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CENTRAL STATISTICAL AUTHORITY

AGRICULTURAL SAMPLE SURVERY

2004/05(1997 E.C) VOLUME V

REPORT ON AREA AND PRODUCTION OF BELG SEASON CROPS FOR PRIVATE PEASANT HOLDINGS

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I. INTRODUCTION AND OBJECTIVES OF THE SURVEY

1.1 INTRODUCTION

As it is true in most developing countries, in Ethiopia agriculture is the dominant sector of the economy. As a result of this, Ethiopian agriculture contributes the lion share of the GDP and foreign currency earnings of the country from the sell of agricultural outputs abroad as well as it creates employment opportunity to the majority of the country's population. Hence, agriculture is the major sector expected to play a dominant role to bring about an overall sustainable economic growth to the country, if strenuous efforts are made to modernize the farm activity of the sector as a whole.

Among the number of efforts that should be made by the concerned stakeholders to meet the desired goal mentioned above, the availability of reliable, comprehensive and timely statistical information on the overall performance of the sector is considered essential for use as a primary input to the planning, monitoring and evaluation of agricultural development.

In order to minimize the existing data gap, therefore, for the past three decades, the Central Statistical Authority (CSA) has been conducting the agricultural sample survey under which four integrated sample surveys designed for the collection of agricultural information on the performances of the sector were launched all over the country on annual basis. Hence, through performing these surveys, CSA used to disseminate the results obtained from these surveys to ultimate users annually. The 2004/05 (1997 E.C.) Belg Season Crop Production Sample Survey, for which this report is meant for, is among the four integrated sample surveys launched on annual basis under the umbrella of the agricultural sample survey all over the country.

This report, which is Volume IV of the six series of reports, presents quantitative results on crop land area, production, and yield of major Belg crops, grown during the 2004/05 Belg season by private peasant holdings as obtained from the results of the year 2004/05 (1997 E.C.) Belg Season Crop Production Sample survey.

1.2 Objectives of the Survey

The objectives of the **2004/05 (1997 E.C.)** Belg Season Crop Production Sample Survey is to produce basic quantitative information on cropland area, production and yield of major Belg season crops, as well as to provide quantitative information on:-

- cropland area, production and yield of major belg season crops, and
- the extent and use of different farm management practices on belg season crops such as fertilized crop land area and quantity of fertilizer used by crop and fertilizer type, irrigated crop land area under improved seed, pesticide treated cropland area … etc.

The adequate and timely supply of this information to ultimate users is therefore, important for use as a primary input in the process of policy formulation, designing developmental agricultural projects and programmmes. This report therefore presents quantitative information on the above-mentioned major variables at country and regional levels.

II. Survey Methodology, Data Collection and Processing

2.1 Scopes and Coverage

The 2004/5 (1997 E.C) Annual Agricultural Sample Survey (Belg Season) covered the entire rural parts of the country except three zones of Afar regional state and six zones of Somali regional state where its inhabitants are predominantly pastoralists. Accordingly the survey took into account of all parts of Harari, Addis Ababa and Dire Dawa, and 58 additional Zones / Special Weredas (that are treated as zones) of other regions. Besides, the survey could not also be accomplished in all the zones of Gambella region.

Initially, a total of 2,016 enumeration areas were selected to be covered by the survey, and the survey was successfully carried out in all sampled (100 %) EA's. As regard to the ultimate sampling unit, it was planned to conduct the survey on 50,400 agricultural households and 50,131 (99.47 %) households were actually covered by the Belg season

Agricultural Sample Survey. Distribution of the number of sampling units (planned and covered) by reporting level is presented in Table 2.1 below.

Table 2.1. Number of Zones / Strata Covered, Planned and Covered Enumeration Areas & Households by reporting level.

Reporting level	Number of Zones Covered	Enumeration Areas		Households	
		Planned	Covered	Planned	Covered
Tigray	5	164	164	4100	4063
Afar	2	56	56	1400	1398
Amhara	10	396	396	9900	9843
Oromia	14	536	536	13400	13349
Somali	3	84	84	2100	2076
Benishangul-Gumuz	3	84	84	2100	2083
SNNP	21	624	624	15600	15520
Harari*	1	24	24	600	600
Addis Ababa*	1	24	24	600	600
Dire Dawa*	1	24	24	600	599
Total	**61**	**2016**	**2016**	**50400**	**50131**

**** = Values for these regions refer only the number of strata (domain of estimation)***

2.2 Sample Design

A stratified two-stage cluster sample design was used to select the sample. Enumeration areas (EA's) were taken to be the primary sampling units (PSU's) and the secondary sampling units (SSU's) were agricultural households. Sample enumeration areas from each stratum were sub-samples of the 2001/2 (1994 E.C) Ethiopian Agricultural Sample Enumeration. They were selected using probability proportional to size systematic sampling; size being number of agricultural households obtained from the 1994 Population & Housing Census and adjusted for the sub-sampling effect. Within each sample EA a fresh list of households was prepared and 25 agricultural households from each sample EA were systematically selected at the second stage. The survey questionnaire was finally administered for those 25 agricultural households selected at the second stage. Information on area under crops, Belg season production of crops, agricultural practices, crop damage, and quantity of agricultural inputs used were obtained from the 25 households that were ultimately selected.

The sample size for the (2004/5) agricultural sample survey was determined by taking in to account of both the required level of precision for the most important estimates within each domain and the amount of resources allocated to the survey. In order to reduce non-sampling errors manageability of the survey in terms of quality and operational control was also in addition considered.

Except Harari, Addis Ababa and Dire Dawa, where the region as a whole were taken to be the domain of estimation, each zone of a region / special wereda that is considered to be a zone by itself was adopted as a stratum for which major findings of the survey are computed. However, by aggregating the results obtained from each zone the final report is provided only at regional & country level.

Estimation procedure for totals & ratios and their sampling errors are given in Appendix I. Estimates of standard errors and Coefficient of Variations for selected estimates are also presented in Appendix II.

Remark: As of the 2001/2 Ethiopian Agricultural Sample Enumeration, Addis Ababa City Administration had a total of 35 enumeration areas. However, during the 2004 Urban Economic Establishments Census it was found that some of the rural enumeration areas (EAs) were to be part of the urban areas of the city. Consequently only 24 enumeration areas were left as the rural EAs of the City Administration. Therefore, the 2004/5 (1997 E.C) annual Agricultural Sample Survey (Belg Season) covered all the 24 EAs with certainty. Hence, there could be great variation among estimates of area & crop production of the 2004/5 (1997 E.C) and that of the previous years.

2.3 Field Organization

The Central Statistical Authority (CSA) branch statistical office heads, field supervisors and enumerators, other supporting staff and drivers were all involved in the field operation activities of the **2004/05 (1997 E.C.)** Belg season Crop Production Sample survey. To accomplish the data collection activities, all field enumerators were equipped with the necessary survey equipment (i.e. compass, programmable calculator, protractor, ruler, measuring tape, balance scale, iron peg, ropes, sample bags…etc) at the completion of training. To assist with the fieldwork and data collection activities all available four-wheel drive vehicles were used for supervision and collection of completed questionnaires.

2.4 Training of Field Staff

The field staff-training program was carried out in two stages. The first stage consisted of trainees from the head office, branch statistical office heads statisticians and some of the field supervisors have been given training for one week at CSA's headquarters in Addis Ababa. Many of those trained in the first stage conducted similar training for field supervisors and enumerators for 10 days in CSA's 24 branch statistical offices, which are distributed all over the country. During the second stage training, the field staff were given detailed classroom instruction on the objectives and uses of the Agricultural Sample Survey (AgSS) concepts, and definitions of terms used, the method of area measurement, method of crop cutting, as well as correct interviewing procedures, … etc. The enumerators' and supervisors' training also included a field practice to reinforce the concepts discussed in the classroom with regard to field measurement and crop cutting data collection.

2.5 Methods of Data Collection.

Except Cropland area of major Belg Season Crop, the data of which collected objectively using compasses and measuring tape, the information on production of major Belg Season crops and agricultural practices (uses of fertilizer, pesticide, improved seed and

irrigation) were subjectively collected by interviewing the holders of sampled households. **Appendix II,** illustrates the total number of EAs and households reporting for the **2004/05 (1997 E.C.)**Belg crop productions by region.

A major characteristic of Ethiopian agriculture is the existence of two well-known crop production seasons referred to as the Meher (or main) and Belg Seasons. The generally accepted definition of the Meher season is that of the long rainy season, which normally occurs from June to September. The Belg Season most often refers to small but timely rainy season, which normally occurs from February to May but in limited areas of the country. Generally, the Meher Season rainy period provides ideal growing conditions for the longer maturing crops. Planting and harvest of Meher crops can extend to December or January in some areas. Most of the time holders rely on short maturing crops for planting during the Belg rainy period and harvest of the crops is in June or July.

A point of contention arises with respect to the pure definition of the Belg crop. Belg cropping practices are heterogeneous across different portions of the country. The nature of the sowing period also overlaps with some of the Meher Season crops. Consequently, the report on Belg Season crops in the past faced a problem of a clearly defined growing period. It is important not to overlook or miss agricultural practices performed all year round due to use of irrigation or soil moister from sufficiently dried areas that from time-to-time are swampy or marshy. To help clarify the two-crop season, the following definition has been in use since 1987/88:

Belg Season Crops were defined as any crops that are harvested during the months of March to August, while those crops that are harvested during September to February are considered Meher (or main) season crops.

This report consists of estimates of area, production and yield per hectare of major Belg Season crops for the year **2004/05 (1997 E.C.)** The data collection period for obtaining the area, production and agricultural practices of the Belg season crops ranged from '**Sene' 15-30, 1996 E.C**. (i.e**. From June 23 to July 7, 2004**). Data on area under

Belg season crop are collected objectively using compass and measuring tapes, while data on production of belg season crops were using subjective method based on face-to-face interviewing of the holder by the enumerator. Data on production of belg season crops are usually reported in local production measuring units that require conversion to an equivalent metric unit using the conversion factors available for local units at Wereda level prepared by CSA. The conversions factors have been constructed from experimentally derived data using actual holder production data associated with each local unit.

2.6 Data Processing

a. Editing, Coding and Verification

To insure the quality of the collected survey data an editing, coding, and verification instruction manual was written, and seventeen editors, data coders and verifiers were trained for one day to edit, code and verify the data using the aforementioned manual as a reference and teaching aid.

The enumerator completed edited and coded questionnaires sent to the head office were thoroughly verified by trained verifiers on a **100%** basis before the questionnaires were sent to the data entry unit. The editing, coding, verification and data entry of all questionnaires was completed in thirty-one days.

b. Data Entry, Cleaning and Tabulation

Before starting data entry computer edit specifications were prepared for use on personal computers, utilizing the Integrated Microcomputer Processing System (IMPS) Software for data consistency checking purposes.

The data on the coded questionnaires were then entered into the IMPS software on personal computers. The data was then checked and cleaned using the computer edit specifications prepared earlier for this purpose. Fifty-six data encoders were involved in

this total process and it took fourteen days to complete the job. Finally, tabulation was done on personal computers to produce results as indicated in the tabulation plan.

2.7 BASIC CONCEPTS AND DEFINITIONS

For better understanding and ultimate use of the data presented in this report, the definitions of concepts and terminology used for the collection of all types of data of the **2004/05 (1997 E.C.)** Belg season Crop Production Sample survey are presented here below: -

Enumeration Area (EA): An Enumeration Area_in rural parts of the Country is a locality that is less than or equal to a farmer's association area and usually it consists of 150-200 households.

Household:- A household may be either;

a) a one person household, that is a person who makes provision for his own food or other essentials for living without combining with any other person to form part of a multi person household or
b) a multi person household, that is, a group of two or more persons who live together and make common provision for food or other essentials for living. The persons in the group may pool their incomes and have a common budget to greater or lesser extent. They may be related unrelated persons, or a combination of both.

Agricultural Household:- A household is considered an agricultural household when at least one member of the household is engaged in growing crops and/or breeding and raising livestock in private or in partnership with others.

Holder:- A holder is a person who exercises management control over the operations of the agricultural holding and takes the major decision regarding the utilization of the available resources. He has technical and economic responsibility for the holding. He may operate the holding directly as an owner or as a manager.

Under conditions of traditional agricultural holding the holder may be regarded as the person, who with or without helps, of others, operates land or raises livestock in his own right, i.e. the person who decides on what, when where and how to grow crops or raise livestock and has right to determine the utilization of the products.

Holding: - A holding is all the land and livestock kept which is used wholly or partly for agricultural production and is operated as one technical unit by one person alone, or with others, without regard to title, legal form, size or location.

Parcel: - A parcel of holding is any piece of land entirely surrounded by land, Water, road, forest, … etc. Which is not part of the holding. It may consist one or more cadastral units, plots or field adjacent to each other.

Field: - A field is defined as any plot of land, which is a parcel or part of a parcel under the same crop.

Belg Season Crops: - are defined as any crops that are harvested during the months of March (Megabit) to August (Nehase).

Meher Season Crops: - are those crops that are harvested during September (Meskerem) to February (Yekatit) are considered as main (Meher) season crops.

Irrigated area: - refers to the area of land purposely and actually provided with water, other than by rain, for improving the production of crops. The uncontrolled flooding of land by the over flow of rivers or streams is not categorized as irrigation practice although sometimes farmers use this incidence for production.

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 anything added to the soil intended to increase the amount of plant nutrients available for crop growth. Usually fertilizers are divided into two parts, Natural and commercial. Examples of natural fertilizers are farmyard manure and wood ashes

while commercial fertilizers are DAP (Di-Ammonium phosphate) and UREA (Ammonium Nitrate).

Pesticides: Pesticides are chemicals useful for the mitigation, control or elimination of pests which are trouble some or harmful to crop. Insecticides, herbicides and fungicides are all considered as pesticides.

III. SUMMARY OF THE MAJOR FINDINGS OF THE SURVEY.

In this part of the report the estimates of total Belg cropland area and production of the **2004/05 (1997 E.C.)** Belg season are presented. The following are discussions on the major findings of the **2004/05** Belg season crop production survey.

According to the **2004/05 (1997 E.C.)**Belg season crop production sample survey results, it is estimated that major Belg crops covered about **982.80** thousand hectares of land and a total of **6670.91**thousand quintals of production was obtained at country level. Out of this total cropland area under Belg crops, the highest which is about **796.49** thousand hectares **(81.04%)** were under cereals followed by pulses that covered about **176.64** thousand hectares **(17.97%),** and about **9.67** thousand hectares **(0.99%)** were covered by oilseed crops.

From the above-mentioned total cropland area, an estimated production of about **6236.55** thousand quintals **(93.49%)** and **421.41** thousand quintals **(6.32%)** of cereals and pulses are obtained at country level, respectively.

Summary Table A. Estimates of Total Area and Production of Major Belg season Crops for Private Peasant Holdings in Ethiopia, 2004/05 (1997 E.C.)

Crop Type	Total Area		Total Production	
	In thousands (ha.)	%	In thousands (Ql.)	%
Cereal	796.49	81.04	6236.55	93.49
Pulses	176.64	17.97	421.41	6.32
Oilseeds	9.67	0.99	*	*
All Crops	982.80	100.00	6670.91	100.00

3.1. General Over-view on the Performance of Crop Production Activities of the 2004/05 Belg Season as compared to the 2003/04(1996 E.C.)

In this section of the report an attempt is made to compare the performance of Belg seasons of the year **2003/04 (1996 E.C.)** with that of the **2004/05 (1997 E.C.)**Belg Season in terms of total cropland area, production and yield of major Belg season crops. (See Tables 1 and 2).

As indicated in Table 1, one can easily observe that the **2004/05 (1997 E.C.)** Belg season crop production activities is better, by 9.51% for area and by 101.94% for production, when compared to the **2003/04 (1996 E.C.)** Belg season cropland area and production estimates. A very clear indicator for this is that in the year **2004/05** Belg season crop production activities, Belg crops were grown on a total area of **982.80** thousand hectares with a corresponding production of 6670.91 thousand quintals; where as the estimates of area and production for the year **2003/04** were **897.42** thousand hectares and **2704.84** quintals, respectively.

A close evaluation of the performance of each Belg crop have indicated that some of the Belg crops like, teff,, haricot beans and barley have shown a significant increase in crop production, i.e. **1198.28%** increase in crop area and **2178.01%** increase in production for teff, through **2.60%** increase in crop area and **517.54%** increase in production for barley. (For details see Table 1)

As it can be observed from the comparison made in both tables (Tables 1 and 2), one can easily conclude that both the total area covered by Belg Season crops and the respective volume of production produced in the year **2004/05(1997 E.C)** has shown a significant increase compared to that of the year **2003/04 (1996 E.C)**.

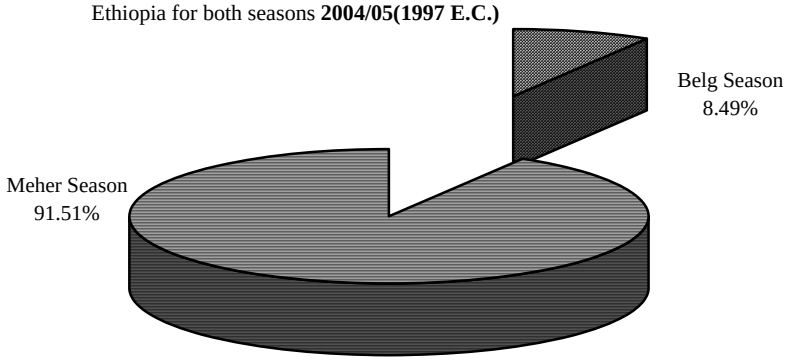
3.2 Results of 2004/05 (1997 E.C.)Both Seasons (Meher and Belg)

In this section of the report, an attempt is made to present the total cropland area and production of major crops obtained during the year **2004/05 (1997 E.C.)** both season harvest. Accordingly, Summary Table B-D presents the estimates of area and production of major crops for both Meher and Belg seasons.

The total area and production of major crops in **2004/05 (1997 E.C.)** both seasons, was estimated to be **10.72** million hectares and **125.75** million quintals, respectively.

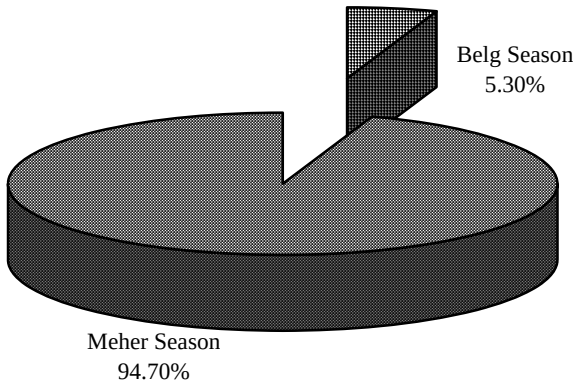
Out of the above mentioned totals, **0.91 (8.49%)** million hectares and **6.67(5.30%)** million quintals was the contribution of Belg season. (For the details see Figs 1 and 2, and Summary Tables B and C).

Figure 1.Estimates of total area under major crops for private holdings in Ethiopia for both seasons **2004/05(1997 E.C.)**



Out of the total output of major crops (both Meher and Belg Seasons) of **2004/05 (1997 E.C.)** the total area under Cereals accounted for about **8.44** million hectares **(78.73%)** with a production of **106.55**million quintals **(84.73%).**

Figure2. Estimates of total production of major crops for private holdings in Ethiopia for both seasons **2004/05 (1997 E.C)**



About **1.45** million hectares **(13.53%)** with a production of **13.80** million quintals **(11.05%)** accounted for pulses, and **0.83** million hectares **(7.74%)** with a production of **5.27** million quintals **(4.22%)** accounted for oil seeds. For details see summary Table B).

Summary Tabel B. Total Area and Production of Major Crops for Private Peasant Holdings in Ethiopia Both Seasons, 2004/05 (1997 E.C.)

TYPE OF CROP	AREA IN MILLION HECTARES					
	MEHER	%	BELG	%	BOTH	%
CEREALS	7.64	77.88	0.80	87.91	8.44	78.73
PULSES	1.35	13.76	0.18	10.99	1.45	13.53
OILSEEDS	0.82	8.36	0.01	1.10	0.83	7.74
Total	9.81	100.00	0.91	100.00	10.72	100.00
TYPE OF CROP	**PRODUCTION IN MILLION QUINTALS**					
	MEHER	**%**	**BELG**	**%**	**BOTH**	**%**
CEREALS	100.31	84.24	6.24	93.49	106.55	84.73
PULSES	13.50	11.34	0.42	6.32	13.92	11.07
OILSEEDS	5.27	4.42	*	*	*	*

3.3 Comparison of 2003/04 and 2004/05 of Both Seasons (Meher and Belg)

Area and production of Major Crops

Comparison of the total area and production of **2003/04 (1996E.C.)** and **2004/05 (1997 E.C.)** was made for both seasons and Belg season separately, in summary Tables C and D, respectively.

Summary Table C. Total Cropland area and Production of Major Crops for Private Peasant Holdings in Ethiopia (Both seasons), 2003/04 (1996 E.C.) and 2004/05 (1997 E.C.)

TYPE OF CROP	AREA IN MILLION HECTARES			PROD. IN MILLION QUINTALS		
	2003/04 (1996 E.C)	**2004/05 (1997 E.C)**	**%** age CHANGE	2003/04 (1996 E.C)	**2004/05 (1997 E.C)**	**%** age CHANGE
CEREALS	7.79	**8.44**	**8.34**	92.71	106.55	**14.93**
PULSES	1.20	**1.45**	**20.83**	10.42	13.92	**33.59**
OILSEEDS	0.58	**0.83**	**43.10**	3.13	*	*****
TOTAL	9.57	**10.72**	**12.02**	106.26	125.75	**18.34**

Accordingly, the **2004/05 (1997 E.C.)** both seasons' total outputs of the major crops have increased by **12.02%** in area, and by **18.34%** in production as compared to the **2003/04(1996)** results. Similarly, the **2004/05 (1997 E.C.)** total area and production for major Belg Season crops has increased by **11.24% and 146.13%,** respectively, as compared to the **2003/04 (1996 E.C**) Belg Season crops. For details refer to summary Table D.

Summary Table D. Total Cropland Area and Production of Major Belg Season Crops For Private Peasant Holdings in Ethiopia, 2003/04 (1996 E.C.) and 2004/05 (1997 E.C.) Belg Season

TYPE OF CROP	BELG SEASONS					
	AREA IN MILLION HECTARES			PRODUCTION IN MILLION QUINTALS		
	2003/04 (1996 E.C)	2004/05 (1997 E.C)	**%** age CHANGE	2003/04 (1996 E.C))	2004/05 (1997 E.C)	**%** age CHANGE
CEREALS	0.79	0.80	**1.27**	2.65	6.24	**135.47**
PULSES	0.10	0.18	**80.00**	0.05	0.42	**740.00**
OILSEEDS	0.01	0.01	**0.00**	*	*	*****
TOTAL	0.90	0.99	**11.24**	2.71	6.67	**146.13**

Comparison of the total area and production of **2003/04 (1996E.C.)** and **2004/05 (1997 E.C.)** was made for Belg reporting regions, and is presented in Table 2.

When we compare nationally, the general trend shows an increase in both area and production. An independent observation of each region actually shows a decrease of area in Tigray, Afar and Somale Regions. On the other hand, an increase in production had been observed in Somale, S.N.N.P, Amhara, and Oromiya, out of which the increase in area of Harari and the increase in production of Somale are significant, i.e, 375.00% and 2424.58%, respectively. Tigray region is the only region in which a decrease in production has been observed.

NOTES: -

1. *Some estimates in all reporting levels are excluded due to high coefficient of variations. Nevertheless, they are incorporated in the total estimates. Hence the sum of the specific estimates may not be equal to the total estimates.*

2. *Users are also advised to use those estimates with 30-50% coefficient of variation* (CV) *cautiously*

3. *Even though area is reported for some crops in some reporting levels, no production data is available such cases are designated by Not Stated* (NS). *On the other hand, in all tables* "-" *labeled for data not available totally.*

4. *All Estimates Exclude Gambella Region*

Table 1. Estimates of 2003/04 (1996 E.C.) and 2004/05 (1997 E.C.) Area, Production and Yield of Major Belg Season Crops for PrivatePeasant Holdings, in Ethiopia

Crop Type	Total Area ('000 Ha)			Total Production ('000 Qt)			Yield		
	2003/04 (1996 E.C.)	2004/05 (1997 E.C.)	% Change	2003/04 (1996 E.C.)	2004/05 (1997 E.C.)	% Change	2003/04 (1996 E.C.)	2004/05 (1997 E.C.)	% Change
Grain Crop	**897.42**	**982.80**	**9.51**	**2704.83**	**6670.91**	146.63			
Cereals	**786.55**	**796.49**	**1.26**	**2652.02**	**6236.55**	135.16			
Teff	7.54	97.89	1198.28	9.73	221.65	2178.01	1.29	2.26	75.13
Barley	155.31	159.35	2.60	76.87	474.7	517.54	0.49	2.98	502.09
Wheat	67.42	59.28	-12.07	36.52	*	*	0.54	*	*
Maize	424	408.65	-3.62	2009.15	5121.52	154.91	4.74	12.53	164.43
Sorghum	52.18	57.84	10.85	418.29	19.57	-95.32	8.02	*	*
Finger Millet	*	1.62	*	*	0.87	*	*	*	*
Oats/'Aja'	11.8	11.78	-0.17	*	11.32	*	*	*	*
Rice	*	*	*	*	*	*	*	*	*
Pulses	**101.63**	**176.64**	**73.81**	**48.83**	**421.41**	763.01			
Fabab Beans	1.45	2.16	48.97	*	*	*	*	*	*
Field Peas	17.2	20.68	20.23	*	16.19	*	*	*	*
Haricot Beans	57.21	125.39	119.17	33.04	327.05	889.86	0.58	2.61	351.93
Chick Peas	13.81	13.51	-2.17	*	12.63	*	*	*	*
Lentils	5.74	12.29	114.11	*	5.58	*	*	*	*
Grass Peas	3.9	*	*	*	*	*	*	*	*
Soya Bean	*	*	*	*	-	*	*	-	*
Fenugreek	1.57	*	*	*	0.46	*	*	*	*
Gibto	*	*	*	*	-	*	*	-	*
Oilseeds	**9.24**	**9.67**	**4.65**	*****	*****	*			
Neug	7.62	*	*	*	*	*	*	*	*
Line Seed	*	5.77	*	*	*	*	*	*	*
Groundnuts	*	*	*	*	*	*	*	*	*
Sufflower	*	0.31	*	*	*	*	*	*	*
Sesame	*	*	*	*	*	*	*	*	*
Rapeseed	0.08	0.34	*	*	*	*	*	*	*

* Excluding Gambella Region

Table 2. Estimates of 2003/04(1996 E.C.) and 2004/05(1997 E.C.) Area and Production of Major Belg Season Crops for Private Peasant Holdings in Ethiopia, by Region

Region	Area under major crops ('000 Ha)			Production under major crops ('000 Qt)		
	2003/04 (1996 E.C)	2004/05 (1997 E.C)	% Change	2003/04 (1996 E.C)	2004/05 (1997 E.C)	% Change
Tigray	25.00	22.56	-9.76	68.38	33.36	-51.21
Afar	12.42	1.23	-90.10	*	*	*
Amhara	103.12	132.91	28.89	116.48	170.44	46.33
Oromiya	468.19	473.46	1.13	1757.49	1943.51	10.58
Somali	12.84	11.61	-9.58	2.36	59.58	2424.58
Benshangul-Gumz	0.82	1.16	41.46	*	*	*
S.N.N.P	285.98	339.34	18.66	741.00	4452.42	500.87
Gambela	NA	NA	NA	NA	-	-
Harari	0.08	0.38	375.00	*	*	*
Addis Ababa	-	-	-	-	-	-
Dire Dawa	0.15	0.15	0.00	*	0.25	-
All Regions	**908.6**	**982.8**	**8.17**	**2685.71**	**6670.91**	**148.39**

Table 3. Cropland Area, Production and Yield of Major Belg Crops For Private Peasant Holdings For Belg Season 2004/05 (1997 E.C.)

Ethiopia

Crop Name	Number Of Holders	Cropland Area In Hectares	%	Production In Quintals	%	Yield QT/HA
Grain Crops	**3851848**	**982796.71**	**100**	**6670904.8**	**100**	
Cereals..... .	**3572691**	**796488.33**	**81.04**	**6236551.91**	**93.49**	
Teff..... .	362475	97886.21	9.96	221650.36	3.32	2.26
Barley..... .	694823	159348.43	16.21	474695.07	7.12	2.98
Wheat..... .	235925	59257.03	6.03	*	*	*
Maize..... .	2797535	408649.24	41.58	5121519.46	76.77	12.53
Sorghum..... .	267219	57843.09	5.89	19567.5	0.29	*
Finger millet..... .	16324	1620.43	0.16	868.67	0.01	*
Oats/'Aja'..... .	81064	11783.62	1.2	11321.32	0.17	*
Rice..... .	1596	*	*	*	*	*
Pulses..... .	**1943395**	**176635.93**	**17.97**	**421409.73**	**6.32**	
Faba Beans	52175	2158.45	0.22	*	*	*
Field peas..... .	138959	20681.55	2.1	16186.02	0.24	*
Haricot beans..... .	1719178	125384.75	12.76	327047.18	4.9	2.61
Chick-peas..... .	88421	13508.45	1.37	12628.06	0.19	*
Lentils..... .	95980	12290.08	1.25	5575.65	0.08	*
Grass Peas	25234	*	*	*	*	*
Soya beans..... .	*	*	*	-	-	-
Fenugreek..... .	12387	*	*	461.02	-	*
Gibto..... .	*	*	*	-	-	-
Oilseeds..... .	**83828**	**9672.45**	**0.98**	*****	*****	
Neug..... .	*	*	*	*	*	*
Linseed..... .	22307	5767.79	0.59	*	*	*
Groundnuts..... .	21176	*	*	*	*	*
Sufflower..... .	13001	311.56	0.03	*	*	*
Sesame..... .	4917	*	*	*	*	*
Rapeseed..... .	23283	336.1	0.03	*	*	*

Table 4. Cropland Area, Production and Yield of Major Belg Crops For Private Peasant Holdings For Belg Season 2004/05 (1997 E.C.)

Tigray Region

Crop Name	Number Of Holders	Cropland Area In Hectares	%	Production In Quintals	%	Yield QT/HA
Grain Crops	**69849**	**22555.6**	**100**	**33361.12**	**100**	
Cereals..... .	**67755**	**22195.98**	**98.41**	**32849.43**	**98.47**	
Teff..... .	26982	14884.82	65.99	13128.52	39.35	*
Barley..... .	14261	1302	5.77	1913.11	5.73	1.47
Wheat..... .	*	*	*	*	*	*
Maize..... .	31341	4342.25	19.25	16176.17	48.49	3.73
Sorghum..... .	*	*	*	*	*	*
Finger millet..... .	*	*	*	*	*	*
Oats/'Aja'..... .	-	-	-	-	-	-
Rice..... .	-	-	-	-	-	-
Pulses..... .	**3811**	**328.51**	**1.46**	**488.74**	**1.47**	
Faba Beans	*	*	*	*	*	*
Field peas..... .	*	*	*	*	*	*
Haricot beans..... .	-	-	-	-	-	-
Chick-peas..... .	*	*	*	*	*	*
Lentils..... .	*	*	*	*	*	*
Grass Peas	-	-	-	-	-	-
Soya beans..... .	-	-	-	-	-	-
Fenugreek..... .	*	*	*	*	*	*
Gibto..... .	-	-	-	-	-	-
Oilseeds..... .	*****	*****	*****	*****	*****	
Neug..... .	-	-	-	-	-	-
Linseed..... .	*	*	*	*	*	*
Groundnuts..... .	-	-	-	-	-	-
Sufflower..... .	*	*	*	-	-	-
Sesame..... .	-	-	-	-	-	-
Rapeseed..... .	*	*	*	-	-	-

Table 5. Cropland Area, Production and Yield of Major Belg Crops For Private Peasant Holdings For Belg Season 2004/05 (1997 E.C.)

Afar Region

Crop Name	Number Of Holders	Cropland Area In Hectares	%	Production In Quintals	%	Yield QT/HA
Grain Crops	**2799**	**1226.14**	**100**	*****	*****	
Cereals..... .	**2799**	**1144.12**	**93.31**	*****	*****	
Teff..... .	1633	370.52	30.22	*	*	*
Barley..... .	-	-	-	-	*	-
Wheat..... .	-	-	-	-	*	-
Maize..... .	*	*	*	*	*	*
Sorghum..... .	-	-	-	-	*	-
Finger millet..... .	-	-	-	-	*	-
Oats/'Aja'..... .	-	-	-	-	*	-
Rice..... .	-	-	-	-	*	-
Pulses..... .	**417**	**68.66**	**5.6**	*****	*****	
Faba beans..... .	-	-	-	-	*	-
Field peas..... .	-	-	-	-	*	-
Haricot beans..... .	*	*	*	*	*	*
Chick-peas..... .	259	50.45	4.11	-	*	-
Lentils..... .	-	-	-	-	*	-
Grass Peas	-	-	-	-	*	-
Soya beans..... .	-	-	-	-	*	-
Fenugreek..... .	-	-	-	-	*	-
Gibto..... .	-	-	-	-	*	-
Oilseeds..... .	*****	*****	*****	**-**	*****	
Neug..... .	-	-	-	-	*	-
Linseed..... .	-	-	-	-	*	-
Groundnuts..... .	-	-	-	-	*	-
Sufflower..... .	-	-	-	-	*	-
Sesame..... .	*	*	*	-	*	-
Rapeseed..... .	-	-	-	-	*	-

Table 6. Cropland Area, Production and Yield of Major Belg Crops For Private Peasant Holdings For Belg Season 2004/05 (1997 E.C.)

Amhara Region

Crop Name	Number Of Holders	Cropland Area In Hectares	%	Production In Quintals	%	Yield QT/HA
Grain Crops	**480290**	**132908.26**	**100**	**170438.61**	**100**	
Cereals..... .	**434737**	**93863.91**	**70.62**	**144901.33**	**85.02**	
Teff..... .	133801	23533.93	17.71	49936.65	29.3	2.12
Barley..... .	191047	45690.36	34.38	56814.98	33.33	1.24
Wheat..... .	69093	9623.8	7.24	19152.33	11.24	1.99
Maize..... .	146366	12034.51	9.05	17021.36	9.99	1.41
Sorghum..... .	*	*	*	*	*	*
Finger millet..... .	*	*	*	*	*	*
Oats/'Aja'..... .	20892	1725.32	1.3	1913.1	1.12	1.11
Rice..... .	*	*	*	*	*	*
Pulses..... .	**174155**	**38747.81**	**29.15**	**25234.96**	**14.81**	
Faba beans..... .	*	*	*	*	*	*
Field peas..... .	30021	2841.77	2.14	2261.96	1.33	*
Haricot beans..... .	58839	*	*	4371.15	2.56	*
Chick-peas..... .	75293	11909.73	8.96	11543.93	6.77	*
Lentils..... .	60737	8979.37	6.76	4595.35	2.7	*
Grass Peas	22642	*	*	*	*	*
Soya beans..... .	-	-	-	-	-	-
Fenugreek..... .	5304	*	*	*	*	*
Gibto..... .	-	-	-	-	-	-
Oilseeds..... .	**7348**	*****	*****	*****	*****	
Neug..... .	*	*	*	*	*	*
Linseed..... .	4126	*	*	30.42	0.02	*
Groundnuts..... .	-	-	-	-	-	-
Sufflower..... .	*	*	*	*	*	*
Sesame..... .	-	-	-	-	-	-
Rapeseed..... .	*	*	*	*	*	*

Table 7. Cropland Area, Production and Yield of Major Belg Crops For Private Peasant Hodings For Belg Season 2004/05 (1997 E.C.)

Oromia Region

Crop Name	Number Of Holders	Cropland Area In Hectares	%	Production In Quintals	%	Yield QT/HA
Grain Crops	**1634383**	**473461.07**	**100**	**1943511.99**	**100**	
Cereals..... .	**1511078**	**394476.1**	**83.32**	**1770385.16**	**91.09**	
Teff..... .	128955	41305.08	8.72	53971.85	2.78	1.31
Barley..... .	367011	98584.11	20.82	207833.53	10.69	2.11
Wheat..... .	148997	47094.74	9.95	*	*	*
Maize..... .	1140488	179159.44	37.84	1127021.57	57.99	6.29
Sorghum..... .	102285	18154.39	3.83	*	*	*
Finger millet..... .	*	*	*	*	*	*
Oats/'Aja'..... .	59207	10053.23	2.12	*	*	*
Rice..... .	*	*	*	-	-	-
Pulses..... .	**730824**	**71121.17**	**15.02**	**162594.08**	**8.37**	
Faba beans..... .	14410	767.36	0.16	*	*	*
Field peas..... .	82258	16479.81	3.48	11984.48	0.62	*
Haricot beans..... .	642172	48720.28	10.29	142471.83	7.33	2.92
Chick-peas..... .	10509	1322.87	0.28	*	*	*
Lentils..... .	30788	3181.12	0.67	865.31	0.04	*
Grass Peas	*	*	*	*	*	*
Soya beans..... .	*	*	*	-	-	-
Fenugreek..... .	*	*	*	*	*	*
Gibto..... .	*	*	*	-	-	-
Oilseeds..... .	**42230**	**7863.79**	**1.66**	*****	*****	
Neug..... .	*	*	*	-	-	-
Linseed..... .	14902	5474.05	1.16	*	*	*
Groundnuts..... .	*	*	*	*	*	*
Sufflower..... .	*	*	*	-	-	-
Sesame..... .	*	*	*	-	-	-
Rapeseed..... .	16771	244.08	0.05	*	*	*

Table 8. Cropland Area, Production and Yield of Major Belg Crops For Private Peasant Holding For Belg Season 2004/05 (1997 E.C.)

Somale Region

Crop Name	Number Of Holders	Cropland Area In Hectares	%	Production In Quintals	%	Yield QT/HA
Grain Crops	**21308**	**11607.69**	**100**	**59580.27**	**100**	
Cereals..... .	**21031**	**11078.27**	**95.44**	**58233.81**	**97.74**	
Teff..... .	-	-	-	-	-	-
Barley..... .	*	*	*	*	*	*
Wheat..... .	*	*	*	*	*	*
Maize..... .	20622	10331	89	57129.66	95.89	5.53
Sorghum..... .	1710	476.32	4.1	232.48	0.39	*
Finger millet..... .	*	*	*	-	-	-
Oats/'Aja'..... .	-	-	-	-	-	-
Rice..... .	-	-	-	-	-	-
Pulses..... .	**3584**	**464.94**	**4.01**	*****	*****	
Faba beans..... .	-	-	-	-	-	-
Field peas..... .	-	-	-	-	-	-
Haricot beans..... .	3584	464.94	4.01	*	*	*
Chick-peas..... .	-	-	-	-	-	-
Lentils..... .	-	-	-	-	-	-
Grass Peas	-	-	-	-	-	-
Soya beans..... .	-	-	-	-	-	-
Fenugreek..... .	-	-	-	-	-	-
Gibto..... .	-	-	-	-	-	-
Oilseeds..... .	**323**	**64.48**	**0.56**	*****	*****	
Neug..... .	*	*	*	-	-	-
Linseed..... .	-	-	-	-	-	-
Groundnuts..... .	*	*	*	-	-	-
Sufflower..... .	-	-	-	-	-	-
Sesame..... .	*	*	*	*	*	*
Rapeseed..... .	-	-	-	-	-	-

Table 9. Cropland Area, Production and Yield of Major Belg Crops For Private peasant Holdings For Belg Season 2004/05 (1997 E.C.)

Benshangul-Gumuz Region

Crop Name	Number Of Holders	Cropland Area In Hectares	%	Production In Quintals	%	Yield QT/HA
Grain Crops	**10480**	**1161.05**	**100**	*****	*****	
Cereals..... .	**10278**	**800.29**	**68.93**	**776.97**	*****	
Teff..... .	-	-	-	-	*	-
Barley..... .	-	-	-	-	*	-
Wheat..... .	-	-	-	-	*	-
Maize..... .	10278	795.89	68.55	776.97	*	*
Sorghum..... .	*	*	*	-	*	-
Finger millet..... .	-	-	-	-	*	-
Oats/'Aja'..... .	-	-	-	-	*	-
Rice..... .	-	-	-	-	*	-
Pulses..... .	**9864**	**359.4**	**30.95**	*****	*****	
Faba beans..... .	-	-	-	-	*	-
Field peas..... .	-	-	-	-	*	-
Haricot beans..... .	9864	359.4	30.95	*	*	*
Chick-peas..... .	-	-	-	-	*	-
Lentils..... .	-	-	-	-	*	-
Grass Peas	-	-	-	-	*	-
Soya beans..... .	-	-	-	-	*	-
Fenugreek..... .	-	-	-	-	*	-
Gibto..... .	-	-	-	-	*	-
Oilseeds..... .	*****	*****	*****	-	*****	
Neug..... .	-	-	-	-	*	-
Linseed..... .	-	-	-	-	*	-
Groundnuts..... .	-	-	-	-	*	-
Sufflower..... .	-	-	-	-	*	-
Sesame..... .	-	-	-	-	*	-
Rapeseed..... .	*	*	*	-	*	-

Table 10. Cropland Area, Production and Yield of Major Belg Crops For Private Peasant Holdings For Belg Season 2004/05 (1997 E.C.)

(S.N.N.P.R) Region

Crop Name	Number Of Holders	Cropland Area In Hectares	%	Production In Quintals	%	Yield QT/HA
Grain Crops	**1627433**	**339344.21**	**100**	**4452419.82**	**100**	
Cereals..... .	**1519753**	**272524.45**	**80.31**	**4228890.03**	**94.98**	
Teff..... .	71104	17791.85	5.24	104336.61	2.34	5.86
Barley..... .	121972	13725.71	4.04	*	*	*
Wheat..... .	12300	1668.31	0.49	1843.65	0.04	1.11
Maize..... .	1443126	200991.04	59.23	*	*	*
Sorghum..... .	149425	36865.55	10.86	10969.66	0.25	*
Finger millet..... .	13460	1393.92	0.41	*	*	*
Oats/'Aja'..... .	*	*	*	-	-	-
Rice..... .	871	*	*	-	-	-
Pulses..... .	**1018483**	**65453.09**	**19.29**	**221447.73**	**4.97**	
Faba beans..... .	35409	1239.37	0.37	*	*	*
Field peas..... .	24754	1219.73	0.36	1865.73	0.04	1.53
Haricot beans..... .	1002304	62741.35	18.49	168559.98	3.79	2.69
Chick-peas..... .	1687	133.53	0.04	*	*	*
Lentils..... .	3700	70.33	0.02	47.19	-	*
Grass Peas	*	*	*	-	-	-
Soya beans..... .	*	*	*	-	-	-
Fenugreek..... .	1861	14.53	-	*	*	*
Gibto..... .	-	-	-	-	-	-
Oilseeds..... .	**32780**	**1366.67**	**0.4**	**2082.07**	**0.05**	
Neug..... .	-	-	-	-	-	-
Linseed..... .	2849	35.35	0.01	*	*	*
Groundnuts..... .	12836	*	*	*	*	*
Sufflower..... .	12311	309.19	0.09	*	*	*
Sesame..... .	2897	114.83	0.03	*	*	*
Rapeseed..... .	*	*	*	*	*	*

Table 11. Cropland Area, Production and Yield of Major Belg Crops For Private Peasant Holdings For Belg Season 2004/05 (1997 E.C.)

Harari Region

Crop Name	Number Of Holders	Cropland Area In Hectares	%	Production In Quintals	%	Yield QT/HA
Grain Crops	**2317**	**378.97**	**100**	*****	*****	
Cereals..... .	**2274**	**254.35**	**67.12**	*****	*****	
Teff..... .	-	-	-	-	*	-
Barley..... .	-	-	-	-	*	-
Wheat..... .	-	-	-	-	*	-
Maize..... .	1693	109.1	28.79	*	*	*
Sorghum..... .	1296	145.25	38.33	*	*	*
Finger millet..... .	-	-	-	-	*	-
Oats/'Aja'..... .	-	-	-	-	*	-
Rice..... .	-	-	-	-	*	-
Pulses..... .	**2089**	**89.49**	**23.61**	**28.38**	*****	
Faba beans..... .	-	-	-	-	*	-
Field peas..... .	-	-	-	-	*	-
Haricot beans..... .	2089	89.49	23.61	28.38	*	*
Chick-peas..... .	-	-	-	-	*	-
Lentils..... .	-	-	-	-	*	-
Grass Peas	-	-	-	-	*	-
Soya beans..... .	-	-	-	-	*	-
Fenugreek..... .	-	-	-	-	*	-
Gibto..... .	-	-	-	-	*	-
Oilseeds..... .	*****	*****	*****	-	*****	
Neug..... .	-	-	-	-	*	-
Linseed..... .	-	-	-	-	*	-
Groundnuts..... .	*	*	*	-	*	-
Sufflower..... .	-	-	-	-	*	-
Sesame..... .	-	-	-	-	*	-
Rapeseed..... .	-	-	-	-	*	-

Table 12. Cropland Area, Production and Yield of Major Belg Crops For Private Peasant Holdings For Belg Season 2004/05 (1997 E.C.)

Dire Da wa

Crop Name	Number Of Holders	Cropland Area In Hectares	%	Production In Quintals	%	Yield QT/HA
Grain Crops	**2987**	**153.72**	**100**	**246.85**	**100**	
Cereals..... .	**2987**	**150.86**	**98.14**	**192.24**	**77.88**	
Teff..... .	-	-	-	-	-	-
Barley..... .	-	-	-	-	-	-
Wheat..... .	-	-	-	-	-	-
Maize..... .	2455	112.39	73.11	143.59	58.17	1.28
Sorghum..... .	1054	38.36	24.95	48.65	19.71	1.27
Finger millet..... .	-	-	-	-	-	-
Oats/'Aja'..... .	-	-	-	-	-	-
Rice..... .	*	*	*	-	-	-
Pulses..... .	**168**	**2.86**	**1.86**	*****	*****	
Faba beans..... .	-	-	-	-	-	-
Field peas..... .	-	-	-	-	-	-
Haricot beans..... .	168	2.86	1.86	*	*	*
Chick-peas..... .	-	-	-	-	-	-
Lentils..... .	-	-	-	-	-	-
Grass Peas	-	-	-	-	-	-
Soya beans..... .	-	-	-	-	-	-
Fenugreek..... .	-	-	-	-	-	-
Gibto..... .	-	-	-	-	-	-
Oilseeds..... .	**-**	**-**	**-**	**-**	**-**	
Neug..... .	-	-	-	-	-	-
Linseed..... .	-	-	-	-	-	-
Groundnuts..... .	-	-	-	-	-	-
Sufflower..... .	-	-	-	-	-	-
Sesame..... .	-	-	-	-	-	-
Rapeseed..... .	-	-	-	-	-	-

APPENDIX I Estimation Procedures of Totals, Ratios and Sampling Errors

The following formulas were used to estimate total area of land under specific crop, production and yield of specific crop in a stratum.

1. For Estimating Total Area of Land Under Specific Crop:

$$\hat{A}_h = \sum_{i=1}^{n_h} W_{hi} \sum_{j=1}^{h_{hi}} a_{hij} = \sum_{i=1}^{n_h} W_{hi} a_{hi}$$

in which, $W_{hi} = \frac{M_h H_{hi}}{n_h m_{hi} h_{hi}}$ is the basic weight.

Where:

h represents the stratum

n_h is the total number of sample EAs successfully covered in the hth stratum.

M_h is the measure of size of the hth stratum as obtained from the sampling frame.

m_{hi} is the measure of size of the ith sample EA in the hth stratum obtained from the sampling frame.

H_{hi} is the total number of agricultural households of the ith sample EA in the hth stratum.

h_{hi} is the number of sample agricultural households successfully covered in the ith sample EA in the hth stratum.

a_{hij} is the value of area for agricultural households j, in the ith EA in the hth strtatum under a specific crop.

a_{hi} is the sample total area under specific crop for EA i in stratum h

$\hat{A}_h$ estimate of total area under specific crop in stratum h

2. For Estimating Total Production Under Specific Crop:

$$\hat{\mathrm{P}}_h = \sum_{i=1}^{n_h} W_{hi} \mathrm{P}_{hi}$$

in which, $\mathrm{P}_{hi} = a_{hi} * \bar{Y}_{hi}$

Where, $\bar{Y}_{hi} = \frac{Y_{hi}}{16C_{hi}}$ is average yield per square meter of a specific crop in the i[th] EA in the h[th] stratum.

$\hat{P}_h$ is estimate of total quantity of production of a specific crop in the h[th] stratum.

Y_{hi} is sample total quantity of production of a specific crop from defined area of land for crop cutting of a crop in the i[th] EA in the h[th] stratum.

P_{hi} is estimate of total quantity of production under specific crop for EA i in stratum h.

C_{hi} is the number of crop cutting of a specific crop in the i[th] EA in the h[th] stratum.

3. For Estimating Yield of a Specific Crop in Stratum h:

$$\hat{Y}_h = \frac{\hat{P}_h}{\hat{A}_h}$$

4. Sampling Variance of Estimates:

Sampling variance for the estimate of stratum total of area, production and yield for a specific crop are estimated by the following formulas.

$$Var(\hat{A}_h) = (1 - f_h)\frac{n_h}{n_h - 1}\sum_{i=1}^{n_h}\left(\hat{A}_{hi} - \frac{\hat{A}_h}{n_h}\right)^2 + f_h\sum_{i=1}^{n_h}(1 - f_{hi})\left(\frac{h_{hi}}{h_{hi} - 1}\right)\sum_{j=1}^{h_{hi}}\left(\hat{A}_{hij} - \frac{\hat{A}_{hi}}{h_{hi}}\right)^2$$

$$Var(\hat{P}_h) = (1 - f_h)\frac{n_h}{n_h - 1}\sum_{i=1}^{n_h}\left(\hat{P}_{hi} - \frac{\hat{P}_h}{n_h}\right)^2 + f_h\sum_{i=1}^{n_h}(1 - f_{hi})\left(\frac{h_{hi}}{h_{hi} - 1}\right)\sum_{j=1}^{h_{hi}}\left(\hat{P}_{hij} - \frac{\hat{P}_{hi}}{h_{hi}}\right)^2$$

$$Var(\hat{Y}_h) = \frac{1}{\hat{A}_h^{\,2}}\left[Var(\hat{P}_h) + \hat{Y}_h^{\,2}Var(\hat{A}_h) - 2\hat{Y}_h Cov(\hat{P}_h, \hat{A}_h)\right]$$

Where,

$$Cov(\hat{P}_h, \hat{A}_h) = (1 - f_h)\frac{n_h}{n_h - 1}\sum_{i=1}^{n_h}\left(\hat{A}_{hi} - \frac{\hat{A}_h}{n_h}\right)\left(\hat{P}_{hi} - \frac{\hat{P}_h}{n_h}\right) + f_h\sum_{i=1}^{n_h}(1 - f_{hi})\left(\frac{h_{hi}}{h_{hi} - 1}\right)\sum_{j=1}^{h_{hi}}\left(\hat{A}_{hij} - \frac{\hat{A}_{hi}}{h_{hi}}\right)\left(\hat{P}_{hij} - \frac{\hat{P}_{hi}}{h_{hi}}\right)$$

f_h = average first stage probability of selection of EAs within stratum *h*.

$f_{hi} = \frac{h_{hi}}{H_{hi}}$ = average second stage probability of selection within the *i*[th] sample EA in stratum *h*.

$\hat{A}_{hi}, \hat{P}_{hi}$ are weighted total area and production, respectively, of a specific crop in the i^{th} EA and h^{th} stratum.

$\hat{A}_{hij}, \hat{P}_{hij}$ are weighted values of area and production, respectively, from j^{th} agricultural household in the i^{th} EA and h^{th} stratum under a specific crop.

Since all strata are independent, the total variance at regional and country level is computed by aggregating the result obtained at Zone/Special Wereda level, i.e.

$$Var(\hat{A}) = \sum_{h}^{L} Var(\hat{A}_h), Var(\hat{P}) = \sum_{h}^{L} Var(\hat{P}_h) and Var(\hat{Y}) = \sum_{h}^{L} (\hat{Y}_h)$$

Where, *L* is the number of strata (Zone/Special Wereda).

In estimating the sampling variance by the above formula, selection of EAs within a stratum is assumed to be with replacement. By so doing the variance estimate may be slightly over estimated but it greatly simplifies the estimation procedure.

5. Coefficient of Variation (CV) of Estimates:

Coefficient of Variation (CV) in percentage of estimate of stratum total of area, production and yield for a specific crop are given by:

$$CV(\hat{A}_h) = \frac{\sqrt{Var(\hat{A}_h)}}{\hat{A}_h} * 100, CV(\hat{P}_h) = \frac{\sqrt{Var(\hat{P}_h)}}{\hat{P}_h} * 100, CV(\hat{Y}_h) = \frac{\sqrt{Var(\hat{Y}_h)}}{\hat{Y}_h} * 100$$

6. Ninety-Five Percent Confidence Interval (CI) of Stratum Total of Area:

$$\hat{A}_h \pm 1.96 * SE(\hat{A}_h),$$

Where $SE(\hat{A}_h) = \sqrt{Var(\hat{A}_h)}$ is standard error of the estimate of the stratum total of area.

Estimates of standard error and confidence interval for the other estimates can also be calculated by adopting the above formulas.

APPENDIX II Standard Errors and Coefficient of variations for the Estimates of Number of Holders, Area and Production of Major Crops, 2004/5 (1997 E.C) Agricultural Sample Survey, Belg Season

Table 1 Estimates for National

Crop	Holder				Area				Production			
	Estimate	S.E.	C.V	In %	Hectares	S.E.	C.V	In %	Quintals	S.E.	C.V	In %
TOTAL	3851848	88249.29		2.29	982796.71	42587.87		4.33	6670904.8	2097382.19		31.44
Cereals.....	3572691	86328.71		2.42	796488.33	36613.88		4.6	6236551.91	2083857.73		33.41
Teff.....	362475	32498.18		8.97	97886.21	11340.69		11.59	221650.36	56425.80		25.46
Barley.....	694823	50919.46		7.33	159348.43	19114.6		12	474695.07	142690.20		30.06
Wheat.....	235925	27775.45		11.77	59257.03	10854.9		18.32	386925.71	297671.30		76.93
Maize.....	2797535	74343.99		2.66	408649.24	18931.61		4.63	5121519.46	2064601.61		40.31
Sorghum.....	267219	22723.21		8.5	57843.09	7438.63		12.86	19567.5	4339.93		22.18
Finger millet.....	16324	2964.65		18.16	1620.43	336.3		20.75	868.67	414.42		47.71
Oats/'Aja'.....	81064	14253.7		17.58	11783.62	3010.99		25.55	11321.32	5552.40		49.04
Rice.....	1596	602.62		37.76	100.28	65.93		65.74	3.82	3.80		99.46
Pulses.....	1943395	64494.04		3.32	176635.93	13020.86		7.37	421409.73	56649.80		13.44
Horse.beans.....	52175	9475.11		18.16	2158.45	433		20.06	57289.87	33187.23		57.93
Field.peas.....	138959	20387		14.67	20681.55	4188.94		20.25	16186.02	3879.04		23.97
Haricot beans.....	1719178	58121.27		3.38	125384.75	10388.36		8.29	327047.18	43934.33		13.43
Chick-peas.....	88421	17911.7		20.26	13508.45	2938.85		21.76	12628.06	4403.55		34.87
Lentils.....	95980	18833.27		19.62	12290.08	3399.43		27.66	5575.65	1534.91		27.53
Vetch.....	25234	9884.36		39.17	1805.61	953.64		52.82	2221.93	1351.95		60.85
Soya beans.....	532	336.32		63.19	25.07	16.03		63.95	-	-		-
Fenugreek.....	12387	3143.49		25.38	763.2	466.19		61.08	461.02	209.39		45.42
Gibto.....	340	337.24		99.13	18.78	18.62		99.13	-	-		-
Oilseeds.....	83828	13783.71		16.44	9672.45	3239.95		33.5	12943.16	9805.53		75.76
Neug.....	1409	723.44		51.34	144.11	96.2		66.75	12.83	12.81		99.86
Linseed.....	22307	6604.42		29.61	5767.79	2736.03		47.44	10343.85	9747.94		94.24
Groundnuts.....	21176	8168.71		38.57	2663.55	1691.4		63.5	1317.16	913.36		69.34
Sufflower.....	13001	3126.86		24.05	311.56	95.88		30.78	890.26	528.93		59.41
Sesame.....	4917	1839.63		37.41	449.35	281.82		62.72	7.77	5.07		65.29
Rapeseed.....	23283	8325.84		35.76	336.1	123.83		36.84	371.29	187.48		50.49

Table 2 Estimates for Tigray Region

Crop	Holder				Area				Production			
	Estimate	S.E.	C.V	In %	Hectares	S.E.	C.V	In %	Quintals	S.E.	C.V	In %
TOTAL	69849	13859.48		19.84	22555.6	7830.5		34.72	33361.12	9332.75		27.97
Cereals.....	67755	13889.58		20.5	22195.98	7831.7		35.28	32849.43	9321.11		28.38
Teff.....	26982	10518.23		38.98	14884.82	6303.47		42.35	13128.52	5164.35		39.34
Barley.....	14261	3868.05		27.12	1302	394.67		30.31	1913.11	670.17		35.03
Wheat.....	3947	2132.59		54.04	645.56	358.57		55.54	505.7	303.32		59.98
Maize.....	31341	7847.42		25.04	4342.25	1612.07		37.13	16176.17	6984.26		43.18
Sorghum.....	2688	1599.39		59.5	980.27	595.71		60.77	907.51	620.41		68.36
Finger millet.....	732	551.04		75.25	41.07	30.91		75.25	218.42	217.63		99.64
Oats/'Aja'.....	-	-		-	-	-		-	-	-		-
Rice.....	-	-		-	-	-		-	-	-		-
Pulses.....	3811	1663.17		43.64	328.51	143.08		43.55	488.74	229.17		46.89
Horse.beans.....	403	395.54		98.2	17.57	17.27		98.27	10.74	10.61		98.75
Field.peas.....	1926	1354.45		70.33	140.24	99.49		70.94	73.85	72.50		98.17
Haricot beans.....	-	-		-	-	-		-	-	-		-
Chick-peas.....	673	469.97		69.86	91.87	64.01		69.67	157.51	124.08		78.78
Lentils.....	754	629.1		83.44	59.27	48.88		82.48	67.8	62.05		91.51
Vetch.....	-	-		-	-	-		-	-	-		-
Soya beans.....	-	-		-	-	-		-	-	-		-
Fenugreek.....	1214	618.95		50.99	19.56	11.89		60.78	178.84	164.25		91.84
Gibto.....	-	-		-	-	-		-	-	-		-
Oilseeds.....	820	507.22		61.89	31.11	30.02		96.5	22.96	22.72		98.99
Neug.....	-	-		-	-	-		-	-	-		-
Linseed.....	430	422.68		98.2	30.56	30.02		98.22	22.96	22.72		98.99
Groundnuts.....	-	-		-	-	-		-	-	-		-
Sufflower.....	160	161.77		100.85	0.25	0.26		100.85	-	-		-
Sesame.....	-	-		-	-	-		-	-	-		-
Rapeseed.....	229	229		100.09	0.29	0.29		100.09	-	-		-

Table 3 Estimates for Afar Region

Crop	Holder				Area				Production			
	Estimate	S.E.	C.V	In %	Hectares	S.E.	C.V	In %	Quintals	S.E.	C.V	In %
TOTAL	2799	1003.11		35.83	1226.14	555.98		45.34	291.88	214.08		73.34
Cereals.....	2799	1003.11		35.83	1144.12	538.74		47.09	286.08	212.62		74.32
Teff.....	1633	699.17		42.82	370.52	159.71		43.11	276.74	212.83		76.91
Barley.....	-	-		-	-	-		-	-	-		-
Wheat.....	-	-		-	-	-		-	-	-		-
Maize.....	1167	790.94		67.8	773.6	530.1		68.52	9.34	7.77		83.15
Sorghum.....	-	-		-	-	-		-	-	-		-
Finger millet.....	-	-		-	-	-		-	-	-		-
Oats/'Aja'.....	-	-		-	-	-		-	-	-		-
Rice.....	-	-		-	-	-		-	-	-		-
Pulses.....	417	189.53		45.43	68.66	31.69		46.15	5.81	3.03		52.18
Horse.beans.....	-	-		-	-	-		-	-	-		-
Field.peas.....	-	-		-	-	-		-	-	-		-
Haricot beans.....	158	81.02		51.14	18.21	9.66		53.05	5.81	3.03		52.18
Chick-peas.....	259	122.55		47.37	50.45	23.44		46.46	-	-		-
Lentils.....	-	-		-	-	-		-	-	-		-
Vetch.....	-	-		-	-	-		-	-	-		-
Soya beans.....	-	-		-	-	-		-	-	-		-
Fenugreek.....	-	-		-	-	-		-	-	-		-
Gibto.....	-	-		-	-	-		-	-	-		-
Oilseeds.....	47	44.07		94.37	13.36	12.61		94.37	-	-		-
Neug.....	-	-		-	-	-		-	-	-		-
Linseed.....	-	-		-	-	-		-	-	-		-
Groundnuts.....	-	-		-	-	-		-	-	-		-
Sufflower.....	-	-		-	-	-		-	-	-		-
Sesame.....	47	44.07		94.37	13.36	12.61		94.37	-	-		-
Rapeseed.....	-	-		-	-	-		-	-	-		-

Table 4 Estimates for Amhara Region

Crop	Holder				Area				Production			
	Estimate	S.E.	C.V	In %	Hectares	S.E.	C.V	In %	Quintals	S.E.	C.V	In %
TOTAL	480290	41351.46		8.61	132908.26	18871.22		14.2	170438.61	29771.99		17.47
Cereals.....	434737	38883.56		8.94	93863.91	13424.55		14.3	144901.33	27913.43		19.26
Teff.....	133801	22442.73		16.77	23533.93	4828.8		20.52	49936.65	16330.10		32.7
Barley.....	191047	29941.23		15.67	45690.36	11009.11		24.1	56814.98	15839.10		27.88
Wheat.....	69093	16615.13		24.05	9623.8	3432.61		35.67	19152.33	8326.66		43.48
Maize.....	146366	19938.06		13.62	12034.51	2122.3		17.64	17021.36	3846.19		22.6
Sorghum.....	8678	6477.82		74.64	1178.56	984.36		83.52	46.5	39.67		85.31
Finger millet.....	396	314.71		79.41	77.39	54.52		70.45	12.59	9.99		79.35
Oats/'Aja'.....	20892	5756.04		27.55	1725.32	500		28.98	1913.1	736.11		38.48
Rice.....	191	189.89		99.46	0.02	0.02		99.46	3.82	3.80		99.46
Pulses.....	174155	25931.97		14.89	38747.81	9782.46		25.25	25234.96	6140.56		24.33
Horse.beans.....	1954	980.41		50.18	134.14	96.34		71.82	42.44	24.54		57.81
Field.peas.....	30021	9623.29		32.05	2841.77	980.24		34.49	2261.96	817.83		36.16
Haricot beans.....	58839	14654.09		24.91	12988.22	7630.52		58.75	4371.15	1952.00		44.66
Chick-peas.....	75293	17269.14		22.94	11909.73	2865.29		24.06	11543.93	4336.15		37.56
Lentils.....	60737	15865.81		26.12	8979.37	3221.84		35.88	4595.35	1488.72		32.4
Vetch.....	22642	9819.54		43.37	1689.99	951.43		56.3	2202.61	1351.86		61.38
Soya beans.....	-	-		-	-	-		-	-	-		-
Fenugreek.....	5304	1826.55		34.44	204.58	112.18		54.83	217.51	122.11		56.14
Gibto.....	-	-		-	-	-		-	-	-		-
Oilseeds.....	7348	2228.93		30.34	296.54	155.01		52.27	302.31	175.75		58.14
Neug.....	428	426.92		99.86	5.29	5.29		99.86	12.83	12.81		99.86
Linseed.....	4126	1703		41.28	227.82	151.21		66.37	30.42	15.05		49.47
Groundnuts.....	-	-		-	-	-		-	-	-		-
Sufflower.....	192	185.97		96.9	1.47	1.42		97.07	0.96	0.95		98.63
Sesame.....	-	-		-	-	-		-	-	-		-
Rapeseed.....	2602	1324.6		50.9	61.95	34.21		55.22	258.11	174.66		67.67

Table 5 Estimates for Oromia Region

Crop	Holder				Area				Production			
	Estimate	S.E.	C.V	In %	Hectares	S.E.	C.V	In %	Quintals	S.E.	C.V	In %
TOTAL	1634383	63692.1		3.9	473461.07	33719.48		7.12	1943511.99	473195.93		24.35
Cereals.....	1511078	62424.63		4.13	394476.1	29716.22		7.53	1770385.16	462115.81		26.1
Teff.....	128955	19194.61		14.88	41305.08	7682.6		18.6	53971.85	20664.88		38.29
Barley.....	367011	38405.3		10.46	98584.11	15412.8		15.63	207833.53	64072.17		30.83
Wheat.....	148997	21984.38		14.75	47094.74	10285.13		21.84	364785.6	297554.24		81.57
Maize.....	1140488	55530.89		4.87	179159.44	14118.37		7.88	1127021.57	335588.70		29.78
Sorghum.....	102285	18098.09		17.69	18154.39	5179.42		28.53	7344.34	3975.20		54.13
Finger millet.....	1724	1410.99		81.86	107.95	101.62		94.14	20.06	20.16		100.54
Oats/'Aja'.....	59207	13030.81		22.01	10053.23	2969.19		29.53	9408.22	5503.38		58.5
Rice.....	509	371.3		72.97	17.16	17.15		99.96	-	-		-
Pulses.....	730824	46073.57		6.3	71121.17	7919.2		11.13	162594.08	34691.72		21.34
Horse.beans.....	14410	5833.35		40.48	767.36	339.44		44.23	6350.39	3499.09		55.10
Field.peas.....	82258	17243.67		20.96	16479.81	4060.88		24.64	11984.48	3741.20		31.22
Haricot beans.....	642172	42470.62		6.61	48720.28	6265.07		12.86	142471.83	33839.39		23.75
Chick-peas.....	10509	4704.84		44.77	1322.87	648.68		49.04	839.65	755.94		90.03
Lentils.....	30788	10077.33		32.73	3181.12	1083.13		34.05	865.31	367.92		42.52
Vetch.....	1817	1044.76		57.5	99.53	64.04		64.34	19.32	14.72		76.19
Soya beans.....	302	300.92		99.7	6.9	6.88		99.7	-	-		-
Fenugreek.....	4008	2397.69		59.82	524.53	452.31		86.23	63.11	44.22		70.06
Gibto.....	340	337.24		99.13	18.78	18.62		99.13	-	-		-
Oilseeds.....	42230	11585		27.43	7863.79	3189.45		40.56	10532.75	9749.11		92.56
Neug.....	898	578.23		64.4	119.95	94.22		78.55	-	-		-
Linseed.....	14902	6315.44		42.38	5474.05	2731.66		49.9	10261.01	9747.87		95
Groundnuts.....	8073	5658.74		70.1	1738.9	1605.48		92.33	202.23	145.43		71.91
Sufflower.....	338	336.26		99.54	0.65	0.64		99.54	-	-		-
Sesame.....	1814	1527.91		84.25	286.16	276.78		96.72	-	-		-
Rapeseed.....	16771	7811.9		46.58	244.08	117.25		48.04	69.51	56.76		81.65

Table 6 Estimates for Somali Region

Crop	Holder				Area				Production			
	Estimate	S.E.	C.V	In %	Hectares	S.E.	C.V	In %	Quintals	S.E.	C.V	In %
TOTAL	21308	4046.02		18.99	11607.69	3114.95		26.84	59580.27	23575.02		39.57
Cereals.....	21031	4022.87		19.13	11078.27	3054.52		27.57	58233.81	23519.35		40.39
Teff.....	-	-		-	-	-		-	-	-		-
Barley.....	532	296.21		55.65	46.25	23.98		51.86	233.24	199.14		85.38
Wheat.....	1588	817.57		51.47	224.61	163.18		72.65	638.43	392.12		61.42
Maize.....	20622	4006.16		19.43	10331	2889.67		27.97	57129.66	23039.15		40.33
Sorghum.....	1710	433.07		25.33	476.32	168.56		35.39	232.48	98.10		42.2
Finger millet.....	12	11.45		95.73	0.1	0.1		95.73	-	-		-
Oats/'Aja'.....	-	-		-	-	-		-	-	-		-
Rice.....	-	-		-	-	-		-	-	-		-
Pulses.....	3584	884.63		24.68	464.94	174.42		37.51	1343.38	1184.06		88.14
Horse.beans.....	-	-		-	-	-		-	-	-		-
Field.peas.....	-	-		-	-	-		-	-	-		-
Haricot beans.....	3584	884.63		24.68	464.94	174.42		37.51	1343.38	1184.06		88.14
Chick-peas.....	-	-		-	-	-		-	-	-		-
Lentils.....	-	-		-	-	-		-	-	-		-
Vetch.....	-	-		-	-	-		-	-	-		-
Soya beans.....	-	-		-	-	-		-	-	-		-
Fenugreek.....	-	-		-	-	-		-	-	-		-
Gibto.....	-	-		-	-	-		-	-	-		-
Oilseeds.....	323	145.49		45.08	64.48	28.11		43.6	3.08	2.15		69.72
Neug.....	84	82.24		98.36	18.86	18.65		98.89	-	-		-
Linseed.....	-	-		-	-	-		-	-	-		-
Groundnuts.....	79	79.47		100.98	10.63	10.77		101.36	-	-		-
Sufflower.....	-	-		-	-	-		-	-	-		-
Sesame.....	160	102		63.59	34.99	20.35		58.15	3.08	2.15		69.72
Rapeseed.....	-	-		-	-	-		-	-	-		-

Table 7 Estimates for Benshangul-Gumuz Region

Crop	Holder				Area				Production			
	Estimate	S.E.	C.V	In %	Hectares	S.E.	C.V	In %	Quintals	S.E.	C.V	In %
TOTAL	10480	2871.46	27.4		1161.05	352.96	30.4		11004.62	6248.12	56.78	
Cereals.....	10278	2827.27	27.51		800.29	249.53	31.18		792.58	385.71	48.67	
Teff.....	-	-	-		-	-	-		-	-	-	
Barley.....	-	-	-		-	-	-		-	-	-	
Wheat.....	-	-	-		-	-	-		-	-	-	
Maize.....	10278	2827.27	27.51		795.89	247.32	31.07		792.58	385.71	48.67	
Sorghum.....	84	83.58	99.74		4.4	4.38	99.74		-	-	-	
Finger millet.....	-	-	-		-	-	-		-	-	-	
Oats/'Aja'.....	-	-	-		-	-	-		-	-	-	
Rice.....	-	-	-		-	-	-		-	-	-	
Pulses.....	9864	2858.62	28.98		359.4	112.07	31.18		10212.04	6251.70	61.22	
Horse.beans.....	-	-	-		-	-	-		-	-	-	
Field.peas.....	-	-	-		-	-	-		-	-	-	
Haricot beans.....	9864	2858.62	28.98		359.4	112.07	31.18		10212.04	6251.70	61.22	
Chick-peas.....	-	-	-		-	-	-		-	-	-	
Lentils.....	-	-	-		-	-	-		-	-	-	
Vetch.....	-	-	-		-	-	-		-	-	-	
Soya beans.....	-	-	-		-	-	-		-	-	-	
Fenugreek.....	-	-	-		-	-	-		-	-	-	
Gibto.....	-	-	-		-	-	-		-	-	-	
Oilseeds.....	93	92.75	99.46		1.36	1.36	99.46		-	-	-	
Neug.....	-	-	-		-	-	-		-	-	-	
Linseed.....	-	-	-		-	-	-		-	-	-	
Groundnuts.....	-	-	-		-	-	-		-	-	-	
Sufflower.....	-	-	-		-	-	-		-	-	-	
Sesame.....	-	-	-		-	-	-		-	-	-	
Rapeseed.....	93	92.75	99.46		1.36	1.36	99.46		-	-	-	

Table 8 Estimates for SNNP Region

Crop	Holder				Area				Production			
	Estimate	S.E.	C.V	In %	Hectares	S.E.	C.V	In %	Quintals	S.E.	C.V	In %
TOTAL	1627433	42461.5	2.61		339344.21	15783.94	4.65		4452419.82	2042921.76	45.88	
Cereals.....	1519753	42721.81	2.81		272524.45	14362.41	5.27		4228890.03	2031623.15	48.04	
Teff.....	71104	8538.19	12.01		17791.85	2551.92	14.34		104336.61	49633.11	47.57	
Barley.....	121972	14363.08	11.78		13725.71	2540.96	18.51		207900.21	126506.46	60.85	
Wheat.....	12300	2623.71	21.33		1668.31	326.95	19.6		1843.65	322.31	17.48	
Maize.....	1443126	44261.04	3.07		200991.04	11969.97	5.96		3903222.29	2036999.14	52.19	
Sorghum.....	149425	11994.88	8.03		36865.55	5210.7	14.13		10969.66	1623.59	14.8	
Finger millet.....	13460	2528.92	18.79		1393.92	314.39	22.55		617.61	351.95	56.99	
Oats/'Aja'.....	965	483.79	50.14		5.06	2.63	51.95		-	-	-	
Rice.....	871	434.1	49.84		83	63.66	76.7		-	-	-	
Pulses.....	1018483	36772.52	3.61		65453.09	3326.79	5.08		221447.73	43902.60	19.83	
Horse.beans.....	35409	7391.35	20.87		1239.37	250.38	20.2		50886.29	33002.24	64.85	
Field.peas.....	24754	4883	19.73		1219.73	292.69	24		1865.73	613.41	32.88	
Haricot beans.....	1002304	36747.23	3.67		62741.35	3224.65	5.14		168559.98	27218.06	16.15	
Chick-peas.....	1687	484.45	28.72		133.53	38.77	29.04		86.98	46.33	53.26	
Lentils.....	3700	1009.78	27.29		70.33	16.71	23.77		47.19	21.42	45.4	
Vetch.....	775	430.93	55.64		16.09	10.42	64.79		-	-	-	
Soya beans.....	230	150.2	65.18		18.17	14.48	79.69		-	-	-	
Fenugreek.....	1861	642.84	34.54		14.53	4.84	33.3		1.56	0.87	55.51	
Gibto.....	-	-	-		-	-	-		-	-	-	
Oilseeds.....	32780	7106.37	21.68		1366.67	545.84	39.94		2082.07	1035.28	49.72	
Neug.....	-	-	-		-	-	-		-	-	-	
Linseed.....	2849	809.09	28.39		35.35	12.09	34.21		29.47	24.15	81.93	
Groundnuts.....	12836	5888.93	45.88		878.89	531.32	60.45		1114.93	901.71	80.88	
Sufflower.....	12311	3098.94	25.17		309.19	95.87	31.01		889.3	528.93	59.48	
Sesame.....	2897	1018.51	35.16		114.83	47.4	41.28		4.69	4.60	97.97	
Rapeseed.....	3587	2545.23	70.95		28.41	20.33	71.57		43.67	37.73	86.4	

Table 9 Estimates for Harari Region

Crop	Holder				Area				Production			
	Estimate	S.E.	C.V	In %	Hectares	S.E.	C.V	In %	Quintals	S.E.	C.V	In %
TOTAL	2317	525.47	22.68		378.97	115.07	30.36		49.64	24.99	50.34	
Cereals.....	2274	524.64	23.07		254.35	73.06	28.72		21.26	17.4	81.8	
Teff.....	-	-	-		-	-	-		-	-	-	
Barley.....	-	-	-		-	-	-		-	-	-	
Wheat.....	-	-	-		-	-	-		-	-	-	
Maize.....	1693	414.19	24.46		109.1	30.38	27.84		2.89	1.92	66.47	
Sorghum.....	1296	380.41	29.35		145.25	55.44	38.17		18.37	17.39	94.65	
Finger millet.....	-	-	-		-	-	-		-	-	-	
Oats/'Aja'.....	-	-	-		-	-	-		-	-	-	
Rice.....	-	-	-		-	-	-		-	-	-	
Pulses.....	2089	510.94	24.46		89.49	26.07	29.14		28.38	13.96	49.18	
Horse.beans.....	-	-	-		-	-	-		-	-	-	
Field.peas.....	-	-	-		-	-	-		-	-	-	
Haricot beans.....	2089	510.94	24.46		89.49	26.07	29.14		28.38	13.96	49.18	
Chick-peas.....	-	-	-		-	-	-		-	-	-	
Lentils.....	-	-	-		-	-	-		-	-	-	
Vetch.....	-	-	-		-	-	-		-	-	-	
Soya beans.....	-	-	-		-	-	-		-	-	-	
Fenugreek.....	-	-	-		-	-	-		-	-	-	
Gibto.....	-	-	-		-	-	-		-	-	-	
Oilseeds.....	188	143.99	76.48		35.14	29.21	83.14		-	-	-	
Neug.....	-	-	-		-	-	-		-	-	-	
Linseed.....	-	-	-		-	-	-		-	-	-	
Groundnuts.....	188	143.99	76.48		35.14	29.21	83.14		-	-	-	
Sufflower.....	-	-	-		-	-	-		-	-	-	
Sesame.....	-	-	-		-	-	-		-	-	-	
Rapeseed.....	-	-	-		-	-	-		-	-	-	

Table 10 Estimates for Dire Dawa Administrative Council

Crop	Holder				Area				Production			
	Estimate	S.E.	C.V	In %	Hectares	S.E.	C.V	In %	Quintals	S.E.	C.V	In %
TOTAL	2987	590.42	19.77		153.72	38.2	24.85		246.85	67.96	27.53	
Cereals.....	2987	590.42	19.77		150.86	37.81	25.06		192.24	52.35	27.23	
Teff.....	-	-	-		-	-	-		-	-	-	
Barley.....	-	-	-		-	-	-		-	-	-	
Wheat.....	-	-	-		-	-	-		-	-	-	
Maize.....	2455	600.96	24.48		112.39	34.08	30.32		143.59	45.87	31.94	
Sorghum.....	1054	258.01	24.48		38.36	11.62	30.28		48.65	19.79	40.69	
Finger millet.....	-	-	-		-	-	-		-	-	-	
Oats/'Aja'.....	-	-	-		-	-	-		-	-	-	
Rice.....	25	28.07	111.37		0.11	0.12	111.37		-	-	-	
Pulses.....	168	72.35	43.09		2.86	1.35	47.26		54.61	45.83	83.93	
Horse.beans.....	-	-	-		-	-	-		-	-	-	
Field.peas.....	-	-	-		-	-	-		-	-	-	
Haricot beans.....	168	72.35	43.09		2.86	1.35	47.26		54.61	45.83	83.93	
Chick-peas.....	-	-	-		-	-	-		-	-	-	
Lentils.....	-	-	-		-	-	-		-	-	-	
Vetch.....	-	-	-		-	-	-		-	-	-	
Soya beans.....	-	-	-		-	-	-		-	-	-	
Fenugreek.....	-	-	-		-	-	-		-	-	-	
Gibto.....	-	-	-		-	-	-		-	-	-	
Oilseeds.....	-	-	-		-	-	-		-	-	-	
Neug.....	-	-	-		-	-	-		-	-	-	
Linseed.....	-	-	-		-	-	-		-	-	-	
Groundnuts.....	-	-	-		-	-	-		-	-	-	
Sufflower.....	-	-	-		-	-	-		-	-	-	
Sesame.....	-	-	-		-	-	-		-	-	-	
Rapeseed.....	-	-	-		-	-	-		-	-	-	

Form CPSS 97/8B

Crop Production Sample Survey

List of Fields Under Mixed Crops (Including Vegetables and Root Crops) and Agricultural Practices (Belg Season) – 2004/05 (1997 E.C)

Part I – Identification Particulars

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Region	Zone	Wereda	Farmers' Assocation	Enumeration Area	House hold ID Number	Holder ID Number	Sex of head of House hold M = 1 F = 2	Holders Name	Age	Sex M = 1 F = 2	Educational Status	House hold Size	Type of Holding Crop = 1 Livestock = 2 Both = 3

Part II. Area Under Temporary Crops and Agricultural Practices and Area Measurement Result

1		2	3					4		5		
Sr. No.		Questions	Parcel No.		Field No.			Date of Measurement		Area in Sq. m.		
			Crop Name		Crop Name		Crop Name	Date	Month			
			code		cod		cod			**Closure Error**		
0	1	Type of Holding Private = 1 Rented/Contract= 2 Others						Side ID	1 - 2	2 - 3		3 -
0	2	Have the field been included in the extension package program Yes = 1 No= 2						Bearing				
0	3	Was the field irrigated ? Yes = 1 No = 2						Distances of				
0	4	Area in percentage share for each crop						Side ID	4 -	5 -		6 -
0	5	Varity of seeds used Improved = 1 Indigenous = 2						Bearing				
0	6	(For Cereals, Pulses and oil seeds only) If indigenous seed was used, What was the total Quantity	Kg	gram	Kg	gram	Kg gram	Distances of				
0	7	(For Cereals, Pulses and oil seeds only) If improved seed was used What was the total quantity	Kg	gram	Kg	gram	Kg gram	Side ID	7 -	8 -		9 -
0	8	(For Cereals, Pulses and oil seeds only) If improved seed was used What was the cost/price	Birr	cent.	Birr	cent.	Birr cent.	Bearing				
0	9	Was the crop damage Yes = 1 No = 2						Distances of				
1	0	If you, what was the major censes of damage Percentage of damage	Reason	code	Reason	code	Reason co	Side ID	10 -	11 -		12 -
1	1	Percentage of damage						Bearing				
1	2	Any control/prevention measure taken for crop damage? Yes = 1 No = 2						Distances of				
1	3	If Yes, What type of measure ? Chemical = 1 Both = 3 Non Chemical = 2						Side ID	13 -	14 -		15 -
1	4	If Chemical Insecticide = 1 1&3 = 5 Herbicides = 2 2&3 = 6 fungicide = 3 All = 7 1&2 = 4						Bearing				
1	5	What was field fertilized ? Yes = 1 No = 2						Distances of				
1	6	If fertilized What type ? Natural 1 Both = 3 Chemical = 2						Side ID	19 -	20 -		21 -
1	7	If chemical fertilizer used 17.1 Type Urea = 1 Both = 3						Bearing				
		17.2 Quantity in Kg.	Kg	gram				Distances of				
1	8	If Natural fertilizer used mainly what type ? Manure = 1 1 & 3 = 5 Compost = 2 2 & 3 = 6 Orga = 3 All = 7 1 & 2 = 4 Other						Side ID	22 -	23 -		24 -
								Bearing				
								Distances of				
								Reason if Area measurement not condacted →				
1	9	Production in local unit	Local unit	Code	quantity			Local unit	Code	quantity	Local unit	Code quantity

Form CPSS 97/8A

Crop Production Sample Survey

List of Fields Under Temporary Crops (Including Vegetables and Root Crops) and Agricultural Practices (Belg Season) – 2004/05 (1997 E.C)

Part I – Identification Particulars

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Region	Zone	Wereda	Farmers' Assocation	Enumeration Area	House hold ID Number	Holder ID Number	Sex of head of House hold M = 1 F = 2	Holder Name	Holder Age	Holder Sex M = 1 F = 2	Educational Status	House hold Size	Type of Holding Crop = 1 Livestock = 2 Both = 3

Part II. Area Under Temporary Crops and Agricultural Practices and Area Measurement Result

1		2	3			4		5	
Sr. No.		Questions	Parcel No.	Field No.	Crop Name	Date of Measurement		Area in Sq. m.	
						Date	Month		
0	1	Type of Holding Private = 1 Rented/Contract= 2 Ot						Closure Error	
0	2	Crop Production in local unit	Local unit	Code	quantity				
0	3	Have the field been included in the extension package program Yes = 1 No= 2				Side ID	1 - 2	2 - 3	3 -
0	4	Was the field irrigated ? Yes = 1 No = 2				Bearing			
0	5	Varity of seeds used Improved = 1 Indigenous = 2				Distances of			
0	6	(For Cereals, Pulses and oil seeds only) If indigenous seed was used, What was the total Quantity	Kg	gram		Side ID	4 -	5 -	6 -
0	7	(For Cereals, Pulses and oil seeds only) If improved seed was used What was the total quantity	Kg	gram		Bearing			
0	8	(For Cereals, Pulses and oil seeds only) If improved seed was used What was the cost/price	Birr	cent.		Distances of			
0	9	Was the crop damage Yes = 1 No = 2				Side ID	7 -	8 -	9 -
1	0	If you, what was the major censes of damage Percentage of damage	Reason		code	Bearing			
1	1	Percentage of damage				Distances of			
1	2	Any control/prevention measure taken for crop damage? Yes = 1 No = 2				Side ID	10 -	11 -	12 -
1	3	If Yes, What type of measure ? Chemical = 1 Both = 3 Non Chemical = 2				Bearing			
1	4	If Chemical Insecticide = 1 1&3 = 5 Herbicides = 2 2&3 = 6 fungicide = 3 All = 7 1&2 = 4				Distances of			
1	5	What was field fertilized ? Yes = 1 No = 2				Side ID	13 -	14 -	15 -
1	6	If fertilized What type ? Natural 1 Both = 3 Chemical = 2				Bearing			
1	7	If chemical fertilizer used 17.1 Type Urea = 1 Both = 3				Distances of			
		17.2 Quantity in Kg.	Kg	gram		Side ID	16 -	17 -	18 -
1	8	If Natural fertilizer used mainly what type ? Manure = 1 1 & 3 = 5 Compost = 2 2 & 3 = 6 Orga = 3 All = 7 1 & 2 = 4 Others (Specify) = 8				Bearing			
						Distances of			
						Side ID	19	20	21
						Bearing			
						Distances of			
						Side ID	22 -	23 -	24 -
						Bearing			
						Distances of			

Reason if Area measurement not conducted →