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, contribuites 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 formulation, planning and assessment of agricultural development. On the contrary, the absence and/or inadequate supply of primary input in the form of reliable statistical data will adversely affect the ability of planners and policy makers in the decision making process.

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 2003/04 (1996 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 2003/04

Belg season by private peasant holdings as obtained from the results of the year 2003/04 (1996 E.C) Belg season Crop Production Sample survey.

1.2 Objectives of the Survey

The objectives of the 2003/04 (1996 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
- 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 Scope and Coverage

The 2003/04 (1996 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.

To be covered by the survey, a total of 2,072 enumeration areas were selected initially, however, due to various reasons that are beyond the control of the CSA, totally 59 EA’s

(56 EA's in Gambella region and 3 EA's from other regions) were not covered and the survey was successfully carried out in 2,013 (97.15 %) EA's. As regards the ultimate sampling unit, it was planned to conduct the survey on 51,800 agricultural households, however, 49,803 (96.14 %) agricultural households were actually covered by the Belg season agricultural sample survey. Due to the reasons mentioned above, distribution of the number of sampling units (planned and covered) by reporting level is presented in Table 1 below.

Table 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	163	4100	4045
Afar	2	56	56	1400	1350
Amhara	10	396	395	9900	9806
Oromia	14	536	536	13400	13222
Somali	3	84	84	2100	2070
Benishangul-Gumuz	3	84	84	2100	2056
SNNP	21	624	623	15600	15477
Gambella	-	56	-	1400	-
Harari*	1	24	24	600	597
Addis Ababa*	1	24	24	600	582
Dire Dawa*	1	24	24	600	598
Total	**61**	**2072**	**2013**	**51800**	**49803**

**** = 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 2003/4 Agricultural Sample Survey was determined by taking into 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 was 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 was presented only at regional and country level.

Estimation procedures for totals and 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.

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 2003/04(1996 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 field work 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 2003/04 (1996E.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 2003/04 (1996 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 Verifcation

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 2003/04 (1996 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 FINDIGS THE SURVEY.

In this part of the report the estimates of total Belg cropland area and production of the 2003/04 (1996 E.C) Belg season are presented. The following are discussions on the major findings of the 2003/04 Belg season crop production survey .

According to the 2003/04 (1996 E.C) Belg season crop production sample survey results, it is estimated that major Belg crops covered about 897.42 thousand hectares of land and a total of 2704.84 thousand quintals of production was obtained at country level. Out of this total cropland area under Belg crops, the highest which is about 786.55 thousand hectares (87.65%) were under cereals followed by pulses that covered about 101.63 thousand hectares (11.32%), and about 9.24 thousand hectares (1.03%) were covered by oilseed crops.

From the above-mentioned total cropland area, an estimated production of about 2,652.02 thousand quintals (98.05%) and 48.83 thousand quintals (1.89%)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, 2003//04 (1996 E.C))

Crop Type	Total Area		Total Production	
	In thousands (ha.)	%	In thousands (Ql.)	%
Cereal	786.55	87.65	2652.02	98.05
Pulses	101.63	11.32	48.83	1.81
Oilseeds	9.24	1.03	*	*
All Crops	897.42	100.00	2704.84	100.00

3.1. General Over-view on the Performance of Crop Production Activities of the 2003/04 Belg Season as compared to the 2001/02(1994 E.C.).

In this section of the report an attempt is made to compare the performance of Belg seasons of the year 2001/02 (1994 E.C.) with that of the 2003/04 (1996E.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 the very poor performance of the 2003/04 (1996E.C.) Belg season crop production activities when compared to the 2001/02 (1994 E.C.) Belg season cropland area and production estimates. A very clear indicator for the poor performance of the 2003/04 Belg season crop production activities is that belg crops were grown on a total area of 897.42 thousand hectares which is 4.47% higher than the 2001/02 crop year, on the contrary the corresponding production of grain crops is 2,704.84 thousand quintals which is 38.06% lower than the grain production of the year 2001/02 Belg season. The decrease in production ranges from 93.72% for haricot Beans to 20.16% for Maize. A close evaluation of the performance of each Belg crop have indicated that except for sorghum that have shown a significant increase in crop production, i.e. 65.03% increase in crop area and 52.18% increase in production, all other crops have failed to show an increase in production irrespective of the increase in area.(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 eventhough the total area covered by Belg Season crops has shown a significant increase in the two year periods, i.e. from 2001/02 (1994 E.C) to 2003/04 (1996 E.C),the respective production has shown a tremendous decrease in volume.

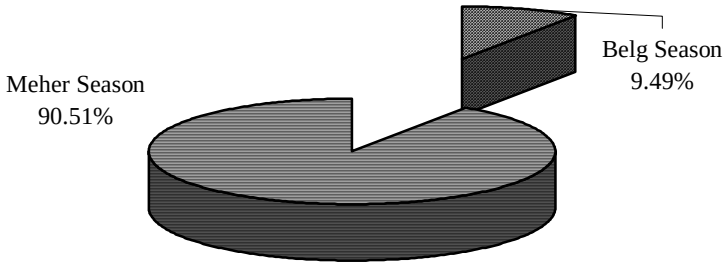
3.2 Results of 2003/04 (1996 E.C) Both Seasons (Meher and Belg)

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 2003/04 (1996 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 2003/04 (1996E.C) both seasons, was estimated to be 11.24 million hectares and 106.2 million quintals, respectively.

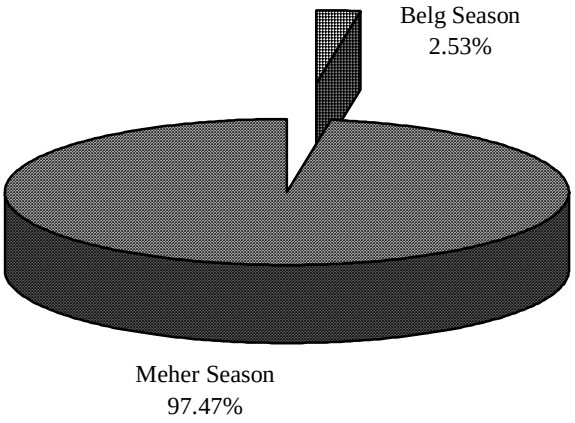
Out of the above mentioned totals, 0.90 (9.49%) million hectares and 2.7 (2.53%) million quintals was the contribution of Belg season. (For the details see Figs 1 and 2, and Summary Tables B and C).

Figure 1.Estimates of total area under major crops for private holdings in Ethiopia for both seasons 2003/04(1996 E.C.)



Out of the total output of major crops (both Meher and Belg Seasons) of 2003/04(1996 E.C.) the total area under Cereals accounted for about 9.46 million hectares(83%) with a production of 92.65 million quintals(87.24%).

Figure2. Estimates of total production of major crops for private holdings in Ethiopia for both seasons 2003/04 (1996 E.C)



About 1.2 million hectares (9%) with a production of 10.42 million quintals (9.81%) accounted for pulses, and 0.58 million hectares (8%) with a production of 3.13 million quintals (2.95%) 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, 2003/04 (1996 E.C.)

TYPE OF CROP	AREA IN MILLION HECTARES					
	MEHER	%	BELG	%	BOTH	%
CEREALS	6.99	80.72	0.79	87.65	9.46	83
PULSES	1.10	12.70	0.10	11.32	1.20	9
OILSEEDS	0.57	6.58	0.01	1.03	0.58	8
	8.66	100	0.90	100	11.24	100
TYPE OF CROP	PRODUCTION IN MILLION QUINTALS					
	MEHER	%	BELG	%	BOTH	%
CEREALS	90.00	86.96	2.65	98.05	92.65	87.24
PULSES	10.37	10.02	0.05	1.81	10.42	9.81
OILSEEDS	3.13	3.02	*	*	3.13	2.95

3.3 Comparison of 2001/02 and 2003/04 of Both Seasons (Meher andBelg)

Area and production of Major Crops

Comparison of the total area and production of 2001/02 (1994E.C.) and 2003/04 (1996E.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 Belg Season Crops for Private Peasant Holdings in Ethiopia, 2001/02 (1994 E.C.) and 2003/04 (1996 E.C.) Both Seasons

TYPE OF CROP	AREA IN MILLION HECTARES			PROD. IN MILLION QUINTALS		
	2001/02 (1994 E.C)	2003/04 (1996 E.C)	% age CHANGE	2001/02 (1994 E.C)	2003/04 (1996 E.C)	% age CHANGE
CEREALS	7.07	7.79	10.18	90.70	92.71	2.21
PULSES	1.17	1.20	2.56	10.93	10.42	-4.66
OILSEEDS	.43	.58	34.88	2.08	3.13	50.48
TOTAL	8.67	9.57	10.38	103.71?	106.26	2.46

Accordingly, the 2003/04 (1996 E.C) both seasons' total outputs of the major crops have increased by 10.38% in area, and by 2.46% in production as compared to the 2001/02(1994) results. But contrary to the fact that the 2003/04 (1996 E.C) total area for Major Belg Season crops increased by 5.88%, the production has decreased by 37.24% compared to the 2001/02 (1994) Belg Season.(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, 2001/02 (1994 E.C.) and 2003/04 (1996 E.C.) Belg Season

TYPE OF CROP	BELG SEASONS					
	AREA IN MILLION HECTARES			PRODUCTION IN MILLION QUINTALS		
	2001/02 (1994 E.C)	2003/04 (1996 E.C)	% age CHANGE	2001/02 (1994 E.C)	2003/04 (1996 E.C))	% age CHANGE
CEREALS	0.70	0.79	12.85	3.63	2.65	-26.99
PULSES	0.15	0.10	-33.33	0.72	0.05	-93.05
OILSEEDS	0.004	0.01	150	*	0.03	-
TOTAL	0.85	0.90	5.88	4.35	2.73	-37.24

Comparison of the total area and production of 2001/012 (1994E.C.) and 2003/04 (1996E.C) was made for Belg reporting regions, and is presented in Table 2.

When we compare nationally the general trend was an increase in area and a decrease in production. An independent observation of each region actually shows in Tigray and Oromiya Regions area and production for Belg Seasons have shown a significant increase. For the details see Table 2.

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 2001/02 (1994 E.C.) and 2003/04 (1996 E.C.) Area, Production and Yield of Major Belg Season Crops for Peasant Holdings in Ethiopia

Crop Type	Total Area ('000 Ha)			Total Production ('000 Qt)			Yield		
	2001/02 (1994 E.C.)	2003/04 (1996 E.C.)	% Change	2001/02 (1994 E.C.)	2003/04 (1996 E.C.)	% Change	2001/02 (1994 E.C.)	2003/04 (1996 E.C.)	% Change
Grain Crop	**856.1**	**897.42**	**4.83**	**4352.15**	**2704.83**	**-37.85**			
Cereals	**701.99**	**786.55**	**12.05**	**3613.45**	**2652.02**	**-26.61**			
Teff	47.09	7.54	-83.99	176.92	9.73	-94.50	3.76	1.29	-65.65
Barley	183.72	155.31	-15.46	474.82	76.87	-83.81	2.58	0.49	-80.85
Wheat	60.71	67.42	11.05	165.08	36.52	-77.88	2.72	0.54	-80.08
Maize	348.42	424	21.69	2501.85	2009.15	-19.69	7.18	4.74	-34.01
Sorghum	44.46	52.18	17.36	253.47	418.29	65.03	5.70	8.02	40.61
Finger Millet	1.27	*	*	*	*	*	*	*	*
Oats/'Aja'	13.55	11.8	-12.92	8732.12	*		644.44	*	*
Rice	*	*	*	*	*	*	*	*	*
Pulses	**151.01**	**101.63**	**-32.70**	**715.08**	**48.83**	**-93.17**			
Fabab Beans	2.52	1.45	-42.46	26.51	*		10.52		-100.00
Field Peas	2.8	17.2	514.29	69.79	*		24.93		-100.00
Haricot Beans	86.78	57.21	-34.07	525.47	33.04	-93.71	6.06	0.58	-90.46
Chick Peas	10.18	13.81	35.66	51.12	*	*	5.02	*	*
Lentils	15.31	5.74	-62.51	30.31	*	*	1.98	*	*
Grass Peas	1.46	3.9	167.12	*	*	*	*	*	*
Soya Bean	0.03	*		*	*	*	*	*	*
Fenugreek	4.91	1.57	-68.02	5.42	*		1.10	*	*
Gibto	0.01	*	*	*	*	*	*	*	*
Oilseeds	**4.09**	**9.24**	**125.92**	*****	*****	*****			
Neug	0.06	7.62	12600.00	*	*	*	*	*	*
Line Seed	3.48	*	*	*	*	*	*	*	*
Groundnuts	0.45	*	*	*	*	*	*	*	*
Sufflower	0.08	*	*	*	*	*	*	*	*
Sesame	0.03	*	*	*	*	*	*	*	*
Rapeseed	*	0.08	*	*	*	*	*	*	*

* Excluding Gambella Region

Table 2. Estimates of 2001/02(1994 E.C.) and 2003/04(1996 E.C.) Area and Production of Major Belg Season Crops for Peasant Holdings in Ethiopia, by Region

Region	Area under major crops ('000 Ha)			Production under major crops ('000 Qt)		
	2001/02 (1994 E.C.)	2003/04 (1996 E.C.)	% Change	2001/02 (1994 E.C.)	2003/04 (1996 E.C.)	% Change
Tigray	11.25	25	122.22	23.14	68.38	195.51
Afar	0.77	12.42		0.11	*	-
Amhara	158.59	103.12	-34.97	725.66	116.48	-83.94
Oromiya	417.28	468.19	12.20	1153.53	1757.49	52.35
Somali	7.87	12.84	63.15	5.94	2.36	-60.27
Benshangul-Gumz	0.48	0.82	70.83	1.97	*	-
S.N.N.P	258.63	285.98	10.57	2431.63	741	-69.53
Gambela	NA	NA	NA	NA	NA	NA
Harari	0.95	0.08	-90.52	*	*	-
Addis Ababa	*	-	-	*	-	-
Dire Dawa	0.26	0.15	-42.30	*	*	-
All Regions	**856.1**	**908.6**	**5.77**	**4352.2**	**2685.71**	**-38.50**

Table 3. Croplan Area, Production and Yield of Major Belg Crops For Private Holdings
For Belg Season 2003/04 (1996 E.C.)

Etiopia

Crop Name	Number Of Holders	Cropland Area In Hectares	%	Production In Quintals	%	Yield QT/HA
Grain Crops	3521476	897419	100	2704838	100	
Cereals..... .	3247003	786550	88	2652019	98	
Teff..... .	272410	73535	8	97311	4	1
Barley..... .	633949	155305	17	76874	3	0
Wheat..... .	256165	67420	8	36515	1	1
Maize..... .	2509861	424001	47	2009152	74	5
Sorghum..... .	174034	52176	6	418288	15	8
Finger millet..... .	9569	*	*	*	*	*
Oats/'Aja'..... .	71520	11797	1	*	*	*
Rice..... .	3006	*	*	*	*	*
Pulses..... .	901422	101627	11	48834	2	
Faba Beans	32120	1467	0	*	*	*
Field peas..... .	115779	17202	2	*	*	*
Haricot beans..... .	664840	57211	6	33041	1	1
Chick-peas..... .	79203	13808	2	*	*	*
Lentils..... .	57440	5744	1	*	*	*
Grass Peas	26985	3897	0	*	*	*
Soya beans..... .	*	*	*	-	-	-
Fenugreek..... .	16378	1586	0	*	*	*
Gibto..... .	*	*	*	*	*	*
Oilseeds..... .	41952	9242	1	*	*	
Neug..... .	*	*	*	*	*	*
Linseed..... .	25469	7620	1	*	*	*
Groundnuts..... .	9029	*	*	*	*	*
Sufflower..... .	-	-	-	-	-	-
Sesame..... .	*	*	*	*	*	*
Rapeseed..... .	5067	77	-	*	*	*

Table 4. Croplan Area, Production and Yield of Major Belg Crops For Private Holdings
For Belg Season 2003/04 (1996 E.C.)

Tigray Region

Crop Name	Number Of Holders	Cropland Area In Hectares	%	Production In Quintals	%	Yield QT/HA
Grain Crops	62915	25002	100	68376	100	
Cereals..... .	58807	23380	94	67582	99	
Teff..... .	17398	*	*	53809	79	*
Barley..... .	14089	2214	9	*	*	*
Wheat..... .	*	*	*	*	*	*
Maize..... .	29293	4270	17	6258	9	1
Sorghum..... .	*	*	*	*	*	*
Finger millet..... .	1925	1	-	-	-	-
Oats/'Aja'..... .	-	-	-	-	-	-
Rice..... .	-	-	-	-	-	-
Pulses..... .	7776	1622	6	*	*	
Faba Beans	*	*	*	*	*	*
Field peas..... .	*	*	*	*	*	*
Haricot beans..... .	-	-	-	-	-	-
Chick-peas..... .	3503	*	*	6	-	*
Lentils..... .	*	*	*	*	*	*
Grass Peas	*	*	*	*	*	*
Soya beans..... .	-	-	-	-	-	-
Fenugreek..... .	1078	29	0	-	-	-
Gibto..... .	-	-	-	-	-	-
Oilseeds..... .	-	-	-	-	-	
Neug..... .	-	-	-	-	-	-
Linseed..... .	-	-	-	-	-	-
Groundnuts..... .	-	-	-	-	-	-
Sufflower..... .	-	-	-	-	-	-
Sesame..... .	-	-	-	-	-	-
Rapeseed..... .	-	-	-	-	-	-

Table 5. Croplan Area, Production and Yield of Major Belg Crops For Private Holdings
For Belg Season 2003/04 (1996 E.C.)

Afar Region

Crop Name	Number Of Holders	Cropland Area In Hectares	%	Production In Quintals	%	Yield QT/HA
Grain Crops	2670	1243	100	*	*	
Cereals..... .	2572	1081	87	0	*	
Teff..... .	1505	305	25	*	*	*
Barley..... .	-	-	-	-	*	-
Wheat..... .	*	*	*	*	*	*
Maize..... .	*	*	*	*	*	*
Sorghum..... .	-	-	-	-	*	-
Finger millet..... .	-	-	-	-	*	-
Oats/'Aja'..... .	-	-	-	-	*	-
Rice..... .	-	-	-	-	*	-
Pulses..... .	527	152	12	*	*	
Faba beans..... .	-	-	-	-	*	-
Field peas..... .	-	-	-	-	*	-
Haricot beans..... .	359	120	10	*	*	*
Chick-peas..... .	*	*	*	*	*	*
Lentils..... .	-	-	-	-	*	-
Grass Peas	-	-	-	-	*	-
Soya beans..... .	-	-	-	-	*	-
Fenugreek..... .	*	*	*	-	*	-
Gibto..... .	-	-	-	-	*	-
Oilseeds..... .	*	*	*	-	*	
Neug..... .	-	-	-	-	*	-
Linseed..... .	-	-	-	-	*	-
Groundnuts..... .	-	-	-	-	*	-
Sufflower..... .	-	-	-	-	*	-
Sesame..... .	*	*	*	-	*	-
Rapeseed..... .	-	-	-	-	*	-

Table 6. Croplan Area, Production and Yield of Major Belg Crops For Private Holdings
For Belg Season 2003/04 (1996 E.C.)

Amhara Region

Crop Name	Number Of Holders	Cropland Area In Hectares	%	Production In Quintals	%	Yield QT/HA
Grain Crops	436820	103116	100	116483	100	
Cereals..... .	388539	81031	79	103369	89	
Teff..... .	88555	12923	13	12513	11	1
Barley..... .	189678	39883	39	*	*	*
Wheat..... .	76244	13766	13	*	*	*
Maize..... .	132023	12146	12	43697	38	4
Sorghum..... .	*	*	*	*	*	*
Finger millet..... .	-	-	-	-	-	-
Oats/'Aja'..... .	11687	*	*	*	*	*
Rice..... .	1484	*	*	*	*	*
Pulses..... .	128614	21929	21	10481	9	
Faba beans..... .	*	*	*	*	*	*
Field peas..... .	21182	2381	2	*	*	*
Haricot beans..... .	20676	2247	2	*	*	*
Chick-peas..... .	61744	11008	11	*	*	*
Lentils..... .	29978	3350	3	*	*	*
Grass Peas	17521	1845	2	*	*	*
Soya beans..... .	*	*	*	-	-	-
Fenugreek..... .	6067	*	*	*	*	*
Gibto..... .	*	*	*	*	*	*
Oilseeds..... .	3295	*	*	*	*	
Neug..... .	-	-	-	-	-	-
Linseed..... .	1982	*	*	*	*	*
Groundnuts..... .	*	*	*	-	-	-
Sufflower..... .	-	-	-	-	-	-
Sesame..... .	-	-	-	-	-	-
Rapeseed..... .	*	*	*	*	*	*

Table 7. Croplan Area, Production and Yield of Major Belg Crops For Private Holdings
For Belg Season 2003/04 (1996 E.C.)

Oromia Region

Crop Name	Number Of Holders	Cropland Area In Hectares	%	Production In Quintals	%	Yield QT/HA
Grain Crops	1500251	468186	100	1757491	100	
Cereals..... .	1385767	412464	88	1743304	99	
Teff..... .	111786	32588	7	29916	2	1
Barley..... .	336211	101488	22	31527	2	0
Wheat..... .	162534	51263	11	22380	1	0
Maize..... .	1039489	195279	42	1343127	76	7
Sorghum..... .	79688	20016	4	302477	17	15
Finger millet..... .	*	*	*	*	*	*
Oats/'Aja'..... .	59268	10534	2	*	*	*
Rice..... .	*	*	*	-	-	-
Pulses..... .	378373	47729	10	12860	1	
Faba beans..... .	17606	854	0	*	*	*
Field peas..... .	79163	13121	3	11	-	*
Haricot beans..... .	277399	26745	6	5041	0	0
Chick-peas..... .	13131	1803	0	*	*	*
Lentils..... .	25894	2255	0	*	*	*
Grass Peas	*	*	*	*	*	*
Soya beans..... .	-	-	-	-	-	-
Fenugreek..... .	8094	*	*	*	*	*
Gibto..... .	-	-	-	-	-	-
Oilseeds..... .	28296	7992	2	*	*	
Neug..... .	*	*	*	*	*	*
Linseed..... .	22959	7467	2	*	*	*
Groundnuts..... .	-	-	-	-	-	-
Sufflower..... .	-	-	-	-	-	-
Sesame..... .	*	*	*	*	*	*
Rapeseed..... .	*	57	0	*	*	*

Table 8. Croplan Area, Production and Yield of Major Belg Crops For Private Holdings
For Belg Season 2003/04 (1996 E.C.)

Somale Region

Crop Name	Number Of Holders	Cropland Area In Hectares	%	Production In Quintals	%	Yield QT/HA
Grain Crops	25817	12841	100	2357	100	
Cereals..... .	25644	12442	97	2357	100	
Teff..... .	*	*	*	-	-	-
Barley..... .	*	*	*	*	*	*
Wheat..... .	1926	198	2	*	*	*
Maize..... .	25358	12106	94	718	30	0
Sorghum..... .	698	87	1	1638	70	19
Finger millet..... .	-	-	-	-	-	-
Oats/'Aja'..... .	-	-	-	-	-	-
Rice..... .	-	-	-	-	-	-
Pulses..... .	2796	399	3	*	*	
Faba beans..... .	-	-	-	-	-	-
Field peas..... .	*	*	*	*	*	*
Haricot beans..... .	2320	278	2	*	*	*
Chick-peas..... .	-	-	-	-	-	-
Lentils..... .	-	-	-	-	-	-
Grass Peas	-	-	-	-	-	-
Soya beans..... .	-	-	-	-	-	-
Fenugreek..... .	-	-	-	-	-	-
Gibto..... .	-	-	-	-	-	-
Oilseeds..... .	-	-	-	-	-	
Neug..... .	-	-	-	-	-	-
Linseed..... .	-	-	-	-	-	-
Groundnuts..... .	-	-	-	-	-	-
Sufflower..... .	-	-	-	-	-	-
Sesame..... .	-	-	-	-	-	-
Rapeseed..... .	-	-	-	-	-	-

Table 9. Croplan Area, Production and Yield of Major Belg Crops For Private Holdings
For Belg Season 2003/04 (1996 E.C.)

Benshangul-Gumuz Region

Crop Name	Number Of Holders	Cropland Area In Hectares	%	Production In Quintals	%	Yield QT/HA	
Grain Crops	9630	818	100		*	*	
Cereals..... .	6707	547	67		*	*	
Teff..... .	-	-	-	-	*	-	
Barley..... .	-	-	-	-	*	-	
Wheat..... .	-	-	-	-	*	-	
Maize..... .	6707	547	67		*	*	*
Sorghum..... .	-	-	-	-	*	-	
Finger millet..... .	-	-	-	-	*	-	
Oats/'Aja'..... .	-	-	-	-	*	-	
Rice..... .	-	-	-	-	*	-	
Pulses..... .	*	*	*	0	*		
Faba beans..... .	-	-	-	-	*	-	
Field peas..... .	-	-	-	-	*	-	
Haricot beans..... .	*	*	*	0	*	*	
Chick-peas..... .	-	-	-	-	*	-	
Lentils..... .	-	-	-	-	*	-	
Grass Peas	-	-	-	-	*	-	
Soya beans..... .	-	-	-	-	*	-	
Fenugreek..... .	-	-	-	-	*	-	
Gibto..... .	-	-	-	-	*	-	
Oilseeds..... .	-	-	-	-	*		
Neug..... .	-	-	-	-	*	-	
Linseed..... .	-	-	-	-	*	-	
Groundnuts..... .	-	-	-	-	*	-	
Sufflower..... .	-	-	-	-	*	-	
Sesame..... .	-	-	-	-	*	-	
Rapeseed..... .	-	-	-	-	*	-	

Table 10. Croplan Area, Production and Yield of Major Belg Crops For Private Holdings For Belg Season 2003/04 (1996 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	1479882	285977	100	740996	100	
Cereals..... .	1375648	255383	89	716763	97	
Teff..... .	53102	17206	6	*	*	*
Barley..... .	93302	11675	4	*	*	*
Wheat..... .	13205	1881	1	*	*	*
Maize..... .	1273657	198814	70	597122	81	3
Sorghum..... .	83771	25311	9	113744	15	4
Finger millet..... .	4417	468	0	1	-	*
Oats/'Aja'..... .	*	*	*	*	*	*
Rice..... .	*	*	*	-	-	-
Pulses..... .	379510	29513	10	24208	3	
Faba beans..... .	13857	526	0	1	-	*
Field peas..... .	13735	1324	0	*	*	*
Haricot beans..... .	360260	27541	10	24124	3	1
Chick-peas..... .	633	59	0	*	*	*
Lentils..... .	438	30	0	*	*	*
Grass Peas	*	*	*	-	-	-
Soya beans..... .	*	*	*	-	-	-
Fenugreek..... .	1117	16	-	*	*	*
Gibto..... .	*	*	*	-	-	-
Oilseeds..... .	10290	*	*	*	*	
Neug..... .	*	*	*	*	*	*
Linseed..... .	528	16	-	*	*	*
Groundnuts..... .	8477	*	*	*	*	*
Sufflower..... .	-	-	-	-	-	-
Sesame..... .	-	-	-	-	-	-
Rapeseed..... .	*	*	*	*	*	*

Table 11. Croplan Area, Production and Yield of Major Belg Crops For Private Holdings
For Belg Season 2003/04 (1996 E.C.)

Harari Region

Crop Name	Number Of Holders	Cropland Area In Hectares	%	Production In Quintals	%	Yield QT/HA
Grain Crops	1393	90	100	*	*	
Cereals..... .	1221	76	84	*	*	
Teff..... .	-	-	-	-	*	-
Barley..... .	-	-	-	-	*	-
Wheat..... .	-	-	-	-	*	-
Maize..... .	607	23	25	*	*	*
Sorghum..... .	687	53	59	*	*	*
Finger millet..... .	-	-	-	-	*	-
Oats/'Aja'..... .	-	-	-	-	*	-
Rice..... .	-	-	-	-	*	-
Pulses..... .	176	*	*	*	*	
Faba beans..... .	-	-	-	-	*	-
Field peas..... .	-	-	-	-	*	-
Haricot beans..... .	176	*	*	*	*	*
Chick-peas..... .	-	-	-	-	*	-
Lentils..... .	-	-	-	-	*	-
Grass Peas	-	-	-	-	*	-
Soya beans..... .	-	-	-	-	*	-
Fenugreek..... .	-	-	-	-	*	-
Gibto..... .	-	-	-	-	*	-
Oilseeds..... .	*	*	*	*	*	
Neug..... .	-	-	-	-	*	-
Linseed..... .	-	-	-	-	*	-
Groundnuts..... .	*	*	*	*	*	*
Sufflower..... .	-	-	-	-	*	-
Sesame..... .	-	-	-	-	*	-
Rapeseed..... .	-	-	-	-	*	-

Table 12. Croplan Area, Production and Yield of Major Belg Crops For Private Holdings
For Belg Season 2003/04 (1996 E.C.)

Dire Da wa

Crop Name	Number Of Holders	Cropland Area In Hectares	%	Production In Quintals	%	Yield QT/HA
Grain Crops	2098	147	100	*	*	
Cereals..... .	2098	147	100	*	*	
Teff..... .	-	-	-	-	*	-
Barley..... .	-	-	-	-	*	-
Wheat..... .	-	-	-	-	*	-
Maize..... .	1714	103	70	*	*	*
Sorghum..... .	466	*	*	*	*	*
Finger millet..... .	-	-	-	-	*	-
Oats/'Aja'..... .	-	-	-	-	*	-
Rice..... .	-	-	-	-	*	-
Pulses..... .	-	-	-	-	*	
Faba beans..... .	-	-	-	-	*	-
Field peas..... .	-	-	-	-	*	-
Haricot beans..... .	-	-	-	-	*	-
Chick-peas..... .	-	-	-	-	*	-
Lentils..... .	-	-	-	-	*	-
Grass Peas	-	-	-	-	*	-
Soya beans..... .	-	-	-	-	*	-
Fenugreek..... .	-	-	-	-	*	-
Gibto..... .	-	-	-	-	*	-
Oilseeds..... .	-	-	-	-	*	
Neug..... .	-	-	-	-	*	-
Linseed..... .	-	-	-	-	*	-
Groundnuts..... .	-	-	-	-	*	-
Sufflower..... .	-	-	-	-	*	-
Sesame..... .	-	-	-	-	*	-
Rapeseed..... .	-	-	-	-	*	-

Table 1. Estimates of 2001/02 (1994 E.C.) and 2003/04 (1996 E.C.) Area, Production and Yield of Major Belg Season Crops for Peasant Holdings in Ethiopia

Crop Type	Total Area ('000 Ha)			Total Production ('000 Qt)			Yield		
	2001/02 (1994 E.C.)	2003/04 (1996 E.C.)	% Change	2001/02 (1994 E.C.)	2003/04 (1996 E.C.)	% Change	2001/02 (1994 E.C.)	2003/04 (1996 E.C.)	% Change
Grain Crop	**856.1**	**897.42**	**4.83**	**4352.15**	**2704.83**	**-37.85**			
Cereals	**701.99**	**786.55**	**12.05**	**3613.45**	**2652.02**	**-26.61**			
Teff	47.09	7.54	-83.99	176.92	9.73	-94.50	3.76	1.29	-65.65
Barley	183.72	155.31	-15.46	474.82	76.87	-83.81	2.58	0.49	-80.85
Wheat	60.71	67.42	11.05	165.08	36.52	-77.88	2.72	0.54	-80.08
Maize	348.42	424	21.69	2501.85	2009.15	-19.69	7.18	4.74	-34.01
Sorghum	44.46	52.18	17.36	253.47	418.29	65.03	5.70	8.02	40.61
Finger Millet	1.27	*	*	*	*	*	*	*	*
Oats/'Aja'	13.55	11.8	-12.92	8732.12	*		644.44	*	*
Rice	*	*	*	*	*	*	*	*	*
Pulses	**151.01**	**101.63**	**-32.70**	**715.08**	**48.83**	**-93.17**			
Fabab Beans	2.52	1.45	-42.46	26.51	*		10.52		-100.00
Field Peas	2.8	17.2	514.29	69.79	*		24.93		-100.00
Haricot Beans	86.78	57.21	-34.07	525.47	33.04	-93.71	6.06	0.58	-90.46
Chick Peas	10.18	13.81	35.66	51.12	*	*	5.02	*	*
Lentils	15.31	5.74	-62.51	30.31	*	*	1.98	*	*
Grass Peas	1.46	3.9	167.12	*	*	*	*	*	*
Soya Bean	0.03	*		*	*	*	*	*	*
Fenugreek	4.91	1.57	-68.02	5.42	*		1.10	*	*
Gibto	0.01	*	*	*	*	*	*	*	*
Oilseeds	**4.09**	**9.24**	**125.92**	*****	*****	*****			
Neug	0.06	7.62	12600.00	*	*	*	*	*	*
Line Seed	3.48	*	*	*	*	*	*	*	*
Groundnuts	0.45	*	*	*	*	*	*	*	*
Sufflower	0.08	*	*	*	*	*	*	*	*
Sesame	0.03	*	*	*	*	*	*	*	*
Rapeseed	*	0.08	*	*	*	*	*	*	*

* Excluding Gambella Region

Table 2. Estimates of 2001/02(1994 E.C.) and 2003/04(1996 E.C.) Area and Production of Major Belg Season Crops for Peasant Holdings in Ethiopia, by Region

Region	Area under major crops ('000 Ha)			Production under major crops ('000 Qt)		
	2001/02 (1994 E.C.)	2003/04 (1996 E.C.)	% Change	2001/02 (1994 E.C.)	2003/04 (1996 E.C.)	% Change
Tigray	11.25	25	122.22	23.14	68.38	195.51
Afar	0.77	12.42		0.11	*	-
Amhara	158.59	103.12	-34.97	725.66	116.48	-83.94
Oromiya	417.28	468.19	12.20	1153.53	1757.49	52.35
Somali	7.87	12.84	63.15	5.94	2.36	-60.27
Benshangul-Gumz	0.48	0.82	70.83	1.97	*	-
S.N.N.P	258.63	285.98	10.57	2431.63	741	-69.53
Gambela	NA	NA	NA	NA	NA	NA
Harari	0.95	0.08	-90.52	*	*	-
Addis Ababa	*	-	-	*	-	-
Dire Dawa	0.26	0.15	-42.30	*	*	-
All Regions	**856.1**	**908.6**	**5.77**	**4352.2**	**2685.71**	**-38.50**

Table 3. Croplan Area, Production and Yield of Major Belg Crops For Private Holdings
For Belg Season 2003/04 (1996 E.C.)

Etiopia

Crop Name	Number Of Holders	Cropland Area In Hectares	%	Production In Quintals	%	Yield QT/HA
Grain Crops	3521476	897419	100	2704838	100	
Cereals..... .	3247003	786550	88	2652019	98	
Teff..... .	272410	73535	8	97311	4	1
Barley..... .	633949	155305	17	76874	3	0
Wheat..... .	256165	67420	8	36515	1	1
Maize..... .	2509861	424001	47	2009152	74	5
Sorghum..... .	174034	52176	6	418288	15	8
Finger millet..... .	9569	*	*	*	*	*
Oats/'Aja'..... .	71520	11797	1	*	*	*
Rice..... .	3006	*	*	*	*	*
Pulses..... .	901422	101627	11	48834	2	
Faba Beans	32120	1467	0	*	*	*
Field peas..... .	115779	17202	2	*	*	*
Haricot beans..... .	664840	57211	6	33041	1	1
Chick-peas..... .	79203	13808	2	*	*	*
Lentils..... .	57440	5744	1	*	*	*
Grass Peas	26985	3897	0	*	*	*
Soya beans..... .	*	*	*	-	-	-
Fenugreek..... .	16378	1586	0	*	*	*
Gibto..... .	*	*	*	*	*	*
Oilseeds..... .	41952	9242	1	*	*	
Neug..... .	*	*	*	*	*	*
Linseed..... .	25469	7620	1	*	*	*
Groundnuts..... .	9029	*	*	*	*	*
Sufflower..... .	-	-	-	-	-	-
Sesame..... .	*	*	*	*	*	*
Rapeseed..... .	5067	77	-	*	*	*

Table 4. Croplan Area, Production and Yield of Major Belg Crops For Private Holdings
For Belg Season 2003/04 (1996 E.C.)

Tigray Region

Crop Name	Number Of Holders	Cropland Area In Hectares	%	Production In Quintals	%	Yield QT/HA
Grain Crops	62915	25002	100	68376	100	
Cereals..... .	58807	23380	94	67582	99	
Teff..... .	17398	*	*	53809	79	*
Barley..... .	14089	2214	9	*	*	*
Wheat..... .	*	*	*	*	*	*
Maize..... .	29293	4270	17	6258	9	1
Sorghum..... .	*	*	*	*	*	*
Finger millet..... .	1925	1	-	-	-	-
Oats/'Aja'..... .	-	-	-	-	-	-
Rice..... .	-	-	-	-	-	-
Pulses..... .	7776	1622	6	*	*	
Faba Beans	*	*	*	*	*	*
Field peas..... .	*	*	*	*	*	*
Haricot beans..... .	-	-	-	-	-	-
Chick-peas..... .	3503	*	*	6	-	*
Lentils..... .	*	*	*	*	*	*
Grass Peas	*	*	*	*	*	*
Soya beans..... .	-	-	-	-	-	-
Fenugreek..... .	1078	29	0	-	-	-
Gibto..... .	-	-	-	-	-	-
Oilseeds..... .	-	-	-	-	-	
Neug..... .	-	-	-	-	-	-
Linseed..... .	-	-	-	-	-	-
Groundnuts..... .	-	-	-	-	-	-
Sufflower..... .	-	-	-	-	-	-
Sesame..... .	-	-	-	-	-	-
Rapeseed..... .	-	-	-	-	-	-

Table 5. Croplan Area, Production and Yield of Major Belg Crops For Private Holdings
For Belg Season 2003/04 (1996 E.C.)

Afar Region

Crop Name	Number Of Holders	Cropland Area In Hectares	%	Production In Quintals	%	Yield QT/HA
Grain Crops	2670	1243	100	*	*	
Cereals..... .	2572	1081	87	0	*	
Teff..... .	1505	305	25	*	*	*
Barley..... .	-	-	-	-	*	-
Wheat..... .	*	*	*	*	*	*
Maize..... .	*	*	*	*	*	*
Sorghum..... .	-	-	-	-	*	-
Finger millet..... .	-	-	-	-	*	-
Oats/'Aja'..... .	-	-	-	-	*	-
Rice..... .	-	-	-	-	*	-
Pulses..... .	527	152	12	*	*	
Faba beans..... .	-	-	-	-	*	-
Field peas..... .	-	-	-	-	*	-
Haricot beans..... .	359	120	10	*	*	*
Chick-peas..... .	*	*	*	*	*	*
Lentils..... .	-	-	-	-	*	-
Grass Peas	-	-	-	-	*	-
Soya beans..... .	-	-	-	-	*	-
Fenugreek..... .	*	*	*	-	*	-
Gibto..... .	-	-	-	-	*	-
Oilseeds..... .	*	*	*	-	*	
Neug..... .	-	-	-	-	*	-
Linseed..... .	-	-	-	-	*	-
Groundnuts..... .	-	-	-	-	*	-
Sufflower..... .	-	-	-	-	*	-
Sesame..... .	*	*	*	-	*	-
Rapeseed..... .	-	-	-	-	*	-

Table 6. Croplan Area, Production and Yield of Major Belg Crops For Private Holdings
For Belg Season 2003/04 (1996 E.C.)

Amhara Region

Crop Name	Number Of Holders	Cropland Area In Hectares	%	Production In Quintals	%	Yield QT/HA
Grain Crops	436820	103116	100	116483	100	
Cereals..... .	388539	81031	79	103369	89	
Teff..... .	88555	12923	13	12513	11	1
Barley..... .	189678	39883	39	*	*	*
Wheat..... .	76244	13766	13	*	*	*
Maize..... .	132023	12146	12	43697	38	4
Sorghum..... .	*	*	*	*	*	*
Finger millet..... .	-	-	-	-	-	-
Oats/'Aja'..... .	11687	*	*	*	*	*
Rice..... .	1484	*	*	*	*	*
Pulses..... .	128614	21929	21	10481	9	
Faba beans..... .	*	*	*	*	*	*
Field peas..... .	21182	2381	2	*	*	*
Haricot beans..... .	20676	2247	2	*	*	*
Chick-peas..... .	61744	11008	11	*	*	*
Lentils..... .	29978	3350	3	*	*	*
Grass Peas	17521	1845	2	*	*	*
Soya beans..... .	*	*	*	-	-	-
Fenugreek..... .	6067	*	*	*	*	*
Gibto..... .	*	*	*	*	*	*
Oilseeds..... .	3295	*	*	*	*	
Neug..... .	-	-	-	-	-	-
Linseed..... .	1982	*	*	*	*	*
Groundnuts..... .	*	*	*	-	-	-
Sufflower..... .	-	-	-	-	-	-
Sesame..... .	-	-	-	-	-	-
Rapeseed..... .	*	*	*	*	*	*

Table 7. Croplan Area, Production and Yield of Major Belg Crops For Private Holdings
For Belg Season 2003/04 (1996 E.C.)

Oromia Region

Crop Name	Number Of Holders	Cropland Area In Hectares	%	Production In Quintals	%	Yield QT/HA
Grain Crops	1500251	468186	100	1757491	100	
Cereals..... .	1385767	412464	88	1743304	99	
Teff..... .	111786	32588	7	29916	2	1
Barley..... .	336211	101488	22	31527	2	0
Wheat..... .	162534	51263	11	22380	1	0
Maize..... .	1039489	195279	42	1343127	76	7
Sorghum..... .	79688	20016	4	302477	17	15
Finger millet..... .	*	*	*	*	*	*
Oats/'Aja'..... .	59268	10534	2	*	*	*
Rice..... .	*	*	*	-	-	-
Pulses..... .	378373	47729	10	12860	1	
Faba beans..... .	17606	854	0	*	*	*
Field peas..... .	79163	13121	3	11	-	*
Haricot beans..... .	277399	26745	6	5041	0	0
Chick-peas..... .	13131	1803	0	*	*	*
Lentils..... .	25894	2255	0	*	*	*
Grass Peas	*	*	*	*	*	*
Soya beans..... .	-	-	-	-	-	-
Fenugreek..... .	8094	*	*	*	*	*
Gibto..... .	-	-	-	-	-	-
Oilseeds..... .	28296	7992	2	*	*	
Neug..... .	*	*	*	*	*	*
Linseed..... .	22959	7467	2	*	*	*
Groundnuts..... .	-	-	-	-	-	-
Sufflower..... .	-	-	-	-	-	-
Sesame..... .	*	*	*	*	*	*
Rapeseed..... .	*	57	0	*	*	*

Table 8. Croplan Area, Production and Yield of Major Belg Crops For Private Holdings
For Belg Season 2003/04 (1996 E.C.)

Somale Region

Crop Name	Number Of Holders	Cropland Area In Hectares	%	Production In Quintals	%	Yield QT/HA
Grain Crops	25817	12841	100	2357	100	
Cereals..... .	25644	12442	97	2357	100	
Teff..... .	*	*	*	-	-	-
Barley..... .	*	*	*	*	*	*
Wheat..... .	1926	198	2	*	*	*
Maize..... .	25358	12106	94	718	30	0
Sorghum..... .	698	87	1	1638	70	19
Finger millet..... .	-	-	-	-	-	-
Oats/'Aja'..... .	-	-	-	-	-	-
Rice..... .	-	-	-	-	-	-
Pulses..... .	2796	399	3	*	*	
Faba beans..... .	-	-	-	-	-	-
Field peas..... .	*	*	*	*	*	*
Haricot beans..... .	2320	278	2	*	*	*
Chick-peas..... .	-	-	-	-	-	-
Lentils..... .	-	-	-	-	-	-
Grass Peas	-	-	-	-	-	-
Soya beans..... .	-	-	-	-	-	-
Fenugreek..... .	-	-	-	-	-	-
Gibto..... .	-	-	-	-	-	-
Oilseeds..... .	-	-	-	-	-	
Neug..... .	-	-	-	-	-	-
Linseed..... .	-	-	-	-	-	-
Groundnuts..... .	-	-	-	-	-	-
Sufflower..... .	-	-	-	-	-	-
Sesame..... .	-	-	-	-	-	-
Rapeseed..... .	-	-	-	-	-	-

Table 9. Croplan Area, Production and Yield of Major Belg Crops For Private Holdings
For Belg Season 2003/04 (1996 E.C.)

Benshangul-Gumuz Region

Crop Name	Number Of Holders	Cropland Area In Hectares	%	Production In Quintals	%	Yield QT/HA	
Grain Crops	9630	818	100		*	*	
Cereals..... .	6707	547	67		*	*	
Teff..... .	-	-	-	-	*	-	
Barley..... .	-	-	-	-	*	-	
Wheat..... .	-	-	-	-	*	-	
Maize..... .	6707	547	67		*	*	*
Sorghum..... .	-	-	-	-	*	-	
Finger millet..... .	-	-	-	-	*	-	
Oats/'Aja'..... .	-	-	-	-	*	-	
Rice..... .	-	-	-	-	*	-	
Pulses..... .	*	*	*	0	*		
Faba beans..... .	-	-	-	-	*	-	
Field peas..... .	-	-	-	-	*	-	
Haricot beans..... .	*	*	*	0	*	*	
Chick-peas..... .	-	-	-	-	*	-	
Lentils..... .	-	-	-	-	*	-	
Grass Peas	-	-	-	-	*	-	
Soya beans..... .	-	-	-	-	*	-	
Fenugreek..... .	-	-	-	-	*	-	
Gibto..... .	-	-	-	-	*	-	
Oilseeds..... .	-	-	-	-	*		
Neug..... .	-	-	-	-	*	-	
Linseed..... .	-	-	-	-	*	-	
Groundnuts..... .	-	-	-	-	*	-	
Sufflower..... .	-	-	-	-	*	-	
Sesame..... .	-	-	-	-	*	-	
Rapeseed..... .	-	-	-	-	*	-	

Table 10. Croplan Area, Production and Yield of Major Belg Crops For Private Holdings For Belg Season 2003/04 (1996 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	1479882	285977	100	740996	100	
Cereals..... .	1375648	255383	89	716763	97	
Teff..... .	53102	17206	6	*	*	*
Barley..... .	93302	11675	4	*	*	*
Wheat..... .	13205	1881	1	*	*	*
Maize..... .	1273657	198814	70	597122	81	3
Sorghum..... .	83771	25311	9	113744	15	4
Finger millet..... .	4417	468	0	1	-	*
Oats/'Aja'..... .	*	*	*	*	*	*
Rice..... .	*	*	*	-	-	-
Pulses..... .	379510	29513	10	24208	3	
Faba beans..... .	13857	526	0	1	-	*
Field peas..... .	13735	1324	0	*	*	*
Haricot beans..... .	360260	27541	10	24124	3	1
Chick-peas..... .	633	59	0	*	*	*
Lentils..... .	438	30	0	*	*	*
Grass Peas	*	*	*	-	-	-
Soya beans..... .	*	*	*	-	-	-
Fenugreek..... .	1117	16	-	*	*	*
Gibto..... .	*	*	*	-	-	-
Oilseeds..... .	10290	*	*	*	*	
Neug..... .	*	*	*	*	*	*
Linseed..... .	528	16	-	*	*	*
Groundnuts..... .	8477	*	*	*	*	*
Sufflower..... .	-	-	-	-	-	-
Sesame..... .	-	-	-	-	-	-
Rapeseed..... .	*	*	*	*	*	*

Table 11. Croplan Area, Production and Yield of Major Belg Crops For Private Holdings
For Belg Season 2003/04 (1996 E.C.)

Harari Region

Crop Name	Number Of Holders	Cropland Area In Hectares	%	Production In Quintals	%	Yield QT/HA
Grain Crops	1393	90	100	*	*	
Cereals..... .	1221	76	84	*	*	
Teff..... .	-	-	-	-	*	-
Barley..... .	-	-	-	-	*	-
Wheat..... .	-	-	-	-	*	-
Maize..... .	607	23	25	*	*	*
Sorghum..... .	687	53	59	*	*	*
Finger millet..... .	-	-	-	-	*	-
Oats/'Aja'..... .	-	-	-	-	*	-
Rice..... .	-	-	-	-	*	-
Pulses..... .	176	*	*	*	*	
Faba beans..... .	-	-	-	-	*	-
Field peas..... .	-	-	-	-	*	-
Haricot beans..... .	176	*	*	*	*	*
Chick-peas..... .	-	-	-	-	*	-
Lentils..... .	-	-	-	-	*	-
Grass Peas	-	-	-	-	*	-
Soya beans..... .	-	-	-	-	*	-
Fenugreek..... .	-	-	-	-	*	-
Gibto..... .	-	-	-	-	*	-
Oilseeds..... .	*	*	*	*	*	
Neug..... .	-	-	-	-	*	-
Linseed..... .	-	-	-	-	*	-
Groundnuts..... .	*	*	*	*	*	*
Sufflower..... .	-	-	-	-	*	-
Sesame..... .	-	-	-	-	*	-
Rapeseed..... .	-	-	-	-	*	-

Table 12. Croplan Area, Production and Yield of Major Belg Crops For Private Holdings
For Belg Season 2003/04 (1996 E.C.)

Dire Da wa

Crop Name	Number Of Holders	Cropland Area In Hectares	%	Production In Quintals	%	Yield QT/HA
Grain Crops	2098	147	100	*	*	
Cereals..... .	2098	147	100	*	*	
Teff..... .	-	-	-	-	*	-
Barley..... .	-	-	-	-	*	-
Wheat..... .	-	-	-	-	*	-
Maize..... .	1714	103	70	*	*	*
Sorghum..... .	466	*	*	*	*	*
Finger millet..... .	-	-	-	-	*	-
Oats/'Aja'..... .	-	-	-	-	*	-
Rice..... .	-	-	-	-	*	-
Pulses..... .	-	-	-	-	*	
Faba beans..... .	-	-	-	-	*	-
Field peas..... .	-	-	-	-	*	-
Haricot beans..... .	-	-	-	-	*	-
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:

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

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

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:

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

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 I Estimation Procedures of Totals, Ratios and Sampling Errors

The following formulas were used to estimate total area of land under specific crop, total holders and ratios 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 h[th] stratum.

M_h is the measure of size of the h[th] stratum as obtained from the sampling frame.

m_{hi} is the measure of size of the i[th] sample EA in the h[th] stratum obtained from the sampling frame.

H_{hi} is the total number of agricultural households of the i[th] sample EA in the h[th] stratum.

h_{hi} is the number of sample agricultural households successfully covered in the i[th] sample EA in the h[th] stratum.

a_{hij} is the value of area for agricultural households j, in the i[th] EA in the h[th] 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 number of Holders:

$$\hat{Y}_h = \sum_{i=1}^{n_h} W_{hi} y_{hi}$$

Where:

y_{hi} is the sample total number of holders of i[th] EA in the h[th] stratum.

$\hat{Y}_h$ is estimate of total number of holders for the h[th] stratum.

W_{hi} is as defined above.

3. For estimating quantity of fertilizer in stratum h:

$$\hat{Q}_h = \sum_{i=1}^{n_h} W_{hi} q_{hi}$$

where,

$\hat{Q}_h$ is estimate of total quantity of a specific fertilizer applied for a specific crop land in the h[th] stratum.

q_{hi} is the sample total of a specific fertilizer applied for a specific crop land in the i[th] EA in the h[th] stratum.

W_{hi} is as defined above.

4. For estimating Ratios in stratum h:

$$\hat{R}_h = \frac{\hat{Z}_h}{\hat{X}_h},$$

Where the numerator and denominator are estimates of domain totals for characteristic z and x, respectively.

5. Sampling Variance of Estimates:

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

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

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

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

$$Var(\hat{R}_h) = \frac{1}{\hat{X}_h^{\,2}}\left[Var(\hat{Z}_h) + \hat{R}_h^{\,2}Var(\hat{X}_h) - 2\hat{R}_h Cov(\hat{Z}_h, \hat{X}_h)\right]$$

Where,

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

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*.

$\hat{A}_{hi}, \hat{Y}_{hi}, \hat{Q}_{hi}, \hat{Z}_{hi}, \hat{X}_{hi}$ are weighted total area, holder, quantity of fertilizer, characteristics z and x, respectively, in the i^{th} EA and h^{th} stratum.

$\hat{A}_{hij}, \hat{Y}_{hij}, \hat{Q}_{hij}, \hat{Z}_{hij}, \hat{X}_{hij}$ are weighted value of area, holder, quantity of fertilizer, characteristics z and x, respectively, from j^{th} agricultural household in the i^{th} EA and h^{th} stratum.

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.

$$Var(\hat{A}) = \sum_{h}^{L} Var(\hat{A}_h), Var(\hat{Y}) = \sum_{h}^{L} Var(\hat{Y}_h), Var(\hat{Q}) = \sum_{i=1}^{L} Var(\hat{Q}_h), Var(\hat{R}) = \sum_{h}^{L} Var(\hat{R}_h)$$

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.

6. Coefficient of Variation (CV) of Estimates:

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

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

7. Ninety-five percent confidence interval (CI) of stratum total of area:

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

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, 2003/4 (1996 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	3521476	84634.97		2.4	897419.29	41654.96		4.64	2704838.08	393173.70		14.54
Cereals.....	3247003	84229.59		2.59	786550.25	38209.02		4.86	2652018.91	391947.31		14.78
Teff.....	272410	28588.16		10.49	73535.39	9505.41		12.93	97311.17	30404.27		31.24
Barley.....	633949	48007.35		7.57	155305.3	19487.23		12.55	76874.47	30454.80		39.62
Wheat.....	256165	28143.07		10.99	67420.18	10962.39		16.26	36515.43	12385.73		33.92
Maize.....	2509861	73019.33		2.91	424001.46	21333.31		5.03	2009151.97	294834.61		14.67
Sorghum.....	174034	19484.81		11.2	52176.18	9218.39		17.67	418287.54	130655.55		31.24
Finger millet.....	9569	2484.64		25.96	1756.16	924.02		52.62	2.71	1.93		71.52
Oats/'Aja'.....	71520	13715.18		19.18	11797.43	2924.91		24.79	13875.58	9527.11		68.66
Rice.....	3006	1002.13		33.33	558.14	337.85		60.53	0.04	0.03		70.32
Pulses.....	901422	42791.33		4.75	101626.56	7245.16		7.13	48834.48	12710.00		26.03
Horse.beans.....	32120	6585.99		20.5	1467.2	385.85		26.3	3013.77	3014.51		100.02
Field.peas.....	115779	18094.71		15.63	17201.94	3345.37		19.45	1758.68	1157.27		65.8
Haricot beans.....	664840	33993.88		5.11	57211.21	4798.5		8.39	33041.41	10732.87		32.48
Chick-peas.....	79203	13776.02		17.39	13808.26	2516.54		18.22	1106.62	748.76		67.66
Lentils.....	57440	11045.24		19.23	5743.77	1413.54		24.61	3062.49	2417.68		78.94
Vetch.....	26985	7707.34		28.56	3896.8	1500.39		38.5	4847.9	4601.74		94.92
Soya beans.....	707	425.03		60.08	25.22	15.58		61.78	-	-		-
Fenugreek.....	16378	4811.79		29.38	1586	740.82		46.71	2.54	1.44		56.62
Gibto.....	4880	3752.63		76.89	686.16	479.89		69.94	2001.08	2003.91		100.14
Oilseeds.....	41952	9721.74		23.17	9242.49	3498.52		37.85	3984.69	2786.52		69.93
Neug.....	1363	1031.47		75.66	161.74	114.75		70.95	989.24	990.21		100.1
Linseed.....	25469	8812.83		34.6	7620.45	3441.78		45.16	419.48	340.75		81.23
Groundnuts.....	9029	3532.53		39.13	1061.86	656.73		61.85	0.44	0.25		56.25
Sufflower.....	-	-		-	-	-		-	-	-		-
Sesame.....	1672	1340.48		80.16	321.78	292.61		90.94	0.03	0.03		100.19
Rapeseed.....	5067	1906.25		37.62	76.65	30.03		39.17	2575.51	2585.90		100.4

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	62915	9634.58		15.31	25001.76	11310.58		45.24	68375.91	28551.72		41.76
Cereals.....	58807	9681.46		16.46	23379.94	11280.96		48.25	67582.24	28590.39		42.3
Teff.....	17398	7835.64		45.04	10508.98	5545.85		52.77	53809.44	26788.10		49.78
Barley.....	14089	4076.1		28.93	2214.03	662.01		29.9	7501.12	4903.10		65.36
Wheat.....	2175	1440.25		66.21	251.45	177.77		70.7	0.64	0.56		87.99
Maize.....	29293	5392.03		18.41	4269.59	996.15		23.33	6257.61	1496.76		23.92
Sorghum.....	5365	5279.13		98.39	6135.01	6037.33		98.41	13.45	13.23		98.4
Finger millet.....	1925	-		-	0.87	-		-	-	-		-
Oats/'Aja'.....	-	-		-	-	-		-	-	-		-
Rice.....	-	-		-	-	-		-	-	-		-
Pulses.....	7776	1574.6		20.25	1621.82	657.49		40.54	793.67	784.00		98.78
Horse.beans.....	295	291		98.57	48.35	47.67		98.6	0.04	0.04		98.62
Field.peas.....	1223	883.21		72.22	254.72	180.84		70.99	786.85	784.07		99.65
Haricot beans.....	-	-		-	-	-		-	-	-		-
Chick-peas.....	3503	1047.43		29.9	905.28	484.05		53.47	5.67	0.93		16.43
Lentils.....	1129	750.67		66.47	108.7	83.66		76.96	0.91	0.88		96.78
Vetch.....	1139	615.1		54.01	276.05	167.65		60.73	0.2	0.14		70.47
Soya beans.....	-	-		-	-	-		-	-	-		-
Fenugreek.....	1078	178.93		16.6	28.72	10.12		35.22	-	-		-
Gibto.....	-	-		-	-	-		-	-	-		-
Oilseeds.....	-	-		-	-	-		-	-	-		-
Neug.....	-	-		-	-	-		-	-	-		-
Linseed.....	-	-		-	-	-		-	-	-		-
Groundnuts.....	-	-		-	-	-		-	-	-		-
Sufflower.....	-	-		-	-	-		-	-	-		-
Sesame.....	-	-		-	-	-		-	-	-		-
Rapeseed.....	-	-		-	-	-		-	-	-		-

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	2670	840.43		31.48	1242.94	512.07		41.2	491.4	506.06		102.98
Cereals.....	2572	838.05		32.59	1080.75	507.86		46.99	0.46	0.21		44.7
Teff.....	1505	574.21		38.16	304.75	118.96		39.04	0.36	0.21		56.33
Barley.....	-	-		-	-	-		-	-	-		-
Wheat.....	81	67.99		83.75	61.27	51.79		84.52	0.01	0.01		86.41
Maize.....	1013	679.43		67.09	714.73	506.57		70.88	0.09	0.06		59.77
Sorghum.....	-	-		-	-	-		-	-	-		-
Finger millet.....	-	-		-	-	-		-	-	-		-
Oats/'Aja'.....	-	-		-	-	-		-	-	-		-
Rice.....	-	-		-	-	-		-	-	-		-
Pulses.....	527	187.2		35.52	152.38	53.68		35.23	490.94	506.07		103.08
Horse.beans.....	-	-		-	-	-		-	-	-		-
Field.peas.....	-	-		-	-	-		-	-	-		-
Haricot beans.....	359	153.23		42.68	119.57	50.11		41.9	490.93	506.07		103.08
Chick-peas.....	192	113.58		59.16	32.75	20.65		63.04	0.01	0.01		84.76
Lentils.....	-	-		-	-	-		-	-	-		-
Vetch.....	-	-		-	-	-		-	-	-		-
Soya beans.....	-	-		-	-	-		-	-	-		-
Fenugreek.....	23	21.7		95.41	0.06	0.05		95.41	-	-		-
Gibto.....	-	-		-	-	-		-	-	-		-
Oilseeds.....	22	14.16		63.1	9.8	7.9		80.57	-	-		-
Neug.....	-	-		-	-	-		-	-	-		-
Linseed.....	-	-		-	-	-		-	-	-		-
Groundnuts.....	-	-		-	-	-		-	-	-		-
Sufflower.....	-	-		-	-	-		-	-	-		-
Sesame.....	22	14.16		63.1	9.8	7.9		80.57	-	-		-
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	436820	37536.17		8.59	103116.43	13036.74		12.64	116482.92	34127.74		29.3
Cereals.....	388539	36250.32		9.33	81030.97	11430.38		14.11	103369.1	33337.21		32.25
Teff.....	88555	19548.5		22.07	12923.34	3451.2		26.71	12512.57	4399.32		35.16
Barley.....	189678	28075.39		14.8	39882.57	8602.99		21.57	33048.08	27814.58		84.16
Wheat.....	76244	15962.22		20.94	13765.78	4586.01		33.31	14109.51	7712.20		54.66
Maize.....	132023	19506.33		14.77	12146.04	2267.99		18.67	43696.73	16112.39		36.87
Sorghum.....	3359	3116.89		92.8	529.53	448.68		84.73	0.51	0.48		95.03
Finger millet.....	-	-		-	-	-		-	-	-		-
Oats/'Aja'.....	11687	4947.61		42.33	1253.01	660.79		52.74	1.66	1.05		63.35
Rice.....	1484	739.42		49.84	530.72	337.53		63.6	0.04	0.03		70.32
Pulses.....	128614	19436.92		15.11	21929.38	3516.5		16.04	10480.78	3792.99		36.19
Horse.beans.....	361	358.46		99.35	38.91	38.65		99.35	0.15	0.15		99.35
Field.peas.....	21182	6724.31		31.75	2380.76	866.88		36.41	898.74	849.27		94.5
Haricot beans.....	20676	7383.79		35.71	2247.15	861.52		38.34	3385.39	1723.06		50.9
Chick-peas.....	61744	12823.91		20.77	11007.76	2353.18		21.38	1073.88	748.54		69.7
Lentils.....	29978	8327.97		27.78	3350.08	1126.73		33.63	2875.81	2414.60		83.96
Vetch.....	17521	6445.71		36.79	1844.52	703.98		38.17	245.49	240.18		97.84
Soya beans.....	308	305.74		99.22	11.28	11.19		99.22	-	-		-
Fenugreek.....	6067	2840.68		46.83	363.77	242.83		66.75	0.24	0.14		59.28
Gibto.....	4853	3752.58		77.32	685.16	479.89		70.04	2001.08	2003.91		100.14
Oilseeds.....	3295	1120.71		34.01	156.07	85.77		54.96	2633.05	2586.54		98.23
Neug.....	-	-		-	-	-		-	-	-		-
Linseed.....	1982	871.44		43.97	136.97	84.94		62.01	57.64	57.71		100.12
Groundnuts.....	503	434.02		86.21	11.62	10.64		91.57	-	-		-
Sufflower.....	-	-		-	-	-		-	-	-		-
Sesame.....	-	-		-	-	-		-	-	-		-
Rapeseed.....	809	575.77		71.14	7.48	5.7		76.14	2575.41	2585.90		100.41

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	1500251	63632.55		4.24	468185.55	34814.05		7.44	1757491.37	375442.89		21.36
Cereals.....	1385767	63253.3		4.56	412464.15	31494.71		7.64	1743303.51	375235.70		21.52
Teff.....	111786	17940.93		16.05	32587.59	6304.41		19.35	29915.86	13672.94		45.7
Barley.....	336211	36324.13		10.8	101487.67	17300.04		17.05	31527.43	11124.80		35.29
Wheat.....	162534	22842.16		14.05	51263.04	9946.65		19.4	22380.42	9691.64		43.3
Maize.....	1039489	56075.45		5.39	195278.67	16359.15		8.38	1343127.23	277986.98		20.7
Sorghum.....	79688	16755.49		21.03	20015.68	6088.15		30.42	302476.73	127801.34		42.25
Finger millet.....	3227	2190.69		67.88	1287.38	911.17		70.78	1.92	1.90		98.84
Oats/'Aja'.....	59268	12787.63		21.58	10533.58	2849.28		27.05	13873.92	9527.11		68.67
Rice.....	776	556.33		71.74	10.55	10.19		96.57	-	-		-
Pulses.....	378373	32357.46		8.55	47729.34	5682.02		11.9	12860.35	6150.36		47.82
Horse.beans.....	17606	5456.33		30.99	853.66	342.12		40.08	3013.01	3014.50		100.00
Field.peas.....	79163	16165.37		20.42	13121.02	3161.48		24.09	10.95	2.92		26.65
Haricot beans.....	277399	27070.74		9.76	26744.64	3953.54		14.78	5041.3	1874.12		37.18
Chick-peas.....	13131	4912.24		37.41	1803.42	748.48		41.5	4.82	3.22		66.64
Lentils.....	25894	7214.69		27.86	2254.78	849.32		37.67	185.75	121.97		65.66
Vetch.....	8101	4175.27		51.54	1774.3	1314.33		74.08	4602.22	4595.47		99.85
Soya beans.....	-	-		-	-	-		-	-	-		-
Fenugreek.....	8094	3852.01		47.59	1177.52	699.79		59.43	2.3	1.43		62.16
Gibto.....	-	-		-	-	-		-	-	-		-
Oilseeds.....	28296	8963.41		31.68	7992.06	3435.24		42.98	1327.51	1036.34		78.07
Neug.....	1320	1030.57		78.09	156.09	114.61		73.43	989.24	990.21		100.1
Linseed.....	22959	8767.61		38.19	7467.14	3440.72		46.08	338.15	335.09		99.1
Groundnuts.....	-	-		-	-	-		-	-	-		-
Sufflower.....	-	-		-	-	-		-	-	-		-
Sesame.....	1650	1340.41		81.25	311.98	292.51		93.76	0.03	0.03		100.19
Rapeseed.....	3016	1640.14		54.39	56.86	28.41		49.97	0.1	0.07		73.92

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	25817	4623.2		17.91	12840.58	3013.89		23.47	2356.86	-		-
Cereals.....	25644	4609.97		17.98	12441.55	2950.37		23.71	2356.72	-		-
Teff.....	64	67.66		106.5	4.86	5.18		106.5	-	-		-
Barley.....	669	447.84		66.97	46.28	29.03		62.73	0.02	0.02		75.92
Wheat.....	1926	894.18		46.43	197.57	91.18		46.15	0.03	0.02		50.17
Maize.....	25358	4617.37		18.21	12106.27	2877.18		23.77	718.42	184.14		25.63
Sorghum.....	698	176.07		25.22	86.57	25.44		29.39	1638.25	398.74		24.34
Finger millet.....	-	-		-	-	-		-	-	-		-
Oats/'Aja'.....	-	-		-	-	-		-	-	-		-
Rice.....	-	-		-	-	-		-	-	-		-
Pulses.....	2796	939.38		33.6	399.03	167.42		41.96	0.14	0.11		79.99
Horse.beans.....	-	-		-	-	-		-	-	-		-
Field.peas.....	476	460.39		96.71	121.12	118.3		97.68	0.11	0.11		97.6
Haricot beans.....	2320	818.83		35.3	277.91	118.46		42.63	0.03	0.02		60.4
Chick-peas.....	-	-		-	-	-		-	-	-		-
Lentils.....	-	-		-	-	-		-	-	-		-
Vetch.....	-	-		-	-	-		-	-	-		-
Soya beans.....	-	-		-	-	-		-	-	-		-
Fenugreek.....	-	-		-	-	-		-	-	-		-
Gibto.....	-	-		-	-	-		-	-	-		-
Oilseeds.....	-	-		-	-	-		-	-	-		-
Neug.....	-	-		-	-	-		-	-	-		-
Linseed.....	-	-		-	-	-		-	-	-		-
Groundnuts.....	-	-		-	-	-		-	-	-		-
Sufflower.....	-	-		-	-	-		-	-	-		-
Sesame.....	-	-		-	-	-		-	-	-		-
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	9630	3116.34		32.36	817.62	305.13		37.32	18038.99	14646.09		81.19
Cereals.....	6707	2377.09		35.44	547.1	225.74		41.26	18038.84	14646.10		81.19
Teff.....	-	-		-	-	-		-	-	-		-
Barley.....	-	-		-	-	-		-	-	-		-
Wheat.....	-	-		-	-	-		-	-	-		-
Maize.....	6707	2377.09		35.44	547.1	225.74		41.26	18038.84	14646.10		81.19
Sorghum.....	-	-		-	-	-		-	-	-		-
Finger millet.....	-	-		-	-	-		-	-	-		-
Oats/'Aja'.....	-	-		-	-	-		-	-	-		-
Rice.....	-	-		-	-	-		-	-	-		-
Pulses.....	3650	2010.29		55.07	270.52	185.55		68.59	0.15	0.07		46.49
Horse.beans.....	-	-		-	-	-		-	-	-		-
Field.peas.....	-	-		-	-	-		-	-	-		-
Haricot beans.....	3650	2010.29		55.07	270.52	185.55		68.59	0.15	0.07		46.49
Chick-peas.....	-	-		-	-	-		-	-	-		-
Lentils.....	-	-		-	-	-		-	-	-		-
Vetch.....	-	-		-	-	-		-	-	-		-
Soya beans.....	-	-		-	-	-		-	-	-		-
Fenugreek.....	-	-		-	-	-		-	-	-		-
Gibto.....	-	-		-	-	-		-	-	-		-
Oilseeds.....	-	-		-	-	-		-	-	-		-
Neug.....	-	-		-	-	-		-	-	-		-
Linseed.....	-	-		-	-	-		-	-	-		-
Groundnuts.....	-	-		-	-	-		-	-	-		-
Sufflower.....	-	-		-	-	-		-	-	-		-
Sesame.....	-	-		-	-	-		-	-	-		-
Rapeseed.....	-	-		-	-	-		-	-	-		-

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	1479882	39749.39		2.69	285977.1	14689.79		5.14	740995.52	106926.83		14.43
Cereals.....	1375648	40716.77		2.96	255382.6	14180.36		5.55	716762.94	103331.45		14.42
Teff.....	53102	7178.47		13.52	17205.86	2815.3		16.36	1072.94	716.87		66.81
Barley.....	93302	13424.63		14.39	11674.75	2451.57		21	4797.83	2458.14		51.23
Wheat.....	13205	3549.28		26.88	1881.07	405.31		21.55	24.82	23.79		95.83
Maize.....	1273657	41834.03		3.28	198814.01	13144.01		6.61	597122.45	95782.47		16.04
Sorghum.....	83771	7823.35		9.34	25311.26	3355.7		13.26	113744.12	27154.71		23.87
Finger millet.....	4417	1172.31		26.54	467.91	153.56		32.82	0.78	0.37		46.75
Oats/'Aja'.....	565	322.28		57.01	10.85	6.12		56.38	-	-		91.78
Rice.....	747	384.73		51.49	16.87	10.65		63.11	-	-		-
Pulses.....	379510	19971.33		5.26	29513.29	2709.89		9.18	24208.45	10414.40		43.02
Horse.beans.....	13857	3659.32		26.41	526.29	167.53		31.83	0.57	0.13		22.88
Field.peas.....	13735	4459.94		32.47	1324.32	631.18		47.66	62.03	56.96		91.83
Haricot beans.....	360260	19065.57		5.29	27540.62	2569.42		9.33	24123.6	10414.28		43.17
Chick-peas.....	633	293.43		46.34	59.06	23.7		40.13	22.23	18.03		81.12
Lentils.....	438	164.83		37.65	30.2	14.96		49.53	0.01	0.01		69.59
Vetch.....	224	211.39		94.18	1.94	1.71		88.16	-	-		-
Soya beans.....	399	295.24		73.94	13.94	10.84		77.77	-	-		-
Fenugreek.....	1117	461.94		41.35	15.93	5.75		36.08	-	-		-
Gibto.....	27	18.88		69.27	0.99	0.77		77.22	-	-		-
Oilseeds.....	10290	3593.33		34.92	1081.21	656.74		60.74	24.13	22.25		92.2
Neug.....	44	43.08		98.85	5.65	5.59		98.85	-	-		-
Linseed.....	528	188.69		35.75	16.35	8.15		49.82	23.69	22.25		93.91
Groundnuts.....	8477	3505.6		41.35	1046.89	656.64		62.72	0.44	0.25		56.28
Sufflower.....	-	-		-	-	-		-	-	-		-
Sesame.....	-	-		-	-	-		-	-	-		-
Rapeseed.....	1242	782.44		62.99	12.31	7.88		64.01	0.01	0.00		85.57

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	1393	309.07		22.18	89.92	24.06		26.76	-	-		-
Cereals.....	1221	286.64		23.47	75.79	21.78		28.73	-	-		-
Teff.....	-	-		-	-	-		-	-	-		-
Barley.....	-	-		-	-	-		-	-	-		-
Wheat.....	-	-		-	-	-		-	-	-		-
Maize.....	607	185.63		30.58	22.51	8.3		36.87	-	-		-
Sorghum.....	687	212.15		30.9	53.28	18.43		34.6	-	-		-
Finger millet.....	-	-		-	-	-		-	-	-		-
Oats/'Aja'.....	-	-		-	-	-		-	-	-		-
Rice.....	-	-		-	-	-		-	-	-		-
Pulses.....	176	86.09		49.04	10.8	8.05		74.57	-	-		-
Horse.beans.....	-	-		-	-	-		-	-	-		-
Field.peas.....	-	-		-	-	-		-	-	-		-
Haricot beans.....	176	86.09		49.04	10.8	8.05		74.57	-	-		-
Chick-peas.....	-	-		-	-	-		-	-	-		-
Lentils.....	-	-		-	-	-		-	-	-		-
Vetch.....	-	-		-	-	-		-	-	-		-
Soya beans.....	-	-		-	-	-		-	-	-		-
Fenugreek.....	-	-		-	-	-		-	-	-		-
Gibto.....	-	-		-	-	-		-	-	-		-
Oilseeds.....	49	34.78		71.7	3.34	2.79		83.58	-	-		-
Neug.....	-	-		-	-	-		-	-	-		-
Linseed.....	-	-		-	-	-		-	-	-		-
Groundnuts.....	49	34.78		71.7	3.34	2.79		83.58	-	-		-
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	2098	535.68		25.53	147.39	44.56		30.24	605.1	444.26		73.42
Cereals.....	2098	535.68		25.53	147.39	44.56		30.24	605.1	444.26		73.42
Teff.....	-	-		-	-	-		-	-	-		-
Barley.....	-	-		-	-	-		-	-	-		-
Wheat.....	-	-		-	-	-		-	-	-		-
Maize.....	1714	492.08		28.7	102.55	36		35.1	190.6	108.43		56.89
Sorghum.....	466	215.26		46.16	44.84	27.74		61.86	414.49	389.78		94.04
Finger millet.....	-	-		-	-	-		-	-	-		-
Oats/'Aja'.....	-	-		-	-	-		-	-	-		-
Rice.....	-	-		-	-	-		-	-	-		-
Pulses.....	-	-		-	-	-		-	-	-		-
Horse.beans/ Faba eans.....	-	-		-	-	-		-	-	-		-
Field.peas.....	-	-		-	-	-		-	-	-		-
Haricot beans.....	-	-		-	-	-		-	-	-		-
Chick-peas.....	-	-		-	-	-		-	-	-		-
Lentils.....	-	-		-	-	-		-	-	-		-
Vetch/Grass Peas.....	-	-		-	-	-		-	-	-		-
Soya beans.....	-	-		-	-	-		-	-	-		-
Fenugreek.....	-	-		-	-	-		-	-	-		-
Gibto.....	-	-		-	-	-		-	-	-		-
Oilseeds.....	-	-		-	-	-		-	-	-		-
Neug.....	-	-		-	-	-		-	-	-		-
Linseed.....	-	-		-	-	-		-	-	-		-
Groundnuts.....	-	-		-	-	-		-	-	-		-
Sufflower.....	-	-		-	-	-		-	-	-		-
Sesame.....	-	-		-	-	-		-	-	-		-
Rapeseed.....	-	-		-	-	-		-	-	-		-

Agricultural Sample Survey of Ethiopia
Area Measurements of Crop fields and / or Other Land use
Belg Season 2003/04 (1996 E.C)

Part I – Identification Particular

1	2	3	4	5	6	7	8
Region	Zone	Wereda	Farmers, Ass.	Enumeration Area	Household ID	Holder ID	Holder's Name

9	10	11	12	13		14			15	16
Parcel No.	Field No.	Field / Land Use Type Temporary crop field = 1 Permanent crop field = 2 Mixed crop field = 3 Other land Use = 4	Serial No.	Crop name / Land Use Type		Quantity of production In local units				If field is under Mixed crop only Percent of area Under each crop type
		Code				Local unit				
					code	name	code	Quantity		
			1							
			2							
			3							

Part II – result of area measurement of crop fields and /or other land use

1		2		3		4	5	
Date of area measurement		Area in square meters		Area in local unit			If no area measurement State the reason	
date	month			Name of Local unit	code	area	Reason	code

Part III – Area Measurements

Side	A-B	B-C	C-	D-	E-	F-	G-
Bearing (0)							
Length (m)							
Side	H-	I-	J-	K-	L-	M-	N-
Bearing (0)							
Length (m)							
Side	O-	P-	Q-	R-	S-	T-	U-
Bearing (0)							
Length (m)							

Part IV – For Vegetables, root crops and permanent crops only

0		1	2		3		4	
This year's productivity compared with that of last year								
		Increase = 1 Same = 2 Decrease = 3	If increase is reported Increment in Percent		If decrease is reported Decrement in percent		Change of percent	
Crop name	Code			%		%		%

Ag.S.S Form 96/8A

Agricultural Sample Survey of Ethiopia
List of Fields Under Temporary Crops and Farm Management Practices
Belg Season 2003/04 (1996 E.C)

Part I – Identification Particular

1	2	3	4	5	6	7	8	9	10	11	12	13
Region	Zone	Wereda	Farmers Association	E.A	Household ID	Holder ID	Holder's Name	Age	Sex M = 1 F = 2	Educational Level Highest grade Completed	Holder's Family Size	Farm Type Crop = 1 Livestock = 2 Both = 3

Part II – List of Fields Under Temporary Crops and Farm management Practice

1	2	2	3	4	5	6
Serial No.		Questions to the Holder	parcel No. / Field No. / Crop Name code	parcel No. / Field No. / Crop Name code	parcel No. / Field No. / Crop Name code	parcel No. / Field No. / Crop Name code
01		Holding Type Owned = 1 Other = 3 Rented = 2				
02		Field Area in Local unit	Local unit / code / area	Local unit / code / area	Local unit / code / area	Local unit / code / area
03		Production in Local Unit	Local unit / code / Prod	Local unit / code / Prod	Local unit / code / Prod	Local unit / code / Prod
03		If Field Under Ext. Package Yes = 1 No. = 2				
04		If Irrigation used Yes = 1 No = 2				
05		Seed Type Improved = 1 Indigenous = 2				
06		For Cereals, Pulses and Oilseeds only if indigenous seed used Quantity in Kilogram	Kilo Gram	Kilo Gram	Kilo Gram	Kilo Gram
07		For Cereals, Pulses and Oilseeds only if improved seed used Quantity in Kilogram	Kilo Gram	Kilo Gram	Kilo Gram	Kilo Gram
08		For Cereals, Pulses and Oilseeds only if improved seed used price	Birr Cents	Birr Cents	Birr Cents	Birr Cents
09		Was there Crop Damage? Yes = 1 No = 2				
10		If there was crop damage Cause of the damage	Cause code	Cause code	Cause code	Cause code
11		Percent of damage				
12		Any measure taken to prevent the damage? Yes = 1 No = 2				
13		Type of measure taken if any Chemical = 1 Both = 3 Non chemical = 2				
14		Type of chemicals used Pesticide = 1 2&3 = 6 Herbicide = 2 All = 7 Anti disease = 3 1&2 = 4 1&3 = 5				
15		Have you used any fertilizer? Yes = 1 No = 2				
16		If yes type of fertilizer Natural = 1 Both = 3 Chemical = 2				
17		If no chemical fertilizer used, reason for not using it	Reason code	Reason code	Reason code	Reason code
18		If chemical fertilizer used, 18.1 type Urea = 1 both = 3 Dap = 2				
		18.2 quantity in kilogram	Kilo Gram	Kilo Gram	Kilo Gram	Kilo Gram
19		If natural fertilizer used type Cow dung = 1 both = 3 Compost = 2 Others = 4				

Ag.S.S Form 96/8B

Agricultural Sample Survey of Ethiopia
List of Fields Under Mixed Crops and Farm Management Practices
Belg Season, 2003/04 (1996 E.C)

Part I – Identification Particular

1	2	3	4	5	6	7	8	9	10	11	12	13
Region	Zone	Wereda	Farmers Association	E.A	Household ID	Holder ID	Holder's Name	Age	Sex M = 1 F = 2	Educational Level Highest grade Completed	Holder's Family Size	Farm Type Crop = 1 Livestock = 2 Both = 3

Part II – List of Fields Under Mixed Crops and Farm management Practice

1		2	3			4		
Serial No.		Questions to the Holder	Parcel no. / Field no. / Crop name / code	Crop name / code	Crop name / code	Parcel no. / Field no. / Crop name / code	Crop name / code	Crop name / code
0	1	Holding Type Owned = 1 Other = 3 Rented = 2						
0	2	Field Area in Local unit	Local unit name / Code / Area			Local unit name / Code / Area		
0	3	Production in Local Units	Local unit name / Code / prod			Local unit name / Code / prod		
0	3	If Field Under Ext. Package Yes = 1 No. = 2						
0	4	Percent of area under each crop by crop type						
0	5	Number of fruit trees (excluding coffee, chat pineapple and sugarcane)						
0	6	Number of fruit bearing trees (excluding coffee, chat pineapple and sugarcane)						
0	7	If Irrigation used Yes = 1 No = 2						
0	8	Seed Type Improved = 1 Indigenous = 2						
0	9	For Cereals, Pulses and Oilseeds only if indigenous seed used Quantity in Kilogram	Kilo Gram	Kilo Gram	Kilo Gram	Kilo Gram	Kilo Gram	Kilo Gram
1	0	For Cereals, Pulses and Oilseeds only if improved seed used Quantity in Kilogram	Kilo Gram	Kilo Gram	Kilo Gram	Kilo Gram	Kilo Gram	Kilo Gram
1	1	For Cereals, Pulses and Oilseeds only if improved seed used price	Birr Cents	Birr Cents	Birr Cents	Birr Cents	Birr Cents	Birr Cents
1	2	Was there Crop Damage? Yes = 1 No = 2						
1	3	If there was crop damage Cause of the damage	Reason code	Reason code	Reason code	Reason code	Reason code	Reason code
1	4	Percent of damage						
1	5	Any measure taken to prevent the damage? Yes = 1 No = 2						
1	6	Type of measure taken if any Chemical = 1 Both = 3 Non chemical = 2						
1	7	Type of chemicals used Pesticide = 1 1&2 = 4 2&3 = 6 Herbicide = 2 1&3 = 5 All = 7 Anti disease = 3						
1	8	Have you used any fertilizer? Yes = 1 No = 2						
1	9	If yes, type of fertilizer used Natural = 1 Both = 3 Chemical = 2						
2	0	If no chemical fertilizer used, reason for not using it	Reason / Code			Reason / Code		
2	1	If chemical fertilizer used, 21.1 type Urea = 1 both = 3 Dap = 2						
		21.2 quantity in kilogram	Kilo Gram			Kilo Gram		
2	2	If natural fertilizer used type Cow dung = 1 both = 3 Compost = 2 Others = 4						