.65 | **83** |
| S.East | - | - | - | - | - | 2 | 50.0 | 2 | 50.0 | **4** | 7 | 22.6 | 24 | 0.77 | **31** |
| Western | 2 | 66.7 | **1** | 33.3 | **3** | 1 | 33.3 | 2 | 66.7 | **3** | 6 | 46.2 | 7 | 0.54 | **13** |
| Mekelle | 5 | 41.7 | **7** | 58.3 | **12** | - | - | - | - | **-** | - | - | - | - | **-** |
| Total | **15** | 34.1 | **29** | 65.9 | **44** | **15** | 30.6 | **34** | 69.4 | **49** | 135 | 37.7 | **223** | 0.62 | **358** |

Table 3.9.26: Response of Households on participation of women in irrigation activities

| | Urban | | | | | Infant town | | | | | Rural | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Zone | No | | Yes | | Total | zone | No | | Yes | | Total | zone | No | | Yes | | Total |
| | #HOUSEHOLDs | % | #HOUSEHOLDs | % | | | #HOUSEHOLDs | % | #HOUSEHOLDs | % | | | #HOUSEHOLDs | % | #HOUSEHOLDs | % | |
| Southern | 2 | 28.6 | 5 | 71.4 | **7** | Central | 1 | 11.1 | 8 | 88.9 | **9** | Central | 36 | 29.0 | 88 | 71.0 | **124** |
| Mekelle | 2 | 13.3 | 13 | 86.7 | **15** | Eastern | 5 | 41.7 | 7 | 58.3 | **12** | Eastern | 20 | 27.0 | 54 | 73.0 | **74** |
| Eastern | 1 | 25.0 | 3 | 75.0 | **4** | N.West | 4 | 36.4 | 7 | 63.6 | **11** | N. west | 17 | 34.0 | 33 | 66.0 | **50** |
| Central | 3 | 21.4 | 11 | 78.6 | **14** | south | 3 | 23.1 | 10 | 76.9 | **13** | south | 26 | 31.3 | 57 | 68.7 | **83** |
| Western | 0 | 0.0 | 3 | 100.0 | **3** | S.East | | 0.0 | 4 | 100.0 | **4** | S. East | 8 | 25.8 | 23 | 74.2 | **31** |
| N. Western | 3 | 60.0 | 2 | 40.0 | **5** | west | 1 | 33.3 | 2 | 66.7 | **3** | West | 7 | 53.8 | 6 | 46.2 | **13** |
| **Total** | **11** | **22.9** | **37** | **77.1** | **48** | **total** | **14** | **26.9** | **38** | **73.1** | **52** | **Total** | **114** | **30.4** | **261** | **69.6** | **375** |

Appendix Table 3.9.27: Responses of households (HOUSEHOLDs) on Water Users Association (WUA), by zone

| | Urban | | | | | infant town | | | | | Rural | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| zone | No | | Yes | | Total | No | | Yes | | Total | No | | Yes | | Total |
| | #HOUSEHOLDs | % | #HOUSEHOLDs | % | | #HOUSEHOLDs | % | #HOUSEHOLDs | % | | #HOUSEHOLDs | % | #HOUSEHOLDs | % | |
| Central | 6 | 42.9 | 8 | 57.1 | 14 | 9 | 100 | - | - | 9 | 95 | 76.6 | 29 | 23.4 | 124 |
| Eastern | 2 | 66.7 | 1 | 33.3 | 3 | 7 | 58.3 | 5 | 41.7 | 12 | 57 | 77.0 | 17 | 23.0 | 74 |
| N.Western | 5 | 100.0 | - | 0.0 | 5 | 9 | 81.8 | 2 | 18.2 | 11 | 42 | 84.0 | 8 | 16 | 50 |
| Southern | 3 | 50.0 | 3 | 50.0 | 6 | 10 | 76.9 | 3 | 23.1 | 13 | 52 | 62.7 | 31 | 37.3 | 83 |
| S.East | - | - | - | - | - | 3 | 75.0 | 1 | 25.0 | 4 | 23 | 74.2 | 8 | 25.8 | 31 |
| Western | 2 | 66.7 | 1 | 33.3 | 3 | 3 | 100.0 | - | - | 3 | 10 | 76.9 | 3 | 23.1 | 13 |
| Mekelle | 11 | 78.6 | 3 | 21.4 | 14 | - | - | - | - | - | - | - | - | - | - |
| **Total** | **29** | **126.1** | **16** | **69.6** | **23** | **41** | **78.8** | **11** | **21.2** | **52** | **279** | 74.4 | **96** | **25.6** | **375** |

Appendix Table 3.9.28: Responses of households (HOUSEHOLDs) on problems facing the irrigation schemes, by zone

| Zone | Lack of Water availability | | Operation and maintenance | | Social conflict | | Transport (market) | | Salinity/sodicity | | Fertility problems | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | #HOUSEHOLDs | % | #HOUSEHOLDs | % | #HOUSEHOLDs | % | #HOUSEHOLDs | % | #HOUSEHOLDs | % | #HOUSEHOLDs | % | |
| **Urban** | | | | | | | | | | | | | |
| Southern | 4 | 57.1 | 1 | 14.3 | - | 0 | 2 | 28.6 | - | 0 | 0 | 0 | 7 |
| Mekelle | 9 | 47.4 | 2 | 10.5 | 1 | 5.3 | 2 | 10.5 | 1 | 5.3 | 4 | 21.1 | 19 |
| Eastern | 1 | 14.3 | 1 | 14.3 | 1 | 14.3 | 2 | 28.6 | 1 | 14.3 | 1 | 14.3 | 7 |
| Central | 6 | 26.1 | 4 | 17.4 | 5 | 21.7 | 4 | 17.4 | 1 | 4.3 | 3 | 13.0 | 23 |
| N.West | 3 | 50.0 | 1 | 16.7 | 0 | 0.0 | 2 | 33.3 | - | 0.0 | 0 | 0.0 | 6 |
| North Western | 4 | 80.0 | - | - | - | - | - | - | - | - | 1 | 20.0 | 5 |
| **total** | **27** | **40.3** | **9** | **13.4** | **7** | **10.4** | **12** | **17.9** | **3** | **4.5** | **9** | **13.4** | **67** |
| **Infant** | | | | | | | | | | | | | |
| Central | 4 | 14.8 | 6 | 22.2 | 8 | 29.6 | 7 | 25.9 | - | 0.0 | 2 | 7.4 | 27 |
| East | 6 | 16.7 | 7 | 19.4 | 8 | 22.2 | 7 | 19.4 | 2 | 5.6 | 6 | 16.7 | 36 |
| N.west | 10 | 30.3 | 5 | 15.2 | 7 | 21.2 | 3 | 9.1 | 1 | 3.0 | 7 | 21.2 | 33 |
| South | 15 | 38.5 | 8 | 20.5 | 7 | 17.9 | 3 | 7.7 | 2 | 5.1 | 4 | 10.3 | 39 |
| South east | 3 | 25.0 | 2 | 16.7 | - | - | 1 | 8.3 | 2 | 16.7 | 4 | 33.3 | 12 |
| Western | - | - | 1 | 11.1 | 1 | 11.1 | 3 | 33.3 | - | - | 4 | 44.4 | 9 |
| **Total** | **38** | **24.4** | **29** | **18.6** | **31** | **19.9** | **24** | **15.4** | **7** | **4.5** | **27** | **17.3** | **156** |
| **Rural** | | | | | | | | | | | | | |
| Central | 80 | 22.5 | 72 | 20.2 | 70 | 19.7 | 82 | 23.0 | 17 | 4.8 | 35 | 9.8 | 356 |
| East | 58 | 27.9 | 35 | 16.8 | 42 | 20.2 | 37 | 17.8 | 6 | 2.9 | 30 | 14.4 | 208 |
| N.West | 47 | 32.4 | 17 | 11.7 | 33 | 22.8 | 29 | 20.0 | 1 | 0.7 | 18 | 12.4 | 145 |
| South | 76 | 31.7 | 38 | 15.8 | 55 | 22.9 | 36 | 15.0 | 10 | 4.2 | 25 | 10.4 | 240 |
| S.East | 15 | 16.9 | 21 | 23.6 | 17 | 19.1 | 22 | 24.7 | 4 | 4.5 | 10 | 11.2 | 89 |
| Western | 7 | 19.4 | 3 | 8.3 | 5 | 13.9 | 10 | 27.8 | 2 | 5.6 | 9 | 25 | 36 |
| **Total** | **283** | **26.4** | **186** | **17.3** | **222** | **20.7** | **216** | **20.1** | **40** | **3.7** | **127** | **11.8** | **1074** |

Appendix:3.10.1. Zonal distributions of females by reproductive age

| No of died children by Zone | 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-59 | T0tal |
|---|---|---|---|---|---|---|---|---|
| Southern | 9 | 55 | 100 | 89 | 79 | 63 | 60 | 455 |
| Mekelle | 12 | 150 | 261 | 212 | 213 | 131 | 141 | 1120 |
| Eastern | 2 | 27 | 59 | 70 | 56 | 57 | 46 | 517 |
| Central | 0 | 28 | 67 | 86 | 112 | 98 | 62 | 453 |
| Western | 1 | 21 | 47 | 35 | 36 | 33 | 12 | 185 |
| North western | 4 | 40 | 82 | 65 | 67 | 39 | 26 | 323 |
| Total | 28 | 321 | 616 | 557 | 563 | 421 | 347 | 2853 |

Appendix3.10.2. Distribution of live children by HOUSEHOLDs

| No of live children by Zone | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Central | 172 | 294 | 325 | 308 | 323 | 304 | 207 | 114 | 45 | 7 | 4 | 1 | 2104 |
| Eastern | 155 | 208 | 223 | 267 | 247 | 212 | 147 | 83 | 38 | 8 | 1 | 0 | 1589 |
| North west | 166 | 198 | 220 | 252 | 205 | 167 | 111 | 54 | 33 | 8 | 5 | 0 | 1419 |
| South | 164 | 220 | 219 | 189 | 152 | 127 | 77 | 32 | 8 | 5 | 0 | 0 | 1193 |
| South east | 73 | 117 | 122 | 119 | 105 | 112 | 50 | 32 | 12 | 1 | 0 | 0 | 743 |
| western | 117 | 114 | 121 | 121 | 94 | 46 | 34 | 19 | 13 | 6 | 3 | 0 | 688 |
| Total | 847 | 1151 | 1230 | 1256 | 1126 | 968 | 626 | 334 | 149 | 35 | 13 | 1 | 7736 |

Appendix3.10.3. distribution of died children by HOUSEHOLDs

| No of died children by Zone | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 12 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Central | 178 | 78 | 35 | 11 | 12 | 9 | 0 | 1 | 0 | 0 | 1 | 325 |
| Eastern | 165 | 63 | 17 | 9 | 6 | 3 | 1 | 3 | 0 | 0 | 0 | 267 |
| North west | 145 | 48 | 33 | 12 | 3 | 5 | 1 | 2 | 2 | 0 | 0 | 251 |
| South | 96 | 59 | 40 | 24 | 14 | 6 | 4 | 2 | 0 | 0 | 0 | 245 |
| South east | 75 | 28 | 15 | 11 | 8 | 12 | 3 | 1 | 0 | 0 | 0 | 153 |
| western | 63 | 19 | 10 | 2 | 3 | 3 | 1 | 2 | 0 | 0 | 0 | 103 |
| Total | 722 | 295 | 150 | 69 | 46 | 38 | 9 | 11 | 2 | 1 | 1 | 1344 |

Appendix 3.10.4. Pregnancy status by zone

| Status of preg by Zone | Yes (%) | No (%) |
|---|---|---|
| Central | 90 (4.11) | 2099 (95.89) |
| Eastern | 59 (3.53) | 1613 (96.47) |
| North west | 81 (5.45) | 1406 (94.55) |
| South | 72 (5.66) | 1201 (94.34) |
| South east | 47 (6.01) | 735 (93.99) |
| western | 34 (4.65) | 697 (95.35) |
| Total | 384 (4.72) | 7751 (95.29) |

Appendix3.10.5. Wanted pregnancies by zone

| Status of wanted pregnancy by Zone | Yes (%) | Later (%) | No (%) |
|---|---|---|---|
| Central | 87 | 1 | 2 |
| Eastern | 57 | 0 | 2 |
| North west | 72 | 2 | 7 |
| South | 67 | 2 | 3 |
| South east | 46 | 0 | 3 |
| western | 28 | 2 | 2 |
| Total | 357 | 7 | 19 |

Appendix 3.10.6. Interest on last child by zone

| Interest on last child | Yes (%) | Later (%) | No (%) |
|---|---|---|---|
| Central | 2076 | 20 | 93 |
| Eastern | 1566 | 24 | 82 |
| North west | 1390 | 19 | 78 |
| South | 1180 | 10 | 83 |
| South east | 726 | 13 | 43 |
| western | 672 | 6 | 432 |
| Total | 7610 | 92 | 432 |

Appendix 3.10.7. Knowledge about FP by zone

| Knowledge about FP | Yes (%) | No (%) |
|---|---|---|
| Central | 1103 | 1086 |
| Eastern | 871 | 801 |
| North west | 886 | 601 |
| South | 725 | 549 |
| South east | 441 | 342 |
| western | 462 | 269 |
| Total | 4488 | 3648 |

Appendix 3.10.8. Ever used Family Planning by zone

| Ever used FP by Zone | Yes (%) | No (%) |
|---|---|---|
| Central | 824 (18.36) | 279 (6.22) |
| Eastern | 680 (15.15) | 191 (4.26) |
| North west | 688 (15.33) | 198 (4.41) |
| South | 568 (12.66) | 157 (3.5) |
| South east | 320 (7.13) | 121 (2.7) |
| western | 389 (8.67) | 73 (1.63) |
| Total | 3469 (77.3) | 1019 (22.7) |

Appendix 3.10.9. Type of family planning ever used

| Type of family planning ever used by Zone | Abstinence | Calendar | Condom | Pills | loop | In plant | Depo | Others |
|---|---|---|---|---|---|---|---|---|
| Central | 25 | 6 | 15 | 130 | 6 | 77 | 561 | 4 |
| Eastern | 8 | 4 | 4 | 111 | 2 | 71 | 474 | 6 |
| North west | 7 | 8 | 4 | 70 | 4 | 126 | 469 | 0 |
| South | 6 | 0 | 6 | 93 | 5 | 35 | 420 | 2 |
| South east | 1 | 1 | 1 | 32 | 5 | 37 | 242 | 0 |
| western | 3 | 2 | 2 | 56 | 3 | 68 | 255 | 0 |
| Total | 50 | 21 | 32 | 492 | 25 | 414 | 2421 | 12 |

Appendix 3.10.10.Reasons for FP use

| Reason why FP is being used by Zone | To prevent pregnancy | To make gap | Total |
|---|---|---|---|
| Central | 67 | 757 | 824 |
| Eastern | 77 | 603 | 680 |
| North west | 74 | 614 | 688 |
| South | 119 | 449 | 568 |
| South east | 43 | 277 | 320 |
| western | 61 | 328 | 389 |
| Total | 441 | 3028 | 3469 |

Appendix 3.10.11. ANC during last pregnancy

| ANC during last pregnancy by Zone | Yes | No | Total |
|---|---|---|---|
| Central | 1208 | 917 | 2125 |
| Eastern | 922 | 708 | 1630 |
| North west | 877 | 562 | 1439 |
| South | 702 | 571 | 1273 |
| South east | 457 | 309 | 766 |
| western | 453 | 253 | 706 |
| Total | 4619 | 3320 | 7939 |

Appendix 3.10.12.Professionals or practitioners following ANC

| Who followed ANC | Health professional | HEWs | TTBA | TBA | Family ,neighbor s | No one | Others | Total |
|---|---|---|---|---|---|---|---|---|
| Central | 968 | 158 | 58 | 1 | 20 | 3 | 0 | 1208 |
| Eastern | 784 | 96 | 25 | 1 | 12 | 1 | 3 | 922 |
| North west | 656 | 175 | 43 | 1 | 2 | 0 | 0 | 877 |
| South | 591 | 101 | 5 | 1 | 3 | 1 | 0 | 702 |
| South east | 398 | 53 | 2 | 0 | 4 | 0 | 0 | 457 |
| western | 363 | 56 | 28 | 1 | 3 | 2 | 0 | 453 |
| Total | 3760 | 639 | 161 | 5 | 44 | 7 | 3 | 4619 |

Appendix 3.10.13.Place of follow up for ANC

| Where did you followed ANC | My house | Public hospitals | Public health centers | Public health posts | Private hospital, clinics | Total |
|---|---|---|---|---|---|---|
| Central | 32 | 217 | 772 | 182 | 5 | 1208 |
| Eastern | 27 | 217 | 574 | 96 | 8 | 922 |
| North west | 9 | 128 | 661 | 75 | 4 | 877 |
| South | 15 | 68 | 503 | 105 | 11 | 702 |
| South east | 7 | 28 | 384 | 37 | 1 | 457 |
| Western | 8 | 126 | 284 | 31 | 4 | 453 |
| Total | 98 | 784 | 3178 | 526 | 33 | 4619 |

Appendix 3.10.14. Time ANC started

| Gestation age started following ANC | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Central | 18 | 72 | 325 | 314 | 203 | 220 | 28 | 12 | 5 | 1197 |
| Eastern | 19 | 59 | 271 | 271 | 136 | 140 | 10 | 10 | 0 | 916 |
| North west | 13 | 48 | 259 | 270 | 155 | 106 | 16 | 9 | 1 | 877 |
| South | 8 | 57 | 276 | 184 | 98 | 62 | 13 | 1 | 0 | 699 |
| South east | 6 | 32 | 159 | 129 | 78 | 44 | 6 | 2 | 0 | 456 |
| Western | 12 | 38 | 146 | 139 | 60 | 47 | 6 | 5 | 0 | 453 |
| Total | 76 | 306 | 306 | 1307 | 730 | 619 | 79 | 39 | 6 | 4598 |

Appendix 3.10.15. Place of delivery

| Where did delivered | My house | Public hospital | Public health center | Public health posts | Private hospital ,clinics |
|---|---|---|---|---|---|
| Central | 1070 | 245 | 691 | 90 | 12 |
| Eastern | 720 | 286 | 519 | 57 | 11 |
| North west | 689 | 176 | 512 | 42 | 7 |
| South | 654 | 82 | 394 | 66 | 30 |
| South east | 378 | 33 | 321 | 17 | 6 |
| Western | 320 | 161 | 200 | 12 | 13 |
| Total | 3831 | 983 | 2637 | 284 | 79 |

Appendix3.10.16. PNC follow up by zone

| PNC by zone | Yes | No | Total |
|---|---|---|---|
| Central | 925 | 1184 | 2109 |
| Eastern | 735 | 863 | 1598 |
| North west | 599 | 827 | 1426 |
| South | 470 | 763 | 1233 |
| South east | 271 | 484 | 755 |
| Western | 342 | 353 | 695 |
| Total | 3342 | 4474 | 7816 |

Appendix 3.10.17. Professionals following PNC

| Who followed PNC by Zone | Health professional | HEWs | TTBA | TBA | Family, neighbor | No one | Others | Total |
|---|---|---|---|---|---|---|---|---|
| Central | 603 | 108 | 19 | 2 | 189 | 2 | 1 | 924 |
| Eastern | 449 | 72 | 12 | 0 | 98 | 0 | 3 | 734 |
| North west | 414 | 100 | 29 | 3 | 46 | 5 | 2 | 599 |
| South | 312 | 130 | 4 | 0 | 9 | 8 | 9 | 472 |
| South east | 199 | 64 | 2 | 0 | 4 | 0 | 0 | 269 |
| Western | 233 | 44 | 24 | 0 | 37 | 3 | 1 | 342 |
| Total | 2310 | 518 | 90 | 5 | 383 | 18 | 16 | 3340 |

Appendix 3.10.18. Breast feeding

| Breast feeding started by Zone | Within30 minutes | Within1 hr | Within 1 day | After 1 day | Total |
|---|---|---|---|---|---|
| Central | 685 | 89 | 21 | 5 | 800 |
| Eastern | 497 | 49 | 10 | 6 | 562 |
| North west | 495 | 90 | 55 | 21 | 661 |
| South | 373 | 115 | 14 | 15 | 517 |
| South east | 225 | 91 | 11 | 7 | 334 |
| Western | 254 | 46 | 21 | 11 | 332 |
| Total | 2529 | 480 | 132 | 65 | 3206 |

Appendix3.10.19. Breast feeding practice by zone

| Breast feeding practice Zone | Yes | No | Total |
|---|---|---|---|
| Central | 788 | 58 | 846 |
| Eastern | 537 | 44 | 581 |
| North west | 661 | 5 | 666 |
| South | 474 | 46 | 520 |
| South east | 327 | 19 | 346 |
| Western | 332 | 1 | 333 |
| Total | 3119 | 173 | 3292 |

Appendix3.10.20. Colostrum discharge practice

| Colostrum discharge practice by Zone | Yes | No | Total |
|---|---|---|---|
| Central | 206 | 582 | 788 |
| Eastern | 162 | 375 | 537 |
| North west | 140 | 521 | 661 |
| South | 121 | 353 | 474 |
| South east | 61 | 266 | 327 |
| Western | 77 | 255 | 332 |
| Total | 767 | 2352 | 3119 |

Appendix3.10.21. Food supplement by zone to 6 months age children

| Supplementary food | Yes | No | Total |
|---|---|---|---|
| Central | 105 | 46 | 151 |
| Eastern | 29 | 20 | 49 |
| North west | 100 | 54 | 154 |
| South | 2 | 3 | 5 |
| South east | 57 | 15 | 72 |
| Western | 17 | 14 | 31 |
| Total | 310 | 152 | 462 |

Appendix 3.10.22.Distribution zones by vaccination cards

| Availability of vaccine cards | Yes | No | Total |
|---|---|---|---|
| Central | 409 | 1561 | 1970 |
| Eastern | 376 | 1107 | 1483 |
| North west | 416 | 834 | 1250 |
| South | 151 | 1077 | 1228 |
| South east | 92 | 668 | 760 |
| Western | 191 | 411 | 601 |
| Total | 1635 | 5658 | 7293 |

Appendix 3.10.23.Distribution of zones by CBHI users

| CBHI by Zoba | Yes | No | Total |
|---|---|---|---|
| Central | 978 | 1211 | 2189 |
| Eastern | 1994 | 666 | 1670 |
| North west | 700 | 787 | 1487 |
| South | 620 | 654 | 1274 |
| South east | 213 | 569 | 782 |
| Western | 183 | 548 | 731 |
| Total | 3698 | 4435 | 8133 |

Appendix 3.10.24. Reason for not using CBHI

| Reasons for not using CBHI by Zoba | Luck of awareness | No money to pay | The service is not available | I don't know | Total |
|---|---|---|---|---|---|
| Central | 597 | 393 | 150 | 69 | 1209 |
| Eastern | 317 | 230 | 64 | 37 | 648 |
| North west | 349 | 282 | 87 | 69 | 787 |
| South | 395 | 166 | 27 | 43 | 631 |
| South east | 326 | 186 | 18 | 36 | 566 |
| Western | 314 | 99 | 72 | 63 | 548 |
| Total | 2298 | 1356 | 418 | 317 | 4389 |

Appendix 3.10.25. Harmful traditional knowledge

| Knowledge of HTP by Zoba | Yes | No | Total |
|---|---|---|---|
| Central | 1370 | 819 | 2189 |
| Eastern | 890 | 782 | 1672 |
| North west | 785 | 700 | 1485 |
| South | 485 | 788 | 1273 |
| South east | 338 | 445 | 783 |
| Western | 398 | 333 | 731 |
| Total | 4266 | 3867 | 8133 |

Appendix 3.10.26. Distribution of circumcision by zone

| Distribution of circumcision by Zoba | Yes | No | Total |
|---|---|---|---|
| Central | 21 | 1349 | 1370 |
| Eastern | 5 | 883 | 888 |
| North west | 18 | 765 | 783 |
| South | 116 | 369 | 485 |
| South east | 36 | 302 | 338 |
| Western | 51 | 347 | 398 |
| Total | 247 | 4015 | 4262 |

Appendix 3.10.27. Distribution of circumcision practitioners by zoba

| Practice of circumcision by Zoba | Traditional circumciser | TBA | I Health professional know | I don't know | Total |
|---|---|---|---|---|---|
| Central | 18 | 1 | 2 | 0 | 21 |
| Eastern | 3 | 0 | 0 | 2 | 5 |
| North west | 18 | 0 | 0 | 0 | 18 |
| South | 109 | 2 | 0 | 3 | 114 |
| South east | 36 | 0 | 0 | 0 | 36 |
| Western | 51 | 0 | 0 | 0 | 51 |
| Total | 235 | 3 | 2 | 5 | 245 |

Appendix 3.10.28.Distribution of uvula cutting by zone

| Distribution of uvula cutting by Zoba | Yes | No | Total |
|---|---|---|---|
| Central | 1216 | 154 | 1370 |
| Eastern | 778 | 110 | 888 |
| North west | 676 | 109 | 785 |
| South | 397 | 88 | 485 |
| South east | 269 | 69 | 338 |
| Western | 330 | 68 | 398 |
| Total | 3666 | 598 | 4264 |

Appendix 3.10.29. Distribution of ovule cutting practice by zoba

| Who practice it by Zoba | Traditional circumciser | TBA | I Health professional know | I don't know | total |
|---|---|---|---|---|---|
| Central | 1144 | 22 | 38 | 11 | 1215 |
| Eastern | 725 | 11 | 35 | 7 | 778 |
| North west | 644 | 21 | 9 | 2 | 676 |
| South | 382 | 5 | 5 | 5 | 397 |
| South east | 266 | 3 | 1 | 0 | 270 |
| Western | 325 | 3 | 2 | 0 | 330 |
| Total | 3486 | 65 | 90 | 25 | 3666 |

Appendix 3.10.30. Knowledge of rape by zone

| Heard about rape | Yes | No | Total |
|---|---|---|---|
| Central | 779 | 589 | 1368 |
| Eastern | 541 | 346 | 887 |
| North west | 357 | 428 | 785 |
| South | 306 | 179 | 485 |
| South east | 190 | 148 | 338 |
| Western | 181 | 217 | 398 |
| Total | 2354 | 1907 | 4261 |

Appendix 3.10.31. Information about rape

| Practice of rape | Yes | No | Total |
|---|---|---|---|
| Central | 127 | 652 | 779 |
| Eastern | 69 | 470 | 539 |
| North west | 114 | 243 | 357 |
| South | 59 | 247 | 306 |
| South east | 19 | 172 | 191 |
| Western | 79 | 102 | 181 |
| Total | 467 | 1886 | 2353 |

Appendix 3.10.32. Information about fistula

| Heard about fistula | Yes | No | Total |
|---|---|---|---|
| Central | 461 | 1727 | 2188 |
| Eastern | 422 | 1237 | 1659 |
| North west | 377 | 1109 | 1486 |
| South | 332 | 937 | 1269 |
| South east | 215 | 567 | 782 |
| Western | 214 | 516 | 730 |
| Total | 2021 | 6093 | 8114 |

Appendix 3.10.33. Distribution of fistula cases by zone

| Number of fistula cases | Yes | No | Total |
|---|---|---|---|
| Central | 8 | 452 | 460 |
| Eastern | 1 | 417 | 418 |
| North west | 10 | 367 | 377 |
| South | 9 | 321 | 330 |
| South east | 3 | 212 | 215 |
| Western | 5 | 209 | 214 |
| Total | 36 | 1978 | 2014 |

Appendix Table 3.11.1. housing condition by zone

| Type of house | CIS | Hidmo | Villa | G+1 separated | G+1 attached | G+2 and above separated | G+2 and above attached | Others |
|---|---|---|---|---|---|---|---|---|
| Central | 1293 | 679 | 125 | 79 | 3 | 3 | 0 | 9 |
| Eastern | 939 | 642 | 14 | 70 | 3 | 0 | 0 | 6 |
| North west | 1083 | 296 | 62 | 17 | 16 | 2 | 1 | 10 |
| South | 642 | 452 | 119 | 29 | 14 | 8 | 4 | 6 |
| South east | 369 | 297 | 74 | 31 | 6 | 3 | 2 | 3 |
| western | 609 | 17 | 95 | 4 | 1 | 2 | 0 | 3 |
| Total | 4935 | 2383 | 489 | 230 | 43 | 18 | 7 | 37 |

Appendix 3.11.2. Distribution of ownership of housing

| Ownership of house | Ownership | Rented from kebele, govt | Rented from private | Given from employee | Given from employee with reasonable cost | Others |
|---|---|---|---|---|---|---|
| Central | 1906 | 8 | 155 | 6 | 0 | 114 |
| Eastern | 1378 | 6 | 179 | 2 | 0 | 107 |
| North west | 1231 | 7 | 187 | 8 | 0 | 54 |
| South | 1132 | 2 | 87 | 1 | 2 | 50 |
| South east | 702 | 1 | 63 | 0 | 0 | 19 |
| western | 576 | 3 | 125 | 0 | 1 | 26 |
| Total | 6925 | 27 | 796 | 17 | 3 | 370 |

Appendix 3.11.3. Distribution of households by construction material of wall

| Material of wall | Brick and cement | Stone and cement | Stone and mud | Blocket and cement | Wood and mud | Wood and grass | others |
|---|---|---|---|---|---|---|---|
| Central | 33 | 269 | 1777 | 51 | 32 | 14 | 13 |
| Eastern | 31 | 272 | 1273 | 57 | 30 | 1 | 8 |
| North west | 37 | 106 | 1127 | 49 | 153 | 2 | 13 |
| South | 7 | 19 | 430 | 5 | 777 | 32 | 4 |
| South east | 9 | 51 | 584 | 20 | 117 | 3 | 1 |
| Western | 18 | 25 | 249 | 30 | 251 | 24 | 134 |
| Total | 135 | 742 | 5440 | 212 | 1360 | 76 | 173 |

Appendix3. 11.4. Distribution of households by construction materials of roof

| Material of roof | CIS | Concrete and cement | Grass | Wood and mud | Wood ,mud, grass and stone | Others |
|---|---|---|---|---|---|---|
| Central | 1408 | 10 | 124 | 522 | 113 | 12 |
| Eastern | 1025 | 6 | 14 | 543 | 77 | 7 |
| North west | 1104 | 25 | 65 | 220 | 55 | 18 |
| South | 937 | 2 | 270 | 40 | 17 | 8 |
| South east | 543 | 2 | 56 | 111 | 65 | 8 |
| Western | 610 | 10 | 88 | 11 | 5 | 7 |
| Total | 5627 | 55 | 617 | 1447 | 332 | 60 |

Appendix 3.11.5. Distribution of households by construction materials of floor

| Material of floor | CIS | Concrete and cement | Grass | Wood and mud | Wood ,mud, grass and stone | Others |
|---|---|---|---|---|---|---|
| Central | 1874 | 3 | 278 | 0 | 28 | 6 |
| Eastern | 1315 | 4 | 333 | 2 | 15 | 3 |
| North west | 1309 | 7 | 148 | 1 | 18 | 4 |
| South | 1225 | 7 | 36 | 1 | 2 | 3 |
| South east | 706 | 3 | 65 | 1 | 10 | 0 |
| Western | 666 | 4 | 52 | 2 | 4 | 3 |
| Total | 7095 | 28 | 912 | 7 | 77 | 19 |

Appendix 3.11.6. Distribution of households by kitchen type

| Material of floor | Modern | Modern shared | Traditional private | Traditional shared | No kitchen | Other |
|---|---|---|---|---|---|---|
| Central | 101 | 24 | 1550 | 67 | 443 | 6 |
| Eastern | 96 | 39 | 1192 | 75 | 268 | 4 |
| North west | 41 | 11 | 862 | 78 | 491 | 4 |
| South | 21 | 12 | 793 | 66 | 371 | 11 |
| South east | 15 | 7 | 560 | 21 | 181 | 1 |
| Western | 22 | 7 | 409 | 42 | 243 | 8 |
| Total | 296 | 100 | 5366 | 349 | 1997 | 34 |

Appendix 3.11.7. Distribution of households by separate bed room

| Separate bed room | Yes | No | Total |
|---|---|---|---|
| Central | 779 | 1410 | 2189 |
| Eastern | 578 | 1094 | 1672 |
| North west | 794 | 693 | 1487 |
| South | 531 | 743 | 1274 |
| South east | 310 | 475 | 785 |
| Western | 354 | 377 | 731 |
| Total | 3346 | 4792 | 8138 |

Appendix 3.11.8. Distribution of household by type of latrine

| Type of latrine | Dry pit latrine | VIP | Water flush latrine | Public latrine | Open field/bush | Other |
|---|---|---|---|---|---|---|
| Central | 2 | 3 | 0 | 0 | 3 | 0 |
| Eastern | 3 | 0 | 0 | 0 | 1 | 0 |
| North west | 554 | 61 | 22 | 4 | 823 | 23 |
| South | 535 | 30 | 8 | 1 | 680 | 19 |
| South east | 356 | 25 | 7 | 0 | 394 | 2 |
| Western | 311 | 46 | 21 | 2 | 328 | 23 |
| Total | 1761 | 165 | 58 | 7 | 2229 | 67 |

Appendix 3.11.9. Distribution of households by waste management type

| Means of waste mgt | Municipality | Private organization | Disposed to open field | Disposed to river | Burned | Other |
|---|---|---|---|---|---|---|
| Central | 306 | 17 | 1201 | 409 | 199 | 57 |
| Eastern | 288 | 32 | 811 | 334 | 158 | 49 |
| North west | 218 | 13 | 769 | 178 | 254 | 55 |
| South | 85 | 12 | 695 | 254 | 137 | 90 |
| South east | 52 | 8 | 484 | 130 | 54 | 55 |
| Western | 182 | 18 | 327 | 73 | 114 | 17 |
| Total | 1131 | 100 | 4287 | 1378 | 916 | 323 |

Appendix 3.11.10. Distribution of households by Telephone access

| Telephone access | Within the house | In neighbor | Five minutes from the house | Greater than five minutes from the house | We are not users | Other |
|---|---|---|---|---|---|---|
| Central | 370 | 65 | 9 | 48 | 1536 | 161 |
| Eastern | 361 | 50 | 12 | 30 | 1075 | 144 |
| North west | 639 | 280 | 19 | 48 | 465 | 36 |
| South | 321 | 128 | 13 | 16 | 660 | 135 |
| South east | 160 | 72 | 8 | 7 | 428 | 107 |
| Western | 435 | 91 | 4 | 18 | 156 | 27 |
| Total | 2286 | 686 | 65 | 167 | 4320 | 610 |

Appendix 3.11.11. Distribution of households by access to Health facility

| Access to health facility | Yes | No | I don't know | Total |
|---|---|---|---|---|
| Central | 2046 | 112 | 31 | 2189 |
| Eastern | 1557 | 92 | 23 | 1672 |
| North west | 1391 | 81 | 15 | 1487 |
| South | 1196 | 64 | 14 | 1274 |
| South east | 752 | 28 | 5 | 785 |
| western | 685 | 43 | 3 | 731 |
| Total | 7627 | 420 | 91 | 8138 |

Appendix 3.11.12. Distribution of households by the nearest Health facility

| Nearest health facility | Health post | Health center | Government hospital | NGO health facilities | Private clinics | Others |
|---|---|---|---|---|---|---|
| Central | 1008 | 1076 | 79 | 5 | 2 | 19 |
| Eastern | 582 | 975 | 92 | 0 | 11 | 12 |
| North west | 590 | 843 | 27 | 1 | 17 | 9 |
| South | 618 | 630 | 14 | 4 | 0 | 7 |
| South east | 391 | 364 | 22 | 0 | 0 | 5 |
| western | 245 | 457 | 18 | 0 | 7 | 4 |
| Total | 3434 | 4345 | 252 | 10 | 37 | 56 |

Appendix 3.11.13.Distance taken to reach health post

| Distance in minutes to health post | <=30 minutes | 31-60 minutes | 61-120 minutes | >=121 minutes | I don't know |
|---|---|---|---|---|---|
| Central | 1616 | 393 | 146 | 34 | 0 |
| Eastern | 1288 | 259 | 95 | 30 | 0 |
| North west | 1197 | 195 | 67 | 28 | 0 |
| South | 994 | 192 | 68 | 11 | 9 |
| South east | 634 | 96 | 41 | 11 | 3 |
| western | 623 | 73 | 23 | 12 | 0 |
| Total | 6352 | 1208 | 440 | 126 | 12 |

Appendix 3.11.14. Distance taken to reach health post

| Distance in minutes to health center | <=30 minutes | 31-60 minutes | 61-120 minutes | >=121 minutes | Total |
|---|---|---|---|---|---|
| Central | 1085 | 424 | 460 | 220 | 2189 |
| Eastern | 1006 | 300 | 253 | 113 | 1672 |
| North west | 790 | 310 | 216 | 171 | 1487 |
| South | 700 | 246 | 229 | 99 | 1274 |
| South east | 414 | 168 | 134 | 69 | 785 |
| western | 464 | 87 | 107 | 73 | 731 |
| Total | 4459 | 1535 | 1399 | 745 | 8138 |

Appendix 3.11.15. Knowledge of HOUSEHOLDs to HEWs

| Knowledge to HEWs | Yes | No | Total |
|---|---|---|---|
| Central | 1535 | 654 | 2189 |
| Eastern | 1141 | 531 | 1672 |
| North west | 1046 | 441 | 1487 |
| South | 948 | 326 | 1274 |
| South east | 586 | 197 | 783 |
| western | 489 | 242 | 731 |
| Total | 5745 | 2391 | 8136 |

Appendix 3.11.16.HOUSEHOLDs Visit by HEWs

| Visit by HEWs | Yes | No | Total |
|---|---|---|---|
| Central | 1271 | 264 | 1535 |
| Eastern | 996 | 145 | 1141 |
| North west | 921 | 125 | 1046 |
| South | 868 | 80 | 948 |
| South east | 513 | 72 | 585 |
| western | 432 | 57 | 489 |
| Total | 5001 | 743 | 5744 |

Appendix3.11.17. HOUSEHOLDs last visit by HEWs

| last visit by HEWs | In the last one month | In the last two to three months | More than three months | Total |
|---|---|---|---|---|
| Central | 325 | 410 | 800 | 1535 |
| Eastern | 284 | 361 | 496 | 1141 |
| North west | 299 | 307 | 315 | 921 |
| South | 530 | 233 | 185 | 948 |
| South east | 286 | 149 | 150 | 585 |
| western | 146 | 152 | 134 | 432 |
| Total | 1870 | 1612 | 2080 | 5562 |

Appendix 3.11.18. HOUSEHOLDs trust to wards the services given by HEWs

| Trust to the services given by HEWs | Always | Some times | Not at all | Total |
|---|---|---|---|---|
| Central | 1191 | 266 | 78 | 1535 |
| Eastern | 905 | 198 | 38 | 1141 |
| North west | 849 | 169 | 28 | 1046 |
| South | 760 | 167 | 21 | 948 |
| South east | 465 | 95 | 26 | 586 |
| western | 375 | 94 | 20 | 489 |
| Total | 4545 | 989 | 211 | 5745 |

Appendix 3.11.19. HOUSEHOLDs knowledge to women development army

| Knowledge to WDA | Yes | No | Total |
|---|---|---|---|
| Central | 786 | 1403 | 2189 |
| Eastern | 619 | 1053 | 1672 |
| North west | 604 | 883 | 1487 |
| South | 700 | 574 | 1274 |
| South east | 439 | 344 | 783 |
| western | 288 | 443 | 731 |
| Total | 3436 | 4700 | 8136 |

Appendix 3.11.20. Distribution of Women development army's HOUSEHOLDs visit by zone

| Visit by WDA | Yes | No | Total |
|---|---|---|---|
| Central | 653 | 133 | 786 |
| Eastern | 542 | 77 | 619 |
| North west | 547 | 57 | 604 |
| South | 640 | 60 | 700 |
| South east | 384 | 55 | 439 |
| western | 269 | 19 | 288 |
| Total | 3035 | 401 | 3436 |

Appendix 3.11.21.Distribution of Women development army's HOUSEHOLDs last visit by zone

| last visit by WDA | In the last one month | In the last two to three months | More than three months | Total |
|---|---|---|---|---|
| Central | 190 | 199 | 397 | 786 |
| Eastern | 161 | 188 | 270 | 619 |
| North west | 214 | 190 | 143 | 547 |
| South | 408 | 164 | 128 | 700 |
| South east | 215 | 110 | 114 | 439 |
| western | 107 | 87 | 75 | 269 |
| Total | 1295 | 938 | 1127 | 3360 |

Appendix 3.11.22. HOUSEHOLDs trust to the services given by WDAs by zone

| Trust to the services given by WDA | Always | Some times | Not at all | Total |
|---|---|---|---|---|
| Central | 592 | 145 | 49 | 786 |
| Eastern | 481 | 116 | 22 | 619 |
| North west | 477 | 116 | 11 | 604 |
| South | 537 | 136 | 26 | 699 |
| South east | 343 | 68 | 27 | 438 |
| western | 223 | 52 | 13 | 288 |
| Total | 2653 | 633 | 148 | 3434 |