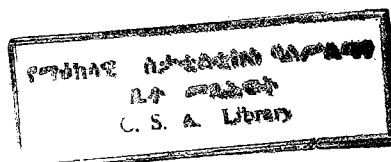


*THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA  
CENTRAL STATISTICAL AUTHORITY*



**AGRICULTURAL SAMPLE SURVEY  
1996/97 (1989 E.C.)**

**VOLUME I**

**REPORT ON**

**AREA AND PRODUCTION FOR  
MAJOR CROPS**

**(PRIVATE PEASANT HOLDINGS, MEHER SEASON)**

*ADDIS ABABA  
APRIL 1997*

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## CONTENTS

1.	INTRODUCTION.....	1
2.	OBJECTIVE OF THE SURVEY.....	2
3.	COVERAGE AND CONTENT.....	2
4.	CONCEPTS AND DEFINITIONS.....	4
5.	SAMPLE DESIGN.....	6
6.	FIELD ORGANIZATION.....	7
7.	TRAINING OF FIELD STAFF.....	8
8.	METHOD OF DATA COLLECTION.....	8
9.	EDITING, CODING AND VERIFICATION.....	9
11.	DATA ENTRY, CLEANING AND PROCESSING.....	9
12.	SUMMARY OF THE SURVEY RESULTS ON AREA AND PRODUCTION.....	10
APPENDIX I-	ESTIMATION PROCEDURE OF TOTAL, RATIO AND SAMPLING ERROR.....	41
APPENDIX II-	STANDARD ERROR AND COEFFICIENT OF VARIATIONS.....	47
APPENDIX III-	.....	55
	- NUMBER OF EAs SAMPLED AND COVERED	
	- NUMBER OF HOUSEHOLDS EXPECTED TO BE COVERED AND ACTUALLY COVERED	
	- NUMBER OF PARCELS AND FIELDS MEASURED	
	- NUMBER OF CROP CUTTINGS CONDUCTE.	

## ABBREVIATIONS

CSA	-	CENTRAL STATISTICAL AUTHORITY
CV	-	COEFFICIENT OF VARIATION
EC	-	ETHIOPIAN CALENDAR
EA	-	ENUMERATION AREA
GDP	-	GROSS DOMESTIC PRODUCT
HA	-	HECTARE
NS	-	NOT STATED
PCs	-	PERSONAL COMPUTERS
PSUs	-	PRIMARY SAMPLING UNITS
QT	-	QUINTAL
SE	-	STANDARD ERROR
SNNPR-		SOUTHERN NATION, NATIONALITIES AND PEOPLES' REGION

**REPORT ON**  
**AREA AND PRODUCTION OF MAJOR CROPS**

**1. INTRODUCTION**

The collection of reliable, comprehensive and timely statistical information on agriculture is very essential for planning purposes and formulation of agricultural policy. Hence, The Central Statistical Authority (CSA) has been conducting Agricultural Sample Surveys on annual basis since 1980/81 (1973 E.C.) to meet some of the statistical data needs of planners and policy makers.

This publication presents the 1996/97(1989 E.C.) Agricultural Sample Survey results on area and production of major crops in the private peasant holdings. The report comprises of sections dealing with the objectives of the 1996/97(1989 E.C.) annual survey; coverage and content of the survey; sample design; field organization; training of field staff ; method of data collection; and survey results on area, production and yield of major crops. Moreover, estimation procedures for area and production of major crops for the year 1996/97(1989 E.C.) are briefly explained in the Appendix I. The standard errors and coefficient of variations for area and production estimates of major crops, number of EAs sampled and covered, number of agricultural households covered, parcels and fields measured and number of crop cuttings conducted are presented in Appendix II and III.

## **2. OBJECTIVES OF THE SURVEY.**

The general objective of the agricultural sample survey was to collect basic quantitative information on the nation's agriculture that are considered essential for development planning and socio-economic policy formulation.

In particular, the objectives of the survey were to estimate the total cultivated land; total production and yield of major crops per hectare; crop land uses (temporary and permanent); quantity and cost of agricultural inputs by type; number of livestock and poultry by type, purpose, sex and age; number of beehives and honey production in the private peasant holdings for the nation, regions and group of zones.

## **3. COVERAGE AND CONTENT.**

The 1996/97 (1989 E.C.) annual agricultural sample survey was designed to cover sedentary rural agricultural population in all regions of the country. Urban and nomadic areas were not included in the survey. Accordingly, a total of 55 zones and 375 weredas were covered by the survey. The areal coverage of the survey is given in *Table a*.

**Table a. AREAL COVERAGE OF THE 1996/97 AGRICULTURAL SAMPLE SURVEY**

REGION	NUMBER OF ZONES			NUMBER OF WEREDAS	
	TOTAL	COVERED BY THE SURVEY	NOT COVERED BY THE SURVEY	PLANNED TO BE COVERED BY THE SURVEY	COVERED BY THE SURVEY
TIGRAY <sup>1</sup>	5	4	1	35	33
AFAR <sup>2</sup>	5	3	2	7	7
AMHARA	10	10	-	95	95
OROMIYA	12	12	-	148	148
SOMALIE <sup>3</sup>	9	3	6	7	6
BENSHANGUL-GUMEZ	3	2	1	7	7
S.N.N.P.R.	16	16	-	68	68
GAMBELA	1	1	-	5	4
HARARI	1	1	-	1	1
A. ABABA <sup>4</sup>	6	2	4	5	5
DIRE DAWA	1	1	-	1	1
<b>TOTAL</b>	<b>69</b>	<b>55</b>	<b>14</b>	<b>379</b>	<b>375</b>

Note

- 1 - In Tigray Region, four out of five zones have rural settled population. In the remaining one zone the entire population is urban residents.
- 2 - Afar region has a total of five zones, but only three zones have significant sedentary rural population.
- 3 - Somalie region has a total of nine zones, however only three zones have significant sedentary rural population.
- 4 - Addis Ababa has a total of six zones, however, only two zones have rural settled population. In the remaining four zones the entire population is urban residents.

S.N.N.P.R = Southern Nations Nationalities and Peoples' Region

Moreover, for the survey a total of 705 Enumeration Areas were selected to be covered in all regions. Nevertheless, 5 of them were closed due to various reasons and the survey succeeded to cover 700 Enumeration Areas(EAs). Furthermore, from each of the selected EAs a sample of 25 agricultural households were selected to represent the agricultural population of the sampled EA.

From these households, information on area under crops, Meher and Belg season production of crops, cropland utilisation, agricultural practices, crop damage, quantity and type of agricultural inputs used, number of livestock and poultry by type, purpose, age and sex, number of beehives by type, honey yield, milk yield butter were collected.

It should be noted here that of the total 25 agricultural households covered in the selected EAs, the data collection on crop cutting was administered only on the last 15 households starting from the 11<sup>th</sup> selected household. Thus, a total of 17,117 agricultural households were covered for these exercises. In addition, area measurements of 78,347 fields in 46,247 parcels with different crops belonging to the 25 households were done for the meher season and 24,571 crop-cutting exercises on major temporary crops in sub-sample of the fields were conducted. For details refer to *Appendix III*.

#### **4. CONCEPTS AND DEFINITIONS.**

In order to standardize the data the same concepts and definitions were applied during data collection. Hence, some of the concepts and definitions used in the survey are given 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 consists of 150 - 200 households.



**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 the help 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 the right to determine the utilization of the products.

**Holding:** a holding is all the land and/or 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.

**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 or unrelated persons, or a combination of both. These persons are taken as members of the household.

**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.

**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 of one or more cadastral units, plots or fields 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.

**Meher(Main) Season Crop:** Any crop harvested from Meskerem (September) to Yekatit (February) is considered as meher season crop.

## **5. SAMPLE DESIGN.**

A two stage stratified sample design was used for the 1996/97 (1989 E.C.) Annual Agricultural Sample Survey. In three regions, namely in Amhara, Oromiya and Southern Nations and Nationalities Peoples' Region, group of contiguous zones were treated as strata/reporting levels of the survey results. In the remaining regions, the reporting levels were the regions themselves. The primary sampling units (PSUs) in all strata were Enumeration Areas (EAs). Agricultural households were the ultimate sampling units. The survey questionnaires were administered to all agricultural holders in the sampled agricultural households.

A fixed number of sample EAs was determined for each stratum/ reporting level based on precision of estimates, household size of the stratum and cost considerations. The overall sample number of EAs in a stratum was proportionately allocated to zones/special weredas within the stratum to their household size. From within each Zone/Special Wereda sample EAs were selected with probability proportional to size, size being the total number of households of EAs as obtained from the 1994 census map work. From each sample EA, 25 agricultural households were sampled systematically without replacement from a fresh list of agricultural households.

All information were collected from these households except for crop-cutting exercise, for which data were collected only from the last 15 agricultural households starting from the 11<sup>th</sup> selected agricultural households. Moreover, holders within these households were enumerated and the required data were collected from these holders.

Estimation procedures of totals and ratios of agricultural variables and the measure of precision of area and production are given in *Appendix I* and *II*.

## **6. FIELD ORGANIZATION.**

CSA branch statistical office heads, field supervisors and enumerators, experts from head office, other support staff and drivers were involved in the operation of the survey.

For all enumerators the necessary survey equipment, such as compasses, protractors, ruler, measuring tapes, balance scales, poles, ropes, sample bags,...etc. were made available and to assist the field work 68 vehicles were put on operation.

## **7. TRAINING OF FIELD STAFF.**

The training program for the field staff was carried out in two stages. In the first stage trainees from the head office, branch statistical office heads and some of the field supervisors were given training for one week at the head office. Some of those trained in the first stage conducted similar training for field supervisors and enumerators for 10 days in all the 15 branch offices all over the country. During the training, the field staff were given detailed class room instruction on the objective and uses of the survey, concept and definitions of terms used, method of area measurement, method of crop cutting, interviewing procedures,... etc. The training sessions included thorough field practices with regard to data collection.

## **8. METHOD OF DATA COLLECTION.**

Survey data were collected on questionnaires both by subjective and objective methods. Information on agricultural practices (application of fertilizer, pesticide, use of improved seed and irrigation), livestock and poultry information were collected subjectively by interviewing the holders in the sampled households.

In addition, the objective measurements, particularly for area measurements, were carried out for the 25 selected households from each sampled EA in which all crop areas were physically measured using compasses and measuring tapes. On the other hand, all fields under temporary crops of each holder in the last 15 sampled households were classified by type of crop and from each type a field was randomly selected for crop cutting. Then, a sixteen meter square plot was demarcated in the selected field in which the crop in the plot was harvested. The harvested crop

was threshed and carried in bag with identification information like name of the crop, holding number, parcel and field number. The crop in the bag was weighed immediately after threshing and weighed again after two weeks of drying. The weights were recorded in the respective questionnaire.

#### **9. EDITING, CODING AND VERIFICATION.**

Intensive training was given to the editors and in due course, regular staff were assigned to answer questions, clear doubts,...etc. so as to facilitate the editing and coding activity. In addition, the edited and coded data were checked by supervisors on 100% basis.

#### **10. DATA ENTRY, CLEANING AND PROCESSING.**

The data was entered in personal computers using IMPS (Integrated Microcomputer Processing System) Software by data encoders. Then, the data entered was checked and cleaned. Finally, the data processing activity was also done by personal computers(PCs) to produce results which were indicated in the tabulation plan.

## 11. SUMMARY OF THE SURVEY RESULTS ON AREA AND PRODUCTION.

The result of area, production and yield for major crops (temporary or annual) are presented in this publication. Consequently, the *total area* under major temporary crops (See *Table b*) is estimated to be about 8.07 million hectares at national level for the meher season of 1996/97 (1989 E.C.).

Out of the total area *cereals* account for about 6.69 million hectares ( 82.86%) while *pulses* and *other crops* like *neug*, *linseed*, *rapeseed*, *ground nuts*, *sunflower*, *sesame* and *fenugreek* shared 0.91million hectares (11.22%) and 0.48 million hectares (5.93%) respectively.

When we look at the specific crop the largest area, i.e. about 2.17 million hectares, is reported for *teff* followed by *sorghum* and *maize* in that order. For details refer to *Table 3*.

**Table b.**                      **Summary of Area, Production and Yield of Major Crops for**  
**Meher Season of the year 1996/97 (1989 E.C.) (Private peasant Holdings)**

TYPE OF CROP	TOTAL AREA		TOTAL PRODUCTION		YIELD(QT/HA)
	MILLION HA	%	MILLION QT.	%	
CEREALS	6.69	82.86	86.29	89.47	12.90
PULSES	0.91	11.22	8.03	8.32	8.87
OTHER CROPS	0.48	5.93	2.13	2.21	4.46
TOTAL	8.07	100.00	96.45	100.00	11.95

Furthermore, the *total production* estimate for private peasant holdings during meher season of 1996/97(1989 E.C.) at national level is about 96.45 million quintals, of which *cereals* account for 86.29 million quintals, *pulses* account for about 8.03 million quintals and *other crops* mentioned above totalled to 2.13 million quintals (See *Table b*).

The survey result also indicates that the yield of *cereals* is 12.90 quintals per hectare, the yield of *pulses* is 8.87 quintals per hectare and the yield of *other crops* mentioned above is 4.46 quintals per hectare. It is also shown in *Table 3* that highest yield is reported for *maize*, which is 19.23 quintals per hectare and the smallest is for *nueg*, 3.33 quintals per hectare.

As presented in *Table 1*, total area cultivated, total production and the average yield per hectare have increased by 1.56%, 3.95% and 2.4% respectively compared to last year. The increase is mainly attributed to favorable condition of the cropping season.

**NOTE**

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. Eventhough 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.

TABLE 1. Estimates of 1995/96 and 1996/97 Area, Production and Yield of Major Crops  
for Private Peasant Holdings in Ethiopia  
Meher Season

CROP	TOTAL AREA('000 HA)			TOTAL PRODUCTION('000 QT.)			YIELD(QT/HA)		
	1995/96 (1988 E.C.)	1996/97 (1989 E.C.)	% CHANGE	1995/96 (1988 E.C.)	1996/97 (1989 E.C.)	% CHANGE	1995/96 (1988 E.C.)	1996/97 (1989 E.C.)	% CHANGE
<b>CBREALS</b>	6,652.55	6,688.56	0.54	82,697.14	86,293.32	4.35	12.43	12.90	3.78
TEFF	2,097.40	2,167.77	3.36	17,523.75	20,018.93	14.24	8.35	9.23	10.54
BARLEY	825.54	697.67	-15.49	8,725.32	7,423.85	-14.92	10.57	10.64	0.66
WHEAT	882.06	772.23	-12.45	10,763.04	10,015.90	-6.94	12.20	12.97	6.31
MAIZE	1,280.68	1,316.87	2.83	25,392.92	25,320.03	-0.29	19.83	19.23	-3.03
SORGHUM	1,252.41	1,399.95	11.78	17,226.52	20,073.46	16.53	13.75	14.34	4.29
MILLET	269.35	290.66	7.91	2,413.42	2,961.65	22.72	8.96	10.19	13.73
OATS	45.11	43.41	-3.77	652.17	479.49	-26.48	14.46	11.05	-23.58
<b>PULSESES</b>	904.39	905.35	0.11	8,141.44	8,026.28	-1.41	9.00	8.86	-1.56
HORSE BEANS	336.72	329.31	-2.20	3,593.67	3,206.76	-10.77	10.67	9.74	-8.72
FIELD PEAS	180.46	158.11	-12.39	1,395.75	1,063.03	-23.84	7.73	6.72	-13.07
HARICOTBEANS	101.17	112.81	11.51	783.61	947.64	20.93	7.75	8.40	8.39
CHICK PEAS	144.97	147.90	2.02	1,232.41	1,264.61	2.61	8.50	8.55	0.59
LENTILS	65.12	52.81	-18.90	331.64	344.87	3.99	5.09	6.43	26.33
VETCH	75.95	104.41	37.47	804.36	1,199.36	49.11	10.59	11.49	8.50
<b>OTHERS</b>	391.57	478.45	22.19	1,952.60	2,132.79	9.23	4.99	4.46	-10.62
NEUG	223.33	250.52	12.17	859.49	834.54	-2.90	3.85	3.33	-13.51
LINSEED	112.72	148.17	31.45	568.38	676.23	18.97	5.04	4.56	-9.52
RAPESEED	14.19	21.40	50.81	**	**	**	**	**	-
GROUND NUTS	13.26	17.43	31.45	**	125.28	-	**	7.19	-
SUFLOWER	4.78	5.17	8.16	**	**	**	**	**	-
SESAME	9.39	18.50	97.02	**	72.76	-	**	3.93	-
FENUGREEK	13.90	17.26	24.17	73.51	100.31	36.46	5.29	5.80	9.64
<b>ALL CROPS</b>	<b>7,948.51</b>	<b>8,072.36</b>	<b>1.56</b>	<b>92,791.18</b>	<b>96,452.39</b>	<b>3.95</b>	<b>11.67</b>	<b>11.95</b>	<b>2.40</b>