FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA CENTRAL STATISTICAL AGENCY

LARGE AND MEDIUM SCALE COMMERCIAL FARMS SAMPLE SURVEY 2014/15 (2007EC)

RESULTS AT COUNTRY AND REGIONAL LEVEL VOLUME VIII

STATISTICAL
REPORT ON

AREA AND PRODUCTION OF CROPS, AND FARM MANAGEMENT PRACTICES

STATISTICAL BULLETIN

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BACKGROUND

CHAPTER ONE

Agriculture is the primary activity in Ethiopia, where about 84 percent of the country's population engaged in various agricultural activities and generates its income for household consumption to sustain its livelihood. Moreover, the country generates the lion share of its foreign currency earnings from the sales/export of agricultural commodities abroad and currently the sector contributes about 42 percent to the country's GDP, and above all, the sector is believed to be the main source of capital to be accumulated for the process of establishing the future industrialized Ethiopia, which again shows the determinant role played by the sector to bring about sustainable economic development for the country in the years to come.

Ethiopian agriculture have suffered for years from the use of traditional farm implements and subsistence farming system as well as limited use of modern farm inputs, that resulted to the sector's poor performance (i.e. low productivity of the sector). However, the surplus production along with productivity increments that have been registered during the last six consecutive years, indicated that the agricultural system as a whole and the crop production sub sector in particular is showing improvement in terms of productivity, the extent and use of modern farm inputs, and modern farming system practices, etc.

Despite those bottlenecks that hampered the sector's productivity, Ethiopian agriculture, as it had been used for centuries in the past and till the present, the sector is believed to continue being the leading and determinant sector of the country's future economic development.

As mentioned earlier, improvements that have been registered in the overall performance of the agricultural sector, during earlier consecutive years, cannot be considered as an end by itself but could be taken as an indicator for the need of much more efforts to be made by the government and the concerned stakeholders to adopt

and implement the available modern and improved agricultural technologies that help attain enhanced productivity and maintain sustainable development of the sector. Thus, all efforts required to bring about the desired change/improvements on the overall performance of the agricultural sector as a whole, could

only be successful, if and only if policies, strategies, implementation plans and programs and related efforts are geared towards addressing the problems identified in the two agricultural sub- sectors. The two major agricultural sub sectors are:-

a) **Private agricultural holding;** this sub-sector includes rural-urban small and fragmented privately owned agricultural holdings on which all types of agricultural activities such as crop production, livestock rearing…etc, are performed by the operator/holders to obtain agricultural produce for self/family consumption and sometimes for sell. However, over

95 % of the annual gross total agricultural output of the country is said to be generated from this sub-sector,

b) **Commercial Farms**:- this sub-sector refers to the farms that include state and private commercial farms mainly established for the purpose of profit making by selling agricultural products at local market and/or abroad. These farms are commonly owned and operated by government, private companies and non-governmental institutions, such as private individual investors, share holders, religious and non- religious institutions...etc.

The sub-sector is mainly characterized by the use of relatively capital intensive, mechanized and market oriented farming system, with increased use of modern farm management practices and inputs such as, use of high tech-farm machineries and implements, irrigation scheme, use of chemical fertilizers, pesticides and improved seeds.

In Ethiopia, however, due to various reasons, commercial farms are not widely spread, and as a result of which the contribution of these farms to the country's gross total agricultural output is limited only to about 5 percent. According to some written documents, the introduction of Commercial farms in Ethiopia goes back to the Pre-Derg era, where government owned pilot state and research farms on the basis of Yugoslav model [MOSFD 1986-370], which pave the way for the establishment of

private commercial, state and institutional farms in Awassa, Arbaminch, Zeway and Shewarobit which latter on transformed into well organized and relatively mechanized large and medium scale state, private and institutional farms that are collectively called 'Commercial Farms' .

Since then, large and medium scale commercial farms in Ethiopia had been forced to be reorganized by undertaking various structural and organizational adjustments with varying legal status including ownership over a number of economic policy changes that took place over the

last three decades. Nevertheless, a decade has passed since the existing Commercial farms reorganized on the basis of market oriented economic policy adopted by the existing Federal Democratic Republic Government of Ethiopia.

This report is the eighth of its type, where the first one was published in the 2002/03 (1995 E.C.), presenting the results of the 2001/02 (1994 E.C.) and the second one was published in the

2008/2009(2001 E.C). During the years between 2002/03 (1995 E.C.) and 2008/2009(2001 E.C) Central Statistical Agency had conducted more than Six surveys on Commercial farms but failed to produce the results due to various reasons mainly due to unwillingness of respondents to give accurate information. However, after making a through revisions and improvements on the previously adopted questionnaires, the reports on data collection methodology, related survey documents and results in the years 2009/10 (2002 E.C.) and 2010/11 (2003EC) were also released, CSA conducted Large and Medium Scale Commercial farms sample survey covering the whole country.

This report, therefore, presents quantitative information on total area, volume of production and yield of major crops (temporary and permanent), and total crop area under different farm management practices as obtained and summarized from the results of the 2014/15 (2007 E.C.) commercial farms sample survey of the Meher Season.

1. Objectives of the 2014/15 (2007 E.C.) Large and Medium Scale Commercial

Farms Survey

The major objectives of the **2014/15 (2007 E.C.)** commercial farms sample survey is to provide:-

- Statistical data on crop area and volume of production by farm and crop type to fill-in the existing data gap,
- Detail data on various inputs applied for large and medium scale agricultural production mainly quantity of Chemical fertilizers, pesticides, insecticide improved seeds & indigenous seed.

The provision of the above mentioned information are important for planning and policy formulation as well as for promoting the establishment of Commercial farms, and to design and formulate means and ways as how to facilitate the transformation of the existing small and fragmented private peasant agricultural holding to Commercial farms in the long run.

CHAPTER II

SURVEY METHODOLOGY, OPERATION AND DATA PROCESSING

1. Survey Methodology

2.1 Scope & Coverage

The 2014/15 large and medium scale commercial farms cover all urban & rural parts of the country. Considering the cost and manageability of field work a sample of ***3255*** farms were planned and decided to be covered at national level. But the survey succeeded to cover 3041 farms. This sample is allocated to each region based on number of farms each region has. The regional level distribution of the Farms is given in Table 1.

2.2 Sampling frame

The sampling frame which is list of commercial farms with their cropland area size and livestock number is collected from all part of the country through CSA Branch Statistical Offices. The collected farm list is compiled at the head office and the functional and non functional farms at the time of updating are identified. Farms which are selected directly and those selected by sample are identified based on this frame. Then the lists of commercial farms to be covered by the survey are distributed back to the Branch Offices for the actual survey.

2.3 Sample design

Two separate sample design is prepared for Commercial farms involved in crop production and livestock. Before the sample selection was done, the cut off point for the farms was decided. The same cut off point for farms involved in crop production and those involved in livestock was set. Farms having total area/number of livestock above the cutoff point are selected with certainty where as farms having area/ number of livestock below the cutoff point is sampled using probability proportional to size, size being the total area / number of livestock of the farms. For farms involved in livestock simple random sampling technique is used for selection.

The estimation procedure and measure of their precision are given in Appendix I

Table 1: Number of planed and covered farms

Region	Number of	
	Planned	Covered
Tigray	**845**	**844**
Afar	**101**	**101**
Amhara	**885**	**835**

Oromya	**628**	**538**
Somali	**36**	**38**
Benishangul-Gumuz	**214**	**198**
SNNPR	**348**	**307**
Gambella	**111**	**97**
Harari	**11**	**10**
Addis Ababa	**50**	**50**
Dire Dawa	**26**	**23**
Total	**3255**	**3041**

3. Organization of Field Work

Field organization is usually used as a means to link the data source with the central office to properly carry on the field data collection operations and for the strict control and supervision of the fieldwork.

Since the Commercial farms sample survey is part and parcel of the 2014/15 (2007 E.C) annual Agricultural Sample Survey, the field organization setup that has been used for the agricultural sample survey of private agricultural holdings was also used for the enumeration of Commercial farms. Moreover, as it has been planned earlier, the actual field data compilation operation for commercial farms was scheduled to be started at the time the field data collection operation that have been carried out for private agricultural holdings were almost due completion. The field worker who was assigned for Commercial farm enumeration was responsible to cover a minimum of 1 and a maximum of 5 farms depending on the number of sampled farms within the territory of the Branch Statistical Office the enumerator belongs to. Moreover, senior supervisors and statisticians who accomplish their assignment in the private peasant agricultural holdings enumeration were assigned as supervisors for quality control that includes spot check, re- interview, and check the consistence of information in the filled-in questionnaires…etc.

3.1 Tr

ain ing

Country experience indicates that it is essential to provide instruction manual and training for survey enumerators and supervisors in order to standardize procedures, secure common understanding of tasks to be performed and provide a reference guide during enumeration. Good data quality is assured when the training meets its objectives and the enumerators and supervisors show a sense of responsibilities and enthusiasm in the exercise of the survey operations.

However, due to their scattered location, and a number of technical and administrative reasons, the field data collection activities for commercial farms was planned to be carried out by senior supervisors. Accordingly, CSA organized a two stage training program that is a training of trainers and followed by training of supervisors. The first stage training was given at the CSA headquarter in Addis Ababa to the trainers consisting of professional staff from different departments at head office. The second stage training was wider in its scope, focusing on reviewing the details of the prepared survey documents and followed by discussions on the past survey experience that took place in 25 training centers located at CSA Branch Offices .

3.2 Method of enumeration

Commercial farms are expected to properly register and document each and every activity carried out in each and every plot of land mainly for administrative purpose. In line with this, the data collection of the year 2014/15(2007 E.C) Commercial farms sample survey was performed by interviewing the farm Owners/managers. The areas of these farms are directly measured by GPS except that of state owned farms whose areas are collected by interview.

4. Data processing

4.1 Editing, Coding and Verification

In the 2014/2015(2007 E.C) Commercial farms sample survey; the filled-in forms retrieved from the Branch Statistical Offices were primarily received and systematically registered at the documentation unit of the CSA head quarters in Addis Ababa. Before launching the actual editing and coding activities, the Agriculture, Natural Resources, and Environment Statistics Directorate staff gave adequate training to 15 editors and coders who latter on carried out the manual editing, coding and verification of the filled-in Commercial farms questionnaires. The manual editing and coding activities of the filled-in forms were done region by region. To ensure the quality of the manual editing and coding work, verification of the completed questionnaires was carried out on 100% basis. For the total country, the editing, coding and verification of the filled-in forms for the commercial farms took 15 editors and about 14 working days.

4.2 Data Entry, Cleaning and Tabulation

About 15 data encoders were assigned to undertake the data entry activity of the 2014/15 filled- in and edited questionnaires of the large and medium scale farms. Before starting the actual data entry operation, data encoders were trained for about a half day using computer programs developed by the Data Processing Department staff. The Programmers prepared the data entry programs using CSPro.

The data entry exercise was carried out using 38 personal computers (PC's), and it was done region by region as in the case of the manual editing, coding and verification. In order to check the quality of the entered data, verification exercises were carried out. To this end verification activity, on 100% basis was carried out through the process of re-entering the data. For the total country, the whole data entry process of the filled-in forms on commercial farms took 38 entry clerks around 14 working days.

Data entered into the computer needs to be checked for completeness, consistency and validity. For this purpose, computer edit programs were prepared. Using printouts from these programs and referring to the original filled-in forms, corrections were made by trained manual data cleaning technicians. Moreover, other data-cleaning computer operators were involved in making the actual corrections of the data on

the computer. Additionally, an intermediate set of instructions or programs were made available and applied on the data to prepare information suitable for tabulation. These programs were prepared using CSPro and IMPS software's. Like IMPS Software, CSPro is used as a tool for entering, editing and tabulating data. Data made ready for tabulation through the process of cleaning and intermediate programs was finally used to generate the required tables. This was done using tabulation programs developed by the senior programmers of the Data Processing Department.

5. Concepts and Definitions

Information on all items of agriculture is not useful until the items are distinctly defined and understood. The procedure of stating data items and related terms is a prerequisite for making standards and definitions for collection and compilation of agricultural data. The intent of using standard concepts and definitions is not only to provide quality data but also to ensure that the right items are enumerated and compiled accurately to reflect the agricultural situation. Standard concepts and definitions used in a survey setup provide clear linkages between various tables of the current and previous surveys and maintain consistent enumeration and measurement of variables of interest. To this end, the CSA has put a lot of efforts into communicating concepts and definitions to the survey field staff through training and instruction manuals.

The concepts and definitions used in the census were made to conform to the FAO standard with a slight adaptation of a few of them to suit the agricultural situation in Ethiopia. The concepts and definitions used in commercial farms sample survey includes:-

Commercial Farms:- refers to certified (legally established) farms owned/operated by government, private investors, and/or share holders, which are profit oriented large and medium scale farms. These farms relatively use capital intensive, mechanized and market oriented farming system, as well as modern farm management practices and inputs such as irrigation scheme, fertilizers, pesticides . . . etc, to attain high productivity per unit of area.

Agriculture:- The growing of crops and/or raising of livestock for own consumption and/or sale.

Crop:- Includes Cereals, Pulses, Oilseeds, Vegetables, Root Crops, Fruits, Coffee, Inset, Chat, Hops, Sugar cane, Cotton, Tobacco … etc produced for food, making drinks, stimulation and making fabrics or clothing.

Crop Production:- The processes of growing and harvesting of the above crops for own consumption and/or sale.

Temporary Crops/Annual:- Annual temporary 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. Continuously grown crops planted in rotation are also considered as temporary crops since each is harvested and destroyed by plugging in preparation for each successive crop.

Permanent Crops:- crops which are grown and occupy land for a long period of time, not requiring replanting for several years after each harvest, are considered as permanent crops. All fruit trees (i.e. Oranges, Mandarin, Banana ...etc) and trees for beverages (i.e. Coffee, Tea, Hops…etc.) are considered permanent crops but meadows and pastures are excluded.

Meher (main) Season Crop:- any crop harvested between Meskerem (September) and Yekatit (February) is considered as Meher season crop.

Belg Season Crop:- any crop harvested during the months of March (Megabit) and August (Nehase) is considered to be Belg season crops.

Improved Seed:- is defined as crop variety which gives significantly higher yield, better quality and/or better benefit compared to traditional varieties of seeds and usually produced by the Ethiopian Seed Enterprise (ESE) in Ethiopia.

Fertilizer:- Refers to organic and/or inorganic nutrients to the soil intended to increase the amount of plant nutrients available for crop growth. Usually, fertilizers are divided into two parts, natural and industrial. Examples of natural fertilizers are farmyard manure, wood ashes, etc, while industrial fertilizers are DAP (Di-Ammonium phosphate), UREA (Ammonium Nitrate), etc.

Pesticides: - Pesticides are chemicals useful for mitigation, control or elimination of pests which are troublesome or harmful to crops. Insecticides, herbicides and fungicides are all considered as pesticides.

CHAPTER III

SUMMARY OF THE 2014/15 (2007 E.C) LARGE AND MEDIUM SCALE COMMERCIAL FARMS SAMPLE SURVEY RESULTS

3.1 Introduction

The type of crops on which data were collected during the 2014/15 (2007 E.C.) commercial farms sample survey are those food crops that are used for domestic consumption and for export as well as those crops used as raw material for domestic agro-industries. Based on their biological classifications these crops are categorized into three major groups i.e. grains (which include cereals, pulses and oil crops), vegetables and root crops from the category of temporary crops and three major groups i.e. Fruit crops, Cash crops and industrial crops from the category of permanent crops. In this chapter of the report, discussions on major findings of the survey results on cropped area and production of temporary and permanent crops of Meher Season crops presented in Section 3.2. Likewise, major findings on Farm Management Practices for Temporary and Permanent crops for Meher Season is presented in section 3.5, as obtained and summarized from the results of the 2014/15 (2007 E.C.) Large and Medium Scale Commercial Farms Sample Survey.

3.2 Meher Season' Total Cropland Area and Production of Temporary Crops

a) **Grain Crops**

Grain crops refer to the major crop categories that included cereals**,** pulses and oilseeds, which constituted the major food crops for the majority of the country's population. Besides being staple food crops, the production of grain crops in Ethiopia serves as a source of foreign currency earning that will be used as an input for all

efforts being made to bring about sustainable economic growth in the country. In Ethiopia, therefore, the production of grain crops is the most widely spread crop production activity both in terms of the extent of cropped land area and volume of production when compared with crops such as vegetable and root crops.

Summary Table 1. Estimates of Total Cropland Area by Major Crop Category of Meher Season for Commercial Farms: Country Level, 2014/15 (2007 E.C.)

Crop Type	**Area in hectare**	**Percentage**
Grain crops	612,081.21	97.2
Vegetables	6.791.23	1.1
Root crops	1,211.27	0.2
Other Temporary crops	15,685	2.5
All temporary crops	**628,977.48**	**100**

According to the results of the 2014/15(2007 E.C) Large and Medium Scale Commercial Farms

sample survey, the total area covered by grain crops was found to be *612,081.21* hectares

(*97.2***%** of the total country level temporary crops covered land area), from which a total of

12,151,038.91 quintals of production, **(***86.07* **%** of the total country level production of temporary crops) was obtained during 2014/15(2007 EC) Meher season harvest. The results of this survey indicates that, both the cultivated land area and volume of production of grain crops obtained from crop production activity carried out during the 2014/15 Meher Season, contributed
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Fig 1. Percentage distribution of total crop land area by major crop category for meher season for commercial farms at country level 2014/15 (2007 E.C)

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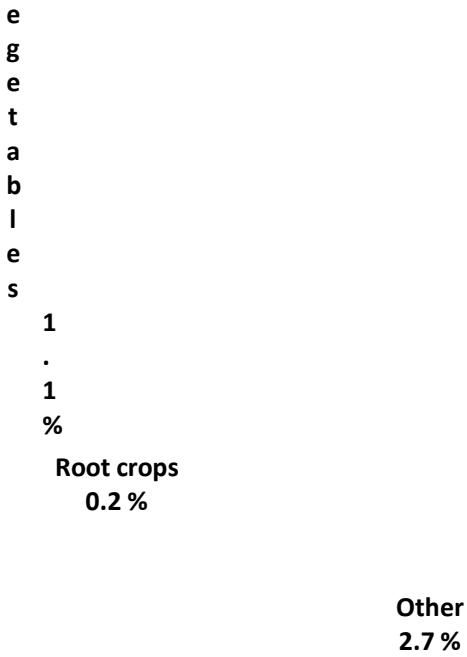
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%
Root crops
0.2 %
Other
2.7 %

Summary Table 2. Estimates of Total Production Harvested by Major Crop Category and Meher Season for Commercial Farms: Country Level, 2014/15 (2007 E.C.)

Types of crops	Production in quintals	percent
Grain crops	12,151,038.91	86.07
Vegetables	884,849.36	6.27
Root crops	301,180.72	2.13
Other Temporary crops	780,296.33	5.53
All temporary crops	**14,117,365.32**	**100**

Fig 2. Percentage Distribution Of Total Production By Major Crop Category For Meher Season For Commercial Farms At Country Level 2014/15 (2007 E.C)

Vegetables
6.27%

Root crops
2.13%

Other Temporary crops 5.53%

Grain crops 86.07%

Moreover, as it has been mentioned earlier, cereals which are classified within the grain crops category, are also produced in greater volume compared to the other crops by commercial farms because they are the principal staple crops and export commodities. As a matter of fact, cereals are grown in almost all the survey covered commercial farms with notable variation in the extent of area planted and the volume of production obtained across farms. This variation is seemingly caused by a shift in choice of crops, difference in weather conditions and speculated market demand. As indicated in the Appendix Table 2, cereals covered a total of **278,786.89** hectares of land area, from which a production of **8,992,766.04** quintals was obtained during 2014/15 Meher Season harvest. Similarly, pulses and oilseeds within the grain crops category are rich in dietary requirement

their nutrient content and being used as essential part of the for Most Ethiopians. Above all pulses and oil crops form a

significant commodity group of export that brings a considerable amount of foreign currency earnings for the country For the reasons mentioned above and a number of others, pulses and oil crops are grown widely by commercial farms in Ethiopia. Nevertheless, the extent of crop land area and volume of pulses and oil crops production in commercial farms show variation from one farm to another for the same reasons mentioned for cereals above. According to the results of the 2014/15 commercial farms sample survey, pulses and oil crops covered a total land area of **46,072.86** and **287,221.46** Hectares, from which a total production of **826,522.62** and **2,331,750.25** Quintals was obtained during the 2014/15 Maher seasons harvest, respectively (For details see Table 2 in Appendix).

b, Vegetables

Vegetables are crops that are rich in vitamins necessary for the healthy growth of humans. Moreover, due to their high nutritional value vegetables do have ever rising demand both in local and foreign markets, and are classified among those export commodities' that generate considerable amount of foreign currency earnings to the country. As a matter of these facts commercial farms in Ethiopia used to grow vegetables over a considerable land area for years.

As indicated in Appendix Table 2, vegetables covered a total of **6,791.23** hectares of land from which a total volume of **884,849.36** Quintals were obtained in 2014/15 by Meher Season's harvest.

c, Root Crops

Production of **301,180.72** quintals was obtained from Meher season's harvest (Tables 1 in Appendix). Like that of grain crops the contribution of root crops such as potatoes and sweet potatoes for human consumption as food crops cannot be over emphasized. The majority of the population in Southern and South Western Ethiopia mainly depends on root crops for their daily food consumption. In addition to serving as food crop and staple food at the time of surplus and/or deficit production years, root

crops yield industrial and pharmaceutical products. Moreover, it should be noted that root crops are also a good source of cash and foreign exchange. As the survey result indicates, the total area under root crops was found to be **1,211.27** hectares, from which a total Production of **301,180.72** quintals was obtained.

3.3 Cropland Area and Production of Permanent Crops

Permanent crops are long-term crops, which do not have to be replanted for several years after each harvest. These include tree crops such as coffee, enset, chat, oranges, mangoes, bananas, papayas, avocados…etc. It doesn't include cotton. The trees that yield oranges; mangoes,

papayas, apples and other are known as fruit trees. Permanent crops are a good source of cash both for the farms and the country for generating income and foreign exchange.

According to the survey result permanent crops covered a total land of **347,767.63** Hectares with a total production **67,817,439.92** of Quintals obtained from commercial farms during the year
2014/15 Meher season harvest. These area and production for permanent crops does not include
the values of cotton. For simplicity of description of the statistical tables and comparison purposes permanent crops have been grouped into three categories. The categories are fruit crops, cash/stimulant crops, industrial and other permanent crops.

Summary Table 3. Estimates of total area harvested of Meher Season's permanent crops by major crop category for commercial farms:
National Level 2014/15
(2007 E.C)

Crop Type	Area in hectare	Percent
Fruit crops	7700.69	*2.21689*
Cash crops	112393.71	*32.35613*
Industrial crops	223270.60	*64.27559*
Other Permanent crops	3999.54	*1.151396*

All permanent crops	**347364.54**	*100*

A
Fruit
Crop
s

Fruit production is relatively new to Ethiopian agricultural system, with commercial fruit production dating back to only about six decades. Therefore, most of the important fruits that are produced in commercial farms are recent introductions into the country. However, various kinds of fruit crops grow in different regions of the country yielding varying quantities of fruits within commercial farms. Summary of total area harvested of Meher Season's permanent crops by major crop category for commercial farms is illustrated in Summary Table 3 and in Fig 3.

As indicated in Summary Table 3, fruit crops covered a total area of ***7700.69*** Hectares (**2.21%** of the total crop land area under permanent crops), with about ***1035819.28*** quintals of production (**1.6%** of the total permanent crops production), during the 2014/15 Meher Season harvest.

Oranges, Mangoes and Bananas took the highest area and production share of fruit crops (See

Table 1 in Appendix).

Fig 3. Percentage Distribution Area Under Permanent And Industrial Crops For Meher

Season For Commercial Farms At Country Level 2014/15)

Other Permanen t crops
1.15%

Industrial crops
64.2%

Fruit crops
2.21%

Cash crops
32.31%

B
Cash/Stimulant crops

Cash/stimulant crops include crops such as tea, coffee and chat considered as easily marketable at local and foreign markets. Commercial farms engaged in growing stimulant crops such as coffee and tea uses larger area with the objective of obtaining larger volume of production so as to earn considerable amount of cash in local and/or foreign currency. As indicated in Table 3 cash/stimulant crops were grown on an estimated total land area of ***112393.71*** hectares, with a total production estimated at ***1308956.23*** quintals of production, contributing about **32.3%** and **1.9 %** to the total cropland area and production of permanent crops, respectively (For details see

Summary
Table 3).

C
Industrial Crops

Industrial crops refer to crops commonly used as raw material for domestic agro-industries, which include crops such as **cotton** and **sugarcane**. Industrial crops grown in commercial farms covered a total land area of ***223270.60*** hectares (**64.2%** of the total area under permanent crops), with a total production of ***65147700.84*** Quintals (**96.10 %** of the total permanent crops production), during the 2014/15 Meher Season harvest.

Summary Table 4. Estimates of total production harvested of Meher Season's permanent crops by major crop category for commercial farms:*National Level 2014/15 (2007 E.C)*

Crop s Type	**Production in Quintals**	**Percent**
Fruit crops	1035819.28	*1.527667*
Cash crops	1308956.23	*1.9305*
Industrial crops	65147700.84	*96.08241*
Other Permanent crops	311508.17	*0.459425*
All permanent Crops	*67803984.52*	*100*

Fig 4. Percentage Distribution

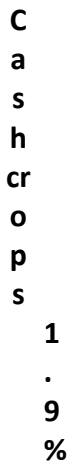
Production Under Permanent And Industrial Crops For Meher Season For Commercial Farms At Country Level 2014/15 (2007 E.C)

Industrial crops

Other Permanent

96.01%

crops
0.5%



3.4 Comparison of the current year (2014/15) Grain Crops yield with last Year (2012/13), estimates.

Table A of the report attempts to compare area covered and total production estimates of selected important food crops obtained from the 2014/15 (2007 E.C.) commercial farms Survey with last year i.e. 2013/14(2006 E.C.) Area and crop production estimates of the same crops.

Both the estimated cropped land area and the volume of grain crops production obtained have increased by about **1.62%** and **1.94 %** over last year 2013/14 estimate.

3.5 Farm Management Practice

3.5.1 Introduction

The overall performance of a country's agriculture, usually affected by quite a number of factors, among which the level and extent of using modern agricultural practices (such as increased use of fertilizer, pesticides, and improved seeds…etc) is the first and the most important factor to be considered. This is merely because increased productivity can only be achieved through the use of the above mentioned farm inputs along with appropriate newly introduced modern farm management practices.

Towards this end, a number of modern techniques and technologies are available to help achieve enhanced crop productivity. The major actors behind achieving high level of productivity include among others, greater and efficient use of fertilizers, pesticides and improved seeds. Thus, during the year 2014/15 (2007 E.C) commercial farms sample survey, basic data on the agricultural inputs and practices were collected, summarized and the result are presented in this report.

3.5.2 Cropland Area under Different Agricultural Input and Farm Management Practices

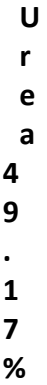
This section of the chapter deals with the agricultural input applied cropland area and quantity of inputs used by commercial farms.

a. Fertilized Cropland Areas and Quantity Applied

Fertilizing materials and mixture are not restricted to in organic chemical but include organic substances such as crop residues, animal dung …etc. Therefore, fertilizers refer to organic and/or inorganic materials added to the soil with the intention of increasing the amount of plant nutrients available for crop growth. However, in 2014/15 (2007E.C) commercial farms sample survey; data was collected only on the application of chemical fertilizers. The chemical fertilizers that were covered by the survey consisted of DAP (DI-Ammonium phosphate, and UREA (Ammonium nitrate). The results of the survey indicates that at country level the total Urea and DAP applied cropland area was found to be **402,074.27** and **415,565.92** hectares, which accounted for **49.17%** and **50.83%** of the total cropland area reported for Commercial farms at country level, during the 2014/15 Meher Season harvest. (For details see Table 3 on Appendix)

Fig 5. Percentage Distribution Of Chemical Fertilizers Applied Cropland Area By Type Of

Fertilizer For Meher Season For Commercial Farms At Country Level 2014/15 (2007 E.C)



b.Quantity of Chemical Fertilizer Applied

According to the results of the survey, the total quantity of chemical fertilizers applied during

2014/15 Meher Season for commercial farms was found to be **881,498.08** quintals. Out

of which
the share of DAP was **52.9**

% while the remaining **47.1 %** share was

found to be the
contribution of UREA. (For details see Table 3 on appendix and Figure 6).

Fig 6. Percentage Distribution Of Total Amount Of Chemical Fertilizers Applied By Type

Of Fertilizer For Meher Season For Commercial Farms At Country Level 2014/15

C . Cropland Areas Treated with Chemicals.

Pesticides, fungicide and herbicides are chemicals that are commonly used for the control of mitigation of elimination of pests that are detrimental to crops growth and productivity

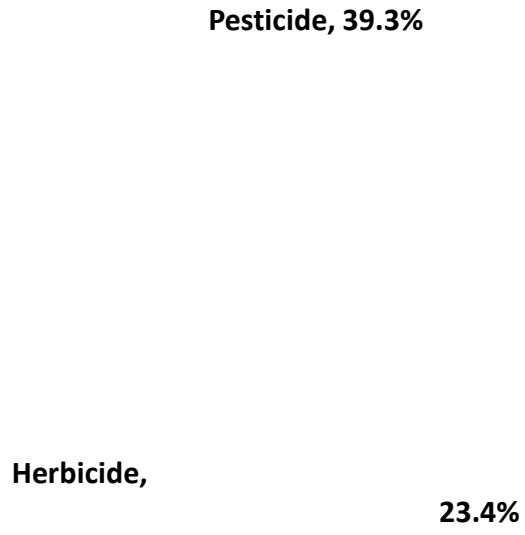
As indicated in statistical For details see Table 3 on appendix, the total cropland area treated with

pesticides, fungicides and herbicides in commercial farms was found to be

189,170.30
Hectares, **179,549.13** Hectares

and **398,888.92** hectares of cropland area, respectively. (For details see Table 3 on appendix and Figure 7).

Fig 7. Percentage Distribution Of Chemicals Treated Cropland Area By Type Of Chemicals Used For Meher Season For Commercial Farms At Country Level 2014/15 (2007 E.C)



Fungicide,
37.3%

d. <u>Quantity of Chemicals used</u>

The total quantity of chemicals

used during 2014/15 for commercial farms

was found to be

372,264.52 Quintals during Meher Season, out of which the share of pesticides and herbicides was 24.7% **and 45.2% respectively**. While the remaining**29.01 %,** share was found to be the
contribution of fungicides (For details see Table 3 on appendix and Figure 8).

8.Percentage Distribution Of Total Amount Of Chemicals Applied By Type Of Chemicals Applied

For Meher Seasons For Commercial Farms At Country Level 2014/2015(2007 E.C)

Pesticides 24.7%

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Appendix I

Estimation Procedures of Tables, Ratios and sampling Error

Large and medium Scale Commercial

Farms

2014/15
(2007EC)

Table 1 Estimate of Cropland Area and Production of Commercial Farms, 2007E.C. (2014/15) National Crop

Hectares	%	Quintals	%	QT/HA		
Grains		612,081.21	62.12	12,151,038.91	14.83	
Teff		6,556.33	0.67	96,082.56	0.12	14.65
Barley		2,260.57	0.23	65,349.37	0.08	28.91
Maize		86,909.77	8.82	3,554,695.25	4.34	40.90
Finger millet		444.89	0.05	7,398.42	0.01	16.63
Rice		3,438.11	0.35	85,542.78	0.10	24.88
Horse/Faba beans		791.18	0.08	15,559.88	0.02	19.67
Haricot beans		10,001.86	1.02	185,760.42	0.23	18.57
Lentiles		46.96	-	778.88	-	16.59
Vetch/Grass peas		38.70	-	695.16	-	17.96
Fenugreek		514.99	0.05	6,930.10	0.01	13.46
Gibto		5.90	-	66.18	-	11.22
Nueg		999.27	0.10	9,095.22	0.01	9.10
Ground nuts		1,773.78	0.18	31,762.71	0.04	17.91
Sesame		280,422.04	28.46	2,222,536.55	2.71	7.93
Rapeseed		3,449.87	0.35	59,069.50	0.07	17.12
Lettuce		201.55	0.02	58,536.83	0.07	290.43
Ethiopian Cabbage		17.94	-	1,756.02	-	97.88
Green peppers		150.37	0.02	29,646.07	0.04	197.15
Swiss chard		41.93	-	1,332.65	-	31.78
Beet root		3.16	-	321.37	-	101.70
Onion		866.31	0.09	193,067.05	0.24	222.86
Potatoes		180.52	0.02	37,468.43	0.05	207.56
Taro/'Godere'/		2.62	-	720.86	-	275.14
Other Temporary		15,685.72	1.77	780,296.33	0.95	
Fruit crops		7,700.69	0.78	1,035,819.28	1.27	
Bananas		1,910.97	0.19	179,245.89	0.22	93.80
Lemons		48.25	-	3,650.17	0.01	75.65
Oranges		2,454.24	0.25	327,622.94	0.40	133.49
Papayas		716.25	0.07	322,235.95	0.39	449.89
Cash crpops		336,067.40	34.11	66,470,112.47	81.12	
Coffee		108,007.40	10.96	799,714.81	0.98	7.40

Hopes/'Gesho'/	1.89	-	45.64	-	24.15
Sugar cane	51,088.70	5.19	61,778,945.52	75.40	1,209.25
Other permanent crops	3,999.54	0.41	311,508.17	0.38	77.89

Tigray

Afar

Amhara

Oromia

Somale

Benshangul-Gumuz

(S.N.N.P.R)

Gambela

Dire Dawa

Table 4 Estimate of farm input applied cropland area and quantity of input used by crop and inpute used in commercial farm 2007 E.C, (2014/2015)

National	Chemical Fertilizer Applied							
	UREA		DAP		Improved Seed		Indigenous Seed	
Type of crop	Area in Ha	Amnt in Qts	Area in Ha	Amnt in Qts	Area in Ha	Amnt in Qts	Area in Ha	Amnt in Qts
Total	402,074.27	414,697.85	415,565.92	466,800.23	145,804.62	163,535.28	313,490.06	320,216.20
Grains	381,579.73	407,476.82	393,427.81	444,490.13	135,637.97	163,425.33	296,125.56	313,921.10
Cereals	180,391.02	204,603.90	183,240.73	229,647.37	98,376.31	162,221.66	105,759.87	158,445.00
Teff	2,976.66	1,547.66	4,039.82	2,764.70	3,629.96	145.89	680.68	804.40
Barley	672.69	3,068.91	1,415.44	8,721.46	1,245.23	626.93	170.21	2,293.00
Wheat	63,326.36	70,614.99	62,973.88	92,211.54	46,351.30	108,054.32	24,103.33	133,469.10
Maize	71,589.34	105,481.43	73,238.90	93,924.29	43,643.25	53,171.21	38,889.13	6,856.30
Sorghum	40,361.98	22,233.04	40,753.89	30,715.38	2,585.47	31.54	40,971.00	13,983.70
Finger millet	59.61	2.10	109.48	18.00	7.06	0.84	102.42	15.30
Oats/'Aja'/	-	-	-	-	-	-	-	-
Rice	1,404.37	1,655.77	709.32	1,292.00	914.04	190.93	843.11	1,023.20
Pulse	4,452.97	25,203.47	8,830.40	13,293.58	11,788.08	964.43	9,322.91	30,658.40
Horse/Faba beans	0.05	0.11	226.27	702.58	0.05	0.06	226.22	11,292.50
Field peas	190.70	81.90	119.48	38.00	130.23	2.09	75.29	38.80
Haricot beans	2,324.49	2,716.35	4,055.82	3,445.00	3,123.01	90.53	1,554.34	395.80
Chick peas	43.58	0.63	1,113.98	334.00	837.53	32.01	2,996.05	4,695.20
Lentiles	3.94	1.05	3.94	1.00	3.94	0.08	-	-
Vetch/Grass peas	-	-	-	-	-	-	-	-
Soya beans	1,369.17	22,385.58	2,788.11	8,701.50	7,687.46	839.36	3,954.07	14,001.60
Fenugreek	514.99	-	514.99	-	-	-	514.99	9.70
Mung beans/"Masho"/	6.06	17.85	7.82	71.50	5.87	0.30	1.95	224.80
Gibto	196,735.74	177,669.45	201,356.68	201,549.18	25,473.58	239.24	181,042.78	124,817.70
Oile seeds	-	-	-	-	-	-	-	-
Nueg	10.76	-	178.24	4.00	-	-	178.24	21.20

Linseed	89.63	21.00	351.36	166.00	89.63	3.50	261.73	2.80
Ground nuts	95.84	4.20	370.03	23.00	24.74	1.08	441.12	136.80
Safflower	1.84	-	4.46	-	2.62	0.01	1.84	0.90
Sesame	196,240.32	177,570.75	197,695.47	196,536.88	25,111.26	227.39	177,648.05	123,784.50
Rapeseed	297.36	73.50	2,757.12	4,819.30	245.33	7.26	2,511.80	871.50
Vegetables	3,639.51	5,143.80	3,830.26	4,000.48	3,058.82	13.55	1,577.15	3,642.10
Lettuce	195.26	-	172.56	-	195.26	0.04	-	-
Head Cabbage	125.15	53.59	118.59	46.08	138.42	0.08	2.24	0.20
Ethiopian Cabbage	-	-	-	-	-	-	-	-
Tomatoes	1,230.79	1,782.17	1,308.17	1,032.16	1,335.27	0.64	22.91	1.80
Green peppers	143.06	234.68	141.22	209.00	145.74	0.17	8.11	24.50
Red papers	1,912.72	3,073.36	2,057.20	2,713.24	1,211.61	11.22	1,543.89	3,615.60
Swiss chard	32.52	-	32.52	-	32.52	1.40	-	-
Root crops	904.98	2,277.14	767.04	1,601.50	749.46	66.63	253.09	1,090.10
Beet root	-	-	2.85	7.00	1.34	-	-	-
Carrot	2.72	-	1.57	-	2.72	-	-	-
Onion	674.45	2,059.05	581.07	1,440.50	575.81	9.85	192.29	177.70
Potatoes	150.89	142.49	129.56	110.00	91.61	41.10	60.80	912.40
Garlic	-	-	-	-	-	-	-	-
Taro/'Godere'/	-	-	-	-	-	-	-	-
Sweet potatoes	76.92	75.60	51.99	44.00	77.98	15.68	-	-
Other Temporary	20,087.74	7,071.93	19,296.48	17,446.80	9,810.82	85.61	14,852.70	5,423.60
Permanent crops	-	-	-	-	-	-	-	-
Fruit crops	4,253.25	5,716.79	4,241.85	5,100.76	0.41	-	-	-
Avocado	0.71	-	0.71	-	-	-	-	-
Bananas	194.97	352.80	193.96	151.00	0.41	-	-	-
Guava/'Zeytun'/	28.83	8.74	28.83	8.12	-	-	-	-
Lemons	7.94	2.25	7.87	2.00	-	-	-	-
Mangos	1,750.00	1,617.01	1,741.19	1,545.44	-	-	-	-
Oranges	1,650.45	2,662.17	1,650.45	2,792.20	-	-	-	-
Papayas	609.86	1,052.82	608.36	595.00	-	-	-	-
Pineapples	10.50	21.00	10.50	7.00	-	-	-	-
Cash crpops	478,268.15	68,460.09	487,734.69	127,956.86	411,534.01	85.61	16,332.64	5,423.60
Chat	-	-	-	-	-	-	-	-
Coffee	13,759.02	25,262.19	27,301.59	18,108.82	27.24	-	8.49	-
Tea	3,408.44	5,238.98	3,408.44	1,651.24	-	-	1,470.60	-
Hopes/'Gesho'/	-	-	-	-	-	-	-	-
Enset	-	-	-	-	-	-	-	-
Sugar cane	441,023.45	30,907.99	437,738.68	90,757.00	401,695.95	-	0.85	-
Cotton	20,077.24	7,050.93	19,285.98	17,439.80	9,810.82	85.61	14,852.70	5,423.60
Other permanent crops	1,294.01	2,512.53	1,368.04	3,588.26	1,343.22	339.46	565.37	1,749.00

Table 4 Estimate of farm input applied cropland area and quantity of input used by crop and input types for commercial frams, 2007 E.C. (2014/15)

Tigray	IN HECTARES	Chemical Fertilizer Applied					
Type of crop	UREA		DAP		Improved Seed		Indigenous Seed	
	Area in Ha	Amnt in Qts	Area in Ha	Amnt in Qts	Area in Ha	Amnt in Qts	Area in Ha	Amnt in Qts
Total	137,384.19	172,711.72	139,317.05	194,360.89	16,774.45	132.45	123,113.07	104,708.50
Grains	133,161.28	168,606.05	135,094.14	186,664.59	15,312.02	128.04	120,351.52	103,913.10
Cereals	25,240.79	20,953.16	25,855.08	29,632.68	1,853.31	38.86	24,121.06	7,682.10
Teff	14.32	36.75	17.51	49.00	17.00	2.66	0.51	0.40
Barley	-	2,524.90	-	4,268.30	-	-	-	-
Wheat	41.18	42.53	41.18	52.50	17.58	10.71	23.60	147.60
Maize	113.37	431.55	113.37	412.00	112.84	10.25	1.06	4.90
Sorghum	25,071.92	17,915.33	25,683.02	24,848.88	1,705.90	15.24	24,095.89	7,529.20
Finger millet	-	2.10	-	2.00	-	-	-	-
Oats/'Aja'/	-	-	-	-	-	-	-	-
Rice	-	-	-	-	-	-	-	-
Pulse	-	-	5.19	6.00	-	-	5.19	4.90
Horse/Faba beans	-	-	-	-	-	-	-	-
Field peas	-	-	-	-	-	-	-	-
Haricot beans	-	-	-	-	-	-	-	-
Chick peas	-	-	5.19	6.00	-	-	5.19	4.90
Lentiles	-	-	-	-	-	-	-	-
Vetch/Grass peas	-	-	-	-	-	-	-	-

Soya beans	-	-	-	-	-	-	-	-
Fenugreek	-	-	-	-	-	-	-	-
Mung beans/"Masho"/	-	-	-	-	-	-	-	-
Gibto	107,920.49	147,652.89	109,233.87	157,025.91	13,458.71	89.18	96,225.27	96,226.10
Oile seeds	-	-	-	-	-	-	-	-
Nueg	-	-	-	-	-	-	-	-
Linseed	-	-	-	-	-	-	-	-
Ground nuts	-	-	-	-	-	-	-	-
Safflower	-	-	-	-	-	-	-	-
Sesame	107,920.49	147,652.89	109,233.87	157,025.91	13,458.71	89.18	96,225.27	96,226.10
Rapeseed	-	-	-	-	-	-	-	-
Vegetables	666.74	214.41	696.55	218.20	768.40	0.22	1.26	-
Lettuce	0.47	-	0.47	-	0.47	-	-	-
Head Cabbage	4.19	5.25	4.19	8.00	2.93	0.02	1.26	-
Ethiopian Cabbage	-	-	-	-	-	-	-	-
Tomatoes	179.52	68.46	280.79	89.20	280.79	-	-	-
Green peppers	52.86	14.70	52.86	25.00	54.52	0.07	-	-
Red papers	429.69	126.00	358.23	96.00	429.69	0.13	-	-
Swiss chard	-	-	-	-	-	-	-	-
Root crops	175.05	95.55	163.59	118.50	137.51	6.22	60.49	26.70
Beet root	-	-	-	-	-	-	-	-
Carrot	1.57	-	1.57	-	1.57	-	-	-
Onion	131.71	93.45	120.24	112.50	132.75	6.22	20.85	7.30
Potatoes	39.65	-	39.65	-	-	-	39.65	19.40
Garlic	-	-	-	-	-	-	-	-
Taro/'Godere'/	-	-	-	-	-	-	-	-
Sweet potatoes	2.12	2.10	2.12	6.00	3.19	-	-	-
Other Temporary	4,220.79	4,103.57	4,220.79	7,690.30	1,459.24	4.41	2,761.55	795.40
Permanent crops	-	-	-	-	-	-	-	-
Fruit crops	187.81	35.70	187.81	37.00	-	-	-	-
Avocado	0.08	-	0.08	-	-	-	-	-
Bananas	0.28	-	0.28	-	-	-	-	-
Guava/'Zeytun'/	-	-	-	-	-	-	-	-
Lemons	7.87	2.10	7.87	2.00	-	-	-	-
Mangos	141.60	12.60	141.60	14.00	-	-	-	-
Oranges	35.40	9.45	35.40	9.00	-	-	-	-
Papayas	2.59	11.55	2.59	12.00	-	-	-	-
Pineapples	-	-	-	-	-	-	-	-
Cash crpops	4,220.79	4,103.57	4,220.79	7,690.30	1,459.24	4.41	2,761.55	795.40
Chat	-	-	-	-	-	-	-	-
Coffee	-	-	-	-	-	-	-	-
Tea	-	-	-	-	-	-	-	-
Hopes/'Gesho'/	-	-	-	-	-	-	-	-
Enset	-	-	-	-	-	-	-	-
Sugar cane	-	-	-	-	-	-	-	-
Cotton	4,220.79	4,103.57	4,220.79	7,690.30	1,459.24	4.41	2,761.55	795.40
Other permanent crops	5.90	129.15	5.90	138.00	5.90	0.01	-	-

Afar

Amhara

Oromia
Somale

Table 4 Estimate of farm input applied cropland area and quantity of input used by crop and input types for commercial frams, 2007 E.C. (2014/15)
Benshangul-Gumuz

	UREA		DAP		Improved Seed		Indigenous Seed	
Type of crop	Area in Ha	Amnt in Qts	Area in Ha	Amnt in Qts	Area in Ha	Amnt in Qts	Area in Ha	Amnt in Qts
Total	5,503.02	31,319.42	4,796.77	23,430.90	6,368.10	713.30	5,672.39	5,312.90
Grains	3,858.78	30,619.07	4,656.01	23,326.90	5,136.55	690.97	2,734.79	3,239.20
Cereals	2,488.75	23,999.65	2,237.42	22,801.40	3,539.57	643.46	918.68	841.50
Teff	-	-	-	-	-	-	-	-
Barley	-	-	-	-	-	-	-	-
Wheat	42.43	33.60	-	-	42.43	0.28	-	-
Maize	2,110.67	23,821.67	1,886.27	22,265.40	3,422.47	627.98	523.60	543.20

Sorghum	250.65	144.38	266.15	536.00	54.26	0.86	310.08	220.70
Finger millet	-	-	-	-	-	-	-	-
Oats/'Aja'/	-	-	-	-	-	-	-	-
Rice	85.00	-	85.00	-	20.40	14.34	85.00	77.60
Pulse	1,137.98	966.00	2,199.80	320.00	1,465.40	30.17	1,601.40	1,776.00
Horse/Faba beans	-	-	-	-	-	-	-	-
Field peas	-	-	-	-	-	-	-	-
Haricot beans	690.88	16.80	1,079.50	16.00	-	-	1,079.50	117.40
Chick peas	-	-	-	-	-	-	-	-
Lentiles	-	-	-	-	-	-	-	-
Vetch/Grass peas	-	-	-	-	-	-	-	-
Soya beans	447.10	949.20	1,120.30	304.00	1,465.40	30.17	521.90	1,658.60
Fenugreek	-	-	-	-	-	-	-	-
Mung beans/"Masho"/	-	-	-	-	-	-	-	-
Gibto	232.05	5,653.42	218.79	205.50	131.58	17.34	214.71	621.70
Oile seeds	-	-	-	-	-	-	-	-
Nueg	-	-	-	-	-	-	-	-
Linseed	-	-	-	-	-	-	-	-
Ground nuts	-	-	-	-	-	-	-	-
Safflower	-	-	-	-	-	-	-	-
Sesame	232.05	5,653.42	218.79	205.50	131.58	17.34	214.71	621.70
Rapeseed	-	-	-	-	-	-	-	-
Vegetables	85.54	53.55	82.77	44.00	-	-	191.90	17.90
Lettuce	-	-	-	-	-	-	-	-
Head Cabbage	-	-	-	-	-	-	-	-
Ethiopian Cabbage	-	-	-	-	-	-	-	-
Tomatoes	-	-	-	-	-	-	-	-
Green peppers	-	-	-	-	-	-	-	-
Red papers	85.54	53.55	82.77	44.00	-	-	191.90	17.90
Swiss chard	-	-	-	-	-	-	-	-
Root crops	-	-	-	-	-	-	-	-
Beet root	-	-	-	-	-	-	-	-
Carrot	-	-	-	-	-	-	-	-
Onion	-	-	-	-	-	-	-	-
Potatoes	-	-	-	-	-	-	-	-
Garlic	-	-	-	-	-	-	-	-
Taro/'Godere'/	-	-	-	-	-	-	-	-
Sweet potatoes	-	-	-	-	-	-	-	-
Other Temporary	1,644.24	700.35	140.76	104.00	1,231.55	22.33	2,937.60	2,073.70
Permanent crops	-	-	-	-	-	-	-	-
Fruit crops	-	-	-	-	-	-	-	-
Avocado	-	-	-	-	-	-	-	-
Bananas	-	-	-	-	-	-	-	-
Guava/'Zeytun'/	-	-	-	-	-	-	-	-
Lemons	-	-	-	-	-	-	-	-
Mangos	-	-	-	-	-	-	-	-
Oranges	-	-	-	-	-	-	-	-
Papayas	-	-	-	-	-	-	-	-
Pineapples	-	-	-	-	-	-	-	-
Cash crpops	1,645.09	700.35	140.76	104.00	1,231.55	22.33	2,938.45	2,073.70
Chat	-	-	-	-	-	-	-	-
Coffee	-	-	-	-	-	-	-	-
Tea	-	-	-	-	-	-	-	-
Hopes/'Gesho'/	-	-	-	-	-	-	-	-
Enset	-	-	-	-	-	-	-	-
Sugar cane	0.85	-	-	-	-	-	0.85	-
Cotton	1,644.24	700.35	140.76	104.00	1,231.55	22.33	2,937.60	2,073.70
Other permanent crops	-	-	-	-	-	-	-	-

Table 4 Estimate of farm input applied cropland area and quantity of input used by crop and input types for commercial frams, 2007 E.C. (2014/15) (S.N.N.P.R)

	UREA		DAP		Improved Seed		Indigenous Seed	
Type of crop	Area in Ha	Amnt in Qts	Area in Ha	Amnt in Qts	Area in Ha	Amnt in Qts	Area in Ha	Amnt in Qts
Total	23,668.07	18,992.53	30,237.67	20,922.94	29,798.05	51,950.84	1,675.64	1,685.40
Grains	21,751.79	18,565.18	28,554.21	20,451.94	28,023.68	51,914.84	1,438.68	1,677.30
Cereals	21,314.86	18,017.92	25,156.48	19,444.34	25,103.37	51,814.70	950.10	1,350.90

Teff	1,845.54	307.13	2,478.53	696.50	2,441.05	22.99	50.70	55.10
Barley	21.00	10.50	21.00	-	21.00	2.80	-	-
Wheat	910.50	737.10	2,138.59	2,421.18	2,121.56	231.27	12.70	58.20
Maize	17,871.80	16,242.89	19,910.60	15,773.66	20,003.09	51,503.55	721.73	816.30
Sorghum	57.87	67.20	73.48	89.00	7.81	0.08	65.68	102.30
Finger millet	-	-	-	-	-	-	-	-
Oats/'Aja'/	-	-	-	-	-	-	-	-
Rice	608.15	653.10	534.29	464.00	508.87	54.01	99.28	319.00
Pulse	312.40	382.41	3,021.67	745.60	2,724.72	96.13	296.95	310.10
Horse/Faba beans	-	-	-	-	-	-	-	-
Field peas	-	-	-	-	-	-	-	-
Haricot beans	246.90	153.30	1,881.28	504.00	1,881.28	63.79	-	-
Chick peas	33.91	-	1,108.79	4.00	837.53	32.01	271.26	306.60
Lentiles	3.94	1.05	3.94	1.00	3.94	0.08	-	-
Vetch/Grass peas	-	-	-	-	-	-	-	-
Soya beans	27.61	228.06	27.61	236.60	1.93	0.23	25.68	3.50
Fenugreek	-	-	-	-	-	-	-	-
Mung beans/"Masho"/	0.05	-	0.05	-	0.05	0.02	-	-
Gibto	124.53	164.85	376.06	262.00	195.59	4.01	191.63	16.30
Oile seeds	-	-	-	-	-	-	-	-
Nueg	-	-	167.48	4.00	-	-	167.48	1.80
Linseed	-	-	-	-	-	-	-	-
Ground nuts	-	-	-	-	-	-	-	-
Safflower	1.84	-	4.46	-	2.62	0.01	1.84	0.90
Sesame	122.69	164.85	204.12	258.00	192.96	4.00	22.31	13.60
Rapeseed	-	-	-	-	-	-	-	-
Vegetables	402.66	869.40	543.09	798.00	286.70	9.91	299.43	27.60
Lettuce	-	-	-	-	-	-	-	-
Head Cabbage	5.49	10.50	4.86	9.00	4.50	0.03	0.98	0.20
Ethiopian Cabbage	-	-	-	-	-	-	-	-
Tomatoes	18.86	480.90	18.26	457.00	16.24	0.20	2.77	1.60
Green peppers	5.28	159.60	5.22	150.00	5.12	0.07	0.43	24.30
Red papers	346.15	218.40	487.87	182.00	233.96	9.61	295.25	1.50
Swiss chard	26.87	-	26.87	-	26.87	-	-	-
Root crops	214.14	804.30	187.02	685.00	211.63	48.14	7.36	2.80
Beet root	-	-	-	-	-	-	-	-
Carrot	-	-	-	-	-	-	-	-
Onion	78.65	664.65	76.47	575.00	76.15	0.60	7.36	2.80
Potatoes	60.69	66.15	60.69	72.00	60.69	31.86	-	-
Garlic	-	-	-	-	-	-	-	-
Taro/'Godere'/	-	-	-	-	-	-	-	-
Sweet potatoes	74.80	73.50	49.86	38.00	74.80	15.68	-	-
Other Temporary	1,814.61	353.85	1,606.73	433.00	1,672.70	20.32	236.96	8.10
Permanent crops	-	-	-	-	-	-	-	-
Fruit crops	429.59	819.00	429.59	592.04	0.41	-	-	-
Avocado	-	-	-	-	-	-	-	-
Bananas	189.76	350.70	189.76	149.00	0.41	-	-	-
Guava/'Zeytun'/	-	-	-	-	-	-	-	-
Lemons	-	-	-	-	-	-	-	-
Mangos	224.19	225.96	224.19	324.64	-	-	-	-
Oranges	-	-	-	-	-	-	-	-
Papayas	5.14	221.34	5.14	111.40	-	-	-	-
Pineapples	10.50	21.00	10.50	7.00	-	-	-	-
Cash crpops	7,067.61	21,953.93	7,396.97	3,470.94	1,699.94	20.32	236.96	8.10
Chat	-	-	-	-	-	-	-	-
Coffee	3,323.51	20,811.00	3,862.90	2,784.50	27.24	-	-	-
Tea	1,937.84	810.08	1,937.84	260.44	-	-	-	-
Hopes/'Gesho'/	-	-	-	-	-	-	-	-
Enset	-	-	-	-	-	-	-	-
Sugar cane	2.15	-	-	-	-	-	-	-
Cotton	1,804.11	332.85	1,596.23	426.00	1,672.70	20.32	236.96	8.10
Other permanent crops	4.42	300.30	10.27	405.00	11.43	228.76	0.03	0.50

Table 4 Estimate of farm input applied cropland area and quantity of input used by crop and input types for commercial frams, 2007 E.C. (2014/15) Gambela

Table 4 Estimate of farm input applied cropland area and quantity of input used by crop and input types for commercial frams,

2007 E.C. (2014/15) Dire Dawa

TABLE 4 contd								
National								
Type of crop	Pesticides		Fungicides		Herbicides		Other	
	Area in Ha	Amnt in Qts		Area in Ha	Amnt in Qts		Area in Ha	Amnt in Qts
Total	189,170.30	91,994.18	179,549.13	111,678.69	398,888.92	168,591.65	35,235.49	24,278.10
Grains	121,917.20	14,051.88	174,821.26	111,254.49	382,951.03	166,335.65	24,971.52	24,113.10
Cereals	115,733.31	12,894.18	172,918.69	108,826.45	371,679.52	164,422.70	22,814.00	24,110.50
Teff	4,655.73	49.70	96.58	34.34	8,602.78	1,816.93	-	-
Barley	731.94	122.05	2,714.80	1,270.08	2,973.58	1,463.07	-	-
Wheat	14,147.36	982.83	142,991.28	106,662.42	169,780.05	80,720.65	22,810.94	24,110.00
Maize	90,959.58	10,027.75	24,554.82	822.90	79,168.79	39,181.68	3.05	0.50
Sorghum	3,056.65	626.85	2,466.30	36.71	108,378.21	40,444.81	-	-
Finger millet	-	-	-	-	178.66	1.82	-	-
Oats/'Aja'/	-	-	-	-	-	-	-	-
Rice	2,182.06	1,085.00	94.90	-	2,597.46	793.75	-	-
Pulse	6,183.89	1,157.70	1,902.57	2,428.04	11,271.51	1,912.95	2,157.52	2.60
Horse/Faba beans	401.62	615.00	220.49	669.63	428.37	296.05	-	-
Field peas	358.14	21.00	287.80	101.00	-	-	85.22	1.50
Haricot beans	614.92	160.00	171.06	1,634.18	4,647.80	238.00	-	-
Chick peas	3,143.35	81.70	14.28	2.02	-	-	-	-
Lentiles	10.83	1.00	-	-	-	-	-	-
Vetch/Grass peas	-	-	-	-	-	-	-	-
Soya beans	1,638.42	205.00	1,208.52	21.21	6,176.48	1,291.90	2,072.30	1.10
Fenugreek	-	-	-	-	-	-	-	-
Mung beans/"Masho"/	16.62	74.00	0.42	-	18.86	87.00	-	-
Gibto	-	-	-	-	-	-	-	-
Oile seeds	156,150.78	17,138.39	5,941.45	242.91	35,886.52	4,172.42	80.36	-
Nueg	-	-	-	-	-	-	-	-
Linseed	-	-	-	-	966.24	79.22	-	-
Ground nuts	950.63	22.40	-	-	126.60	12.80	-	-
Safflower	-	-	-	-	-	-	-	-
Sesame	148,435.82	15,824.04	5,941.45	242.91	27,886.24	2,726.40	80.36	-
Rapeseed	6,764.34	1,291.95	-	-	6,907.44	1,354.00	-	-
Vegetables	6,610.56	1,250.64	4,285.17	82.52	1,181.99	701.00	221.24	16.00
Lettuce	495.65	4.27	62.45	3.03	-	-	-	-
Head Cabbage	238.44	66.18	147.28	4.04	-	-	-	-
Ethiopian Cabbage	-	-	-	-	-	-	-	-
Tomatoes	3,243.95	742.16	2,029.39	21.41	376.49	30.00	211.74	15.00
Green peppers	328.83	66.80	287.54	35.35	-	-	9.50	1.00
Red papers	2,303.69	371.24	1,758.51	18.69	805.51	671.00	-	-
Swiss chard	-	-	-	-	-	-	-	-
Root crops	1,981.70	1,678.03	1,404.35	578.23	667.64	252.63	242.53	3.00
Beet root	3.06	0.05	-	-	-	-	-	-
Carrot	6.40	0.33	6.40	-	3.25	-	-	-
Onion	1,621.06	1,597.65	1,295.97	553.48	560.89	207.00	119.87	3.00
Potatoes	141.59	8.50	99.05	22.73	103.51	45.63	122.66	-
Garlic	-	-	-	-	-	-	-	-
Taro/'Godere'/	-	-	-	-	-	-	-	-
Sweet potatoes	209.59	71.50	2.92	2.02	-	-	-	-
Other Temporary	60,279.17	76,578.85	4,724.95	422.18	9,030.45	902.00	10,263.97	165.00
Permanent crops	-	-	-	-	-	-	-	-
Fruit crops	7,560.38	164,887.43	6,635.41	309.47	5,508.42	148,481.00	614.34	372.50
Avocado	1.89	7.00	-	-	-	-	-	-
Bananas	32.96	1.93	-	-	498.52	263.00	-	-
Guava/'Zeytun'/	-	-	-	-	-	-	-	-
Lemons	-	-	21.63	-	-	-	-	-
Mangos	1,433.61	230.25	1,566.01	306.44	568.51	267.00	614.34	372.50
Oranges	4,441.39	164,449.00	3,397.00	-	4,441.39	147,951.00	-	-
Papayas	1,650.53	199.25	1,650.76	3.03	-	-	-	-
Pineapples	-	-	-	-	-	-	-	-
Cash crpops	1,179,137.92	86,438.74	9,264.14	253,786.74	1,299,324.85	95,766.32	152,022.71	68,722.85
Chat	-	-	-	-	-	-	-	-
Coffee	7,127.77	386.00	-	-	73,125.97	35,509.87	122,160.20	43,993.15
Tea	-	-	-	-	9,373.21	6,537.00	19,598.54	24,564.70

Hopes/'Gesho'/	-	-	-	-	-	-	-	-
Enset	-	-	-	-	-	-	-	-
Sugar cane	1,111,730.98	9,473.89	4,539.19	253,364.56	1,207,795.22	52,817.45	-	-
Cotton	60,279.17	76,578.85	4,724.95	422.18	9,030.45	902.00	10,263.97	165.00
Other permanent crops	1,473.69	659.50	1,330.57	420.16	3,045.94	693.55	1,804.45	866.30

TABLE 4 contd
Tigray

TABLE 4 contd
Afar

TABLE 4 contd
Amhara

TABLE 4 contd
Oromia

TABLE 4 contd								
Somale								
	Pesticides		Fungicides		Herbicides		Other	
Type of crop								
	Area in Ha	Amnt in Qts		Area in Ha	Amnt in Qts		Area in Ha	Amnt in Qts
Total	-	-	-	-	-	-	-	-
Grains	-	-	-	-	-	-	-	-
Cereals	-	-	-	-	-	-	-	-
Teff	-	-	-	-	-	-	-	-
Barley	-	-	-	-	-	-	-	-
Wheat	-	-	-	-	-	-	-	-
Maize	-	-	-	-	-	-	-	-
Sorghum	-	-	-	-	-	-	-	-
Finger millet	-	-	-	-	-	-	-	-
Oats/'Aja'/	-	-	-	-	-	-	-	-
Rice	-	-	-	-	-	-	-	-
Pulse	-	-	-	-	-	-	-	-
Horse/Faba beans	-	-	-	-	-	-	-	-
Field peas	-	-	-	-	-	-	-	-
Haricot beans	-	-	-	-	-	-	-	-
Chick peas	-	-	-	-	-	-	-	-
Lentiles	-	-	-	-	-	-	-	-
Vetch/Grass peas	-	-	-	-	-	-	-	-
Soya beans	-	-	-	-	-	-	-	-
Fenugreek	-	-	-	-	-	-	-	-
Mung beans/"Masho"/	-	-	-	-	-	-	-	-
Gibto	-	-	-	-	-	-	-	-
Oile seeds	-	-	-	-	-	-	-	-
Nueg	-	-	-	-	-	-	-	-
Linseed	-	-	-	-	-	-	-	-
Ground nuts	-	-	-	-	-	-	-	-
Safflower	-	-	-	-	-	-	-	-
Sesame	-	-	-	-	-	-	-	-
Rapeseed	-	-	-	-	-	-	-	-
Vegetables	4.55	0.86	4.55	-	-	-	-	-
Lettuce	-	-	-	-	-	-	-	-
Head Cabbage	-	-	-	-	-	-	-	-
Ethiopian Cabbage	-	-	-	-	-	-	-	-
Tomatoes	1.28	0.50	1.28	-	-	-	-	-
Green peppers	3.27	0.36	3.27	-	-	-	-	-
Red papers	-	-	-	-	-	-	-	-
Swiss chard	-	-	-	-	-	-	-	-
Root crops	3.57	320.00	3.57	-	-	-	-	-
Beet root	-	-	-	-	-	-	-	-
Carrot	-	-	-	-	-	-	-	-
Onion	3.57	320.00	3.57	-	-	-	-	-
Potatoes	-	-	-	-	-	-	-	-
Garlic	-	-	-	-	-	-	-	-
Taro/'Godere'/	-	-	-	-	-	-	-	-
Sweet potatoes	-	-	-	-	-	-	-	-
Other Temporary	-	-	-	-	-	-	-	-

Permanent crops	-	-	-	-	-	-	-	-
Fruit crops	-	-	-	-	-	-	-	-
Avocado	-	-	-	-	-	-	-	-
Bananas	-	-	-	-	-	-	-	-
Guava/'Zeytun'/	-	-	-	-	-	-	-	-
Lemons	-	-	-	-	-	-	-	-
Mangos	-	-	-	-	-	-	-	-
Oranges	-	-	-	-	-	-	-	-
Papayas	-	-	-	-	-	-	-	-
Pineapples	-	-	-	-	-	-	-	-
Cash crpops	-	-	-	-	-	-	-	-
Chat	-	-	-	-	-	-	-	-
Coffee	-	-	-	-	-	-	-	-
Tea	-	-	-	-	-	-	-	-
Hopes/'Gesho'/	-	-	-	-	-	-	-	-
Enset	-	-	-	-	-	-	-	-
Sugar cane	-	-	-	-	-	-	-	-
Cotton	-	-	-	-	-	-	-	-
Other permanent crops	-	-	-	-	-	-	-	-

TABLE 4 contd
Benshangul-Gumuz

TABLE 4 contd
(S.N.N.P.R)

TABLE 4 contd								
Gambela	Pesticides		Fungicides		Herbicides		Other	
Type of crop	Area in Ha	Amnt in Qts		Area in Ha	Amnt in Qts		Area in Ha	Amnt in Qts
Total	4,488.70	2,690.00	94.90	-	1,708.25	500.00	-	-
Grains	1,743.31	1,990.00	94.90	-	1,708.25	500.00	-	-
Cereals	1,743.31	1,990.00	94.90	-	1,708.25	500.00	-	-
Teff	-	-	-	-	-	-	-	-
Barley	-	-	-	-	-	-	-	-
Wheat	-	-	-	-	-	-	-	-
Maize	35.06	990.00	-	-	-	-	-	-
Sorghum	-	-	-	-	-	-	-	-
Finger millet	-	-	-	-	-	-	-	-
Oats/'Aja'/	-	-	-	-	-	-	-	-
Rice	1,708.25	1,000.00	94.90	-	1,708.25	500.00	-	-
Pulse	-	-	-	-	-	-	-	-
Horse/Faba beans	-	-	-	-	-	-	-	-
Field peas	-	-	-	-	-	-	-	-
Haricot beans	-	-	-	-	-	-	-	-
Chick peas	-	-	-	-	-	-	-	-
Lentiles	-	-	-	-	-	-	-	-
Vetch/Grass peas	-	-	-	-	-	-	-	-
Soya beans	-	-	-	-	-	-	-	-
Fenugreek	-	-	-	-	-	-	-	-
Mung beans/"Masho"/	-	-	-	-	-	-	-	-
Gibto	-	-	-	-	-	-	-	-
Oile seeds	882.59	20.80	-	-	-	-	-	-
Nueg	-	-	-	-	-	-	-	-
Linseed	-	-	-	-	-	-	-	-
Ground nuts	882.59	20.80	-	-	-	-	-	-
Safflower	-	-	-	-	-	-	-	-
Sesame	-	-	-	-	-	-	-	-
Rapeseed	-	-	-	-	-	-	-	-
Vegetables	-	-	-	-	-	-	-	-
Lettuce	-	-	-	-	-	-	-	-
Head Cabbage	-	-	-	-	-	-	-	-
Ethiopian Cabbage	-	-	-	-	-	-	-	-
Tomatoes	-	-	-	-	-	-	-	-
Green peppers	-	-	-	-	-	-	-	-
Red papers	-	-	-	-	-	-	-	-
Swiss chard	-	-	-	-	-	-	-	-
Root crops	-	-	-	-	-	-	-	-
Beet root	-	-	-	-	-	-	-	-
Carrot	-	-	-	-	-	-	-	-
Onion	-	-	-	-	-	-	-	-

Potatoes	-	-	-	-	-	-	-	-
Garlic	-	-	-	-	-	-	-	-
Taro/'Godere'/	-	-	-	-	-	-	-	-
Sweet potatoes	-	-	-	-	-	-	-	-
Other Temporary	2,745.39	700.00	-	-	-	-	-	-
Permanent crops	-	-	-	-	-	-	-	-
Fruit crops	-	-	-	-	-	-	-	-
Avocado	-	-	-	-	-	-	-	-
Bananas	-	-	-	-	-	-	-	-
Guava/'Zeytun'/	-	-	-	-	-	-	-	-
Lemons	-	-	-	-	-	-	-	-
Mangos	-	-	-	-	-	-	-	-
Oranges	-	-	-	-	-	-	-	-
Papayas	-	-	-	-	-	-	-	-
Pineapples	-	-	-	-	-	-	-	-
Cash crpops	2,745.39	700.00	-	-	-	-	-	-
Chat	-	-	-	-	-	-	-	-
Coffee	-	-	-	-	-	-	-	-
Tea	-	-	-	-	-	-	-	-
Hopes/'Gesho'/	-	-	-	-	-	-	-	-
Enset	-	-	-	-	-	-	-	-
Sugar cane	-	-	-	-	-	-	-	-
Cotton	2,745.39	700.00	-	-	-	-	-	-
Other permanent crops	-	-	-	-	-	-	-	-

Appendix I Estimation procedure

The following formulas are used for estimation.

1. Estimating the total (For crop)

$$\hat{Y}_h = \sum_{i=1}^{nh} w_{hi}\, y_{hi}$$

In which

$$w = \frac{M_h}{}$$

Is the weight $_{hi}$

$_{hi}$ $_{h}$

Where

h = *Represents region*

n_h = *Total number of farms covered in the region*

M_h = *Measure of size of* h^{th} *region which is the total area in that region for those selected with less than 1 probability.*

M_{hi} = *Total area for farm i in* h^{th} *region*

y_{hi} = *Total for the variable in* i^{th} *farm* h_{th} *region*

2. Estimation for livestock

$$_{h} \sum _{hi} {}_{hi}$$

In which

$$w = \underline{N}^{\underline{h}\,hi} \qquad n$$

Is the weight

$_h$

Where

h = *Represents region*

N_h = *Measure of size for* h^{th} *region which is total number of farms having livestock in that region from the frame.*

n_h = *Total number of farms with livestock covered in that region* y_{hi} = *total for the variable in* i^{th} *farm* h_{th} *region*

3. *Estimating sampling variance*

   Sampling variance & estimate of stratum total are estimated by the

   Following formula

$\hat{\quad}$ $\frac{\lceil n_h}{\quad}$ $\hat{\quad}$

$\hat{\ }$ 2 ⎤

$$\mathrm{var}(Y\ ) =$$

n_h

$n_h - 1$

$$\left| \sum Y_{hi} \right|$$
$$\left\| \right._{i=1}$$

$$\left\lfloor \frac{Y_h}{n_h} \right\rfloor$$

4. *Estimating coefficient of variation*

   Coefficient of variation (CV) of estimate of region total is giv

   $CV\left(\hat{Y}\right)=$

$\frac{\text{var}(\hat{Y}_h)}{h} x100\%$

Appendix II

Questionnaire

Large and medium Scale Commercial Farms

2014/15

Appendix II

Central Statistical Agency

Large and Medium Scale Commercial Farm Sample Survey

2014/15

(2006 E.C) CF-Form 2006/1 Part 1.

Identification Particulars

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Region	***Zone***	***Wereda***	***Farm name***	***Kebele***	***Farm Tenure*** ***State = 1 Private= 2*** ***Coops= 3 Other= 4***	***Type of Holding*** ***Crop only , 1*** ***Livestock only, 2 Both 1&2 , 3***	***Statistical Branch Office***

Season Meher = 1 Belg , 2

Part 2 :- Crop land area and Quantity production of Major crops 2014/15 (2006 E.C)

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*		*10*
Sr. No	***Crop Type***	***Code***	***Cropped Area***		***Production***	***Yield (Qts/Ha)***	***Crop Damage Yes=1 No=2***	***Is there Crop Damage?***		
			From Interview method (In Hectare)	***From GPS Reading (In Hectare)***	***In Quintals***			***if Yes Reason***	***Code***	***Extent of Damage in Percent***
1	*Sesame*	*27*								
2	*Maize*	*02*								
3	*Sorghum*	*06*								
4	*Soyabens*	*12*								

5	Nueg	25								
6	Suffflower	28								
7	Linsed	23								
8	Ground NBut	24								
9	Coffee	72								

Part 2 :- Crop land area and Quantity production of Major crops 2014/15 (2006 E.C)

1	2	3	4	5	6	7	8	9		10
Sr. No	Crop Type	Code	Cropped Area		Production	Yield (Qts/Ha)	Crop Damage Yes=1 No=2	Is there Crop Damge?		
			From Interview method (In Hectare)	From GPS Reading (In Hectare)	In Quintals			If Yes Reason	Code	Extent of Damage in Percent
10	Sugar cane	76								
11	Teff	07								
12	Barely	01								
13	Wheat	08								
14	oats	04								
15	Rise	05								
16	Faba Beans	13								
17	Haricot Beans	15								
18	Soyabenns	18								
19	Chick pease	11								
20	Lintils	14								
21	Redpeper	38								
22	Foselia/Fajoli	70								
23	orange	47								
24	Banana	42								
25	Apple	113								
26	Grapes	43								
27	Others									

Part 3- Information on Different Agricultural Practices 2014/15 (2006 E.C)

1	2	3	4	5	6	7	8	9
			Farm in put listed in Col. 2	Applied		Type of input Used		

SR.

SR. No.	Type of Farm Input	Code	Farm in put listed in Col. 2 Applied			Type of input Used			Production per Hectare
			Crop Name	Code	Field area in Hectare	Unit Kilogram- 1 Litter= 2 Quintal =3 Other = 4		Amount	

Name *Signature* *Date*

Enumerator ---------- ---------- ----------