

CHAPTER VIII

FARM IMPLEMENTS, DRAUGHT ANIMALS AND STORAGE FACILITIES

1. INTRODUCTION

Agriculture is the single largest sector in the Ethiopian economy. The position of the agricultural sector for the past few decades does not only concern the peasants, but on account of the extent of its inputs, outputs and its function as a largest employer of labour has a profound impact on the entire economy. It is worth to point-out that Ethiopia has large resources in terms of land, agricultural labour, draught animals...etc.

Despite all these facts, the average yield of the main food crops and livestock products attained by private peasant holders is very low and it is not adequate to feed the ever-growing population. Because of such prevailing condition in the agricultural sector, the economy remained at subsistence level. Among the factors that hampered the country not to prosper is the use of primitive farm implements and tools by the peasants to operate their land and to raise livestock.

The role of improved agricultural implements and tools in raising the standard of farming efficiency and increasing average yield of production has been recognized for many years. Land preparation requires modern power source that results in considerable farm efficiency and expansion of production. Seeding and fertilization are among the agricultural operations where animal and tractor drawn machines appear to be capable of greater efficiency than only hand method. Power-driven line sowing and fertilization are more efficient than hand spreading and this is usually expected to result in higher yield for the same amount of fertilizers and seeds.

The traditional unimproved farm implements used by the peasants and the poor condition of the draught animals are considered to be among the main factors that retarded the agricultural productivity in the country. On the other hand, the development of farm implements can also be crippled by small land size holding, abundant labour in rural area and non-availability of adequate access to modern farm implements, which the

private peasant holders can afford to rent or buy. In general, effective development of farm implements and machineries takes place when land is abundant and labour is being rapidly absorbed by non-agricultural sector, (WB, 1984)

Since development programmes are in progress in Ethiopia, data generated from census and sample surveys on different types of agricultural outputs and inputs are necessary for assessments, evaluation and formulation of programmes and policies in the sector. One of the objectives of this census was to provide benchmark data that can help to assess the growth, quantity, quality and value of farm implements and other farm equipment used by the private peasant holders so as to easily identify the implements that are abundant and those that are in short supply. The structural characteristics of these farm implements and other farm equipment do not change much from year to year and such data are usually obtained from a census of agriculture, which is conducted every 5 or 10 years. Data on farm implements and other farm equipment was not collected in Ethiopia and much is not known about the status and growth of these implements. Thus, in the Ethiopian agricultural census conducted in 2001/2002, data was collected on farm implements and other farm equipment. These farm implements include, implements used for clearing land, cultivation, harvesting, threshing and others.

In this census draught animals comprises animals engaged specifically in ploughing, threshing and farm transport facilities. Replacement value was one of the variables covered by this census. Replacement value is the amount it would cost to replace farm implement, equipment, draught animal and storage facilities with those that are similar in terms of origin, age, quality or condition.

In this chapter the classification of farm implements, farm equipment, draught animals and storage facilities are presented in Section 2. Brief discussions of data on Summary Table VIII.1 to VIII.4 are also provided in Section 3. Finally, the estimates, Standard Errors (S.E.) and Coefficients of Variation (C.V.) on number of holders reporting, number of farm implements reported and total value are presented in the Annex Table.

2. CLASSIFICATION OF FARM IMPLEMENTS, OTHER FARM EQUIPMENT AND DRAUGHT ANIMALS

The farm implements and draught animals reported were classified into the following eight groups: -

- Implements used for clearing land,
- Implements used for cultivation,
- Parts for traditional plough,
- Implements used for harvesting,
- Implements used for threshing,
- Other farm equipment,
- Draught animals for farm activity, and
- Storage facilities.

These eight groups further broken down to include the following implements and other farm equipment:

2.1 Implements used for clearing land

- a) Axes,
- b) 'Gejera '(Chopper), and
- c) Shovel.

2.2 Implements used for cultivation

- a) Hoe,
- b) 'Mekeskesha',
- c) Pick-Axe, and
- d) Tractor.

2.3 Parts for traditional plough

- a) 'Deger',
- b) ' Erfe',
- c) Plough-Beam,
- d) Plough-Tip, and
- e) 'Wegel'-Tip.

2.4 Implement used for harvesting

- a) Sickle.

2.5 Implements used for harvesting and threshing

- a) Hay- Fork (metal or wood),
- b) Threshing stick, and
- c) Winnowing (metal or wood).

2.6 Other farm equipment

- a) Cart (hauling),
- b) Sprayer (hand operated),
- c) Sprayer (power operated),
- d) Tying Tool, and
- e) Wheelbarrow.

2.7 Draught animals

- a) Animals deployed specifically in ploughing.
 - Ass/Donkey,
 - Camel,
 - Horse,
 - Mule, and
 - Ox.
- b) Animals deployed in threshing or transportation: -
 - Ass/Donkey,
 - Camel,
 - Cattle (Working Age),
 - Horse, and
 - Mule.

2.8 Storage facilities

- a) 'Debignit'(Local storage),
- b) 'Gottera' (Local storage),
- c) 'Gudguad'(Local storage), and
- d) Modern storage.

Definitions of storage facilities

'Debignit':- Is a round vessel of earthenware storage attached with the wall of a house. The shape of 'Debignit' is similar to the shape of a barrel. Debignit is usually around 1 metre high and 0.5-1metres wide.

'Gottera':- Is a storage made of bamboo plant. The bamboo is split and then crisscrossed and woven like a giant basket. Finally, it is laminated with a mixture of animal dung and dry grass. 'Gottera' is usually about 1-3 metres high and about 1 metre wide.

'Gudguad': - Is an underground storage, which is formed by digging the ground with certain depth and radius. The wall of 'Gudguad' is usually laminated with animal dung.

Modern storage: - Is a storage that has a better quality in protecting grains from humidity and pests than the above mentioned storages.

3. ESTIMATES OF FARM IMPLEMENTS, DRAUGHT ANIMALS AND STORAGE FACILITIES

The type, quality and quantity of tools and implements in use usually indicate the level of farming practice and agricultural development of a country. Hence, the results of this census can give us some highlights to evaluate the farming system in the region. In this report farm implements are grouped in terms of their operation and this can help to make appropriate comparisons.

3.1 Farm Implements and Tools

The data in Summary Table VIII.1 indicates that the number of holders reporting axe was the highest followed by shovel. In Harari Region it is estimated that there were about 13,516 crop holders in rural areas, of which about 12,363 (91.47%) reported to own shovel, about 11,299(83.6%) reporting to own axe. Among the farm implements used for clearing land, the number of observation for shovel was highest, however the total value for axe was the highest followed by shovels. The expected duration of service of implements in years for an axe and shovel was estimated to be 8 and 2, respectively.

One of the labour and power intensive farm activities is cultivation. It comprises digging, ploughing, sowing and weeding. In order to accomplish such operations, the Ethiopian peasants use hoe, 'Mekeskesha', pick-axe, and traditional plough. Among these farm implements and tools hoe was the highest in terms of number of holders reporting, total number of implements reported and total value. The second highest was pick-axe while 'Mekeskesha' was the lowest. The data in Summary Table VIII.4 revealed that the percentage distribution of the number of crop holders in rural areas that owned one, two, three, four and five hoes was 61.36%, 20.09%, 2.38%, 1.10% and 0.47% respectively. It is also shown that sickle is reported as the only harvesting tool. For details, see Summary Table VIII.1.

3.2 Draught Animals

Peasants in Ethiopia use domestic animals for draught purpose. In several parts of the country where holdings are far from residence: asses, horses, mules and camels are used to transport various types of goods and agricultural products from holding to residence and vice-versa. As it is indicated in Summary Table VIII.2 among the domestic animals that are used for ploughing, ox was the highest in terms of number of holders reporting, number of oxen reported and total value which amounted to 4.6 million Birr. About 4,840 holders (35.8% of the total rural crop holders in the region) reported 7,771 cattle (working age cattle) used for threshing and these cattle had a value of over 4.7 million Birr and the average replacement value of a working age cattle was about 385.17 Birr. It was also indicated that asses were used by holders for transportation.

The estimated number and percentage distribution of crop holders in rural areas that owned implements, equipment and draught animals are shown in Summary Table VIII.4. In Harari region the census result shows that there were about 13,516 crop holders in rural areas. Among these 16.88%, 18.13%, and 0.92% holders owned one, two, and three oxen respectively. On the other hand about 64.08% of the holders did not own ox. For details, see Summary Table VIII.4.

3.3 Storage Facilities

One of the methods that minimize post harvest production losses is the usage of modern storage facilities. During the census, data was collected on modern storage facilities and the unimproved local storage facilities such as 'Debignit', 'Gottera' and 'Gudguad'. In this census, building or any structure used as storage facilities and other containers that have better storage quality to protect agricultural products from humidity and pests are considered as modern storage facilities.

The data in Summary Table VIII.3 shows the number of holders reporting storage facilities and number of such facilities. Thus, the data in the table reveals, 'Gudguad' was reported by the highest number of holders. The total value of all reported storage facilities was assessed to be 299,988 Birr, of which 99.1% and 0.86% comprises of 'Gudguad' and Debignit, respectively. The percentage distribution of the number of crop holders that owned 'Gudguad' and 'Debignit' is also presented in Summary Table VIII.4.

SUMMARY TABLE VIII.1:-Number and Percentage of Holders Reporting implements and Other Farm Equipment by type, Quantity Reported, Replacement Value, and Duration of Implement, for Private Holdings

Implements and Equipment	Number of Holders Reporting	Percent of Total Holders	Number of Implements and Equipment		Total Value (Birr)	Average Replacement Value Per Imp. & Eq. (Birr)	Average Duration of Service of Imp. & Eq. (Years)
			Total Reported	# Average Per Holder			
Used for Clearing Land							
Axes	11,299	83.60	17,726	1.31	183,991	6.42	8
'Gejeras' (Choppers).....	*	-	*	*	*	*	*
Shovels	12,363	91.47	18,591	1.38	147,649	5.12	2
Used for Cultivation							
Hoes	11,533	85.33	15,571	1.15	240,044	11.09	5
'Meakeshesas'	192	1.42	192	0.01	*	*	*
Pick-Axes	401	2.97	529	0.04	6,878	9.14	7
Tractors	-	-	-	-	-	-	-
Parts for traditional Plough							
'Degers'	4,739	35.06	14,232	1.05	28,070	0.95	2
'Erfes'	4,651	34.41	5,578	0.41	16,096	2.41	2
Plough-Beams	4,937	36.53	5,192	0.38	72,479	13.03	5
Plough-Tips	5,714	42.28	7,756	0.57	71,976	6.39	3
'Wegel'-Tips	4,726	34.97	6,105	0.45	23,804	3.13	3
Yokes	5,075	37.55	5,231	0.39	61,891	11.26	5
Used for Harvesting							
Sickles	6,666	49.32	8,258	0.61	70,298	7.01	6
Used for Threshing							
Hay-Forks (metal)	665	4.92	689	0.05	8,914	12.46	10
Hay-Forks (wood)	3,260	24.12	3,496	0.26	13,678	3.63	4
Threshing Sticks	6,241	46.17	10,538	0.78	24,568	1.59	2
Winnowers (metal)	*	-	*	*	*	*	*
Winnowers (wood)	2,768	20.48	3,427	0.25	28,403	6.37	7
Other farm Equipment							
Carts	*	-	*	*	*	*	*
Sprayers (Hand operated)	403	2.98	403	0.03	67,409	167.27	8
Sprayers (Power operated)	-	-	-	-	-	-	-
Tying Tools	-	-	-	-	-	-	-
Wheelbarrows	397	2.94	397	0.03	42,714	107.59	7

Average per holder is the ratio of total number of each implement reported to total number of crop holders in rural areas in the region.

- Total number of crop holders comprises, holders participated in crop production only and both crop production and livestock rearing.

SUMMARY TABLE VIII.2:-Number and Percentage of Holders Reporting Draught Animals, Quantity Reported, Replacement Value, and Average Age of Animal, for Private Holdings

Animals	Number of Holders Reporting	Percent of Total Holders	Number of Animals		Total Value of Animals (Birr)	Average Replacement Value Per Animal (Birr)	Average Age of Animal (Years)
			Total Reported	# Average Per Holder			
Used for Ploughing							
Asses.....	*	-	*	*	*	*	*
Camels.....	-	-	-	-	-	-	-
Horses.....	-	-	-	-	-	-	-
Mules.....	-	-	-	-	-	-	-
Oxen.....	4,855	35.92	7,554	0.56	4,692,484	401.36	4
Used for Threshing or Transportation							
Asses.....	4,174	30.88	4,554	0.34	1,191,515	240.01	9
Camels.....	*	-	*	*	*	*	*
Cattle.....	4,840	35.81	7,771	0.57	4,793,856	385.17	4
Horses.....	-	-	-	-	-	-	-
Mules.....	-	-	-	-	-	-	-

Average per holder is the ratio of total number of each draught animal reported to total number of crop holders in rural areas in the region.

- Total number of crop holders comprises, holders participated in crop production only and both crop production and livestock rearing.

SUMMARY TABLE VIII.3: - Number and Percentage of Holders Reporting Storage facilities, Quantity Reported, Replacement Value, and Storage Capacity, for Private Holdings.

Storage Structure	Number of Holders Reporting	Percent of Total Storage Holders	Number of Storages		Total Value of Storages (Birr)	Average Replacement Value Per Storage (Birr)	Average Storage Capacity Per Storage (Quintal)
			Total Reported	# Average Per Holder			
'Debignits'.....	196	1.45	256	0.02	2,597	8.85	7
'Gotteras'.....	-	-	-	-	-	-	-
'Gudguads'.....	7,390	54.68	7,711	0.57	297,391	37.15	8
Modern Storage Structures...	-	-	-	-	-	-	-

Average per holder is the ratio of total number of each storage structure reported to total number of crop holders in rural areas in the region.

- Total number of crop holders comprises, holders participated in crop production only and both crop production and livestock rearing.

SUMMARY TABLE VIII.4:-Number of Crop Holders that Owned Farm Implement, Equipment and Draught Animals.

Name of Implement Equipment Draught Animal	Number of Crop holders that owned											
	No Implement, Equipment, or Draught Animal		One Implement, Equipment, and Draught Animal		Two Implements, Equipment, and Draught Animals		Three Implements, Equipment, and Draught Animals		Four Implements, Equipment, and Draught Animals		Five and above Implements, Equipment, and Draught Animals	
	Holders	%	Holders	%	Holders	%	Holders	%	Holders	%	Holders	%
Used for Clearing Land												
Axes	2,217	16.40	6,804	50.34	3,208	23.73	969	7.17	123	0.91	195	1.44
'Gejera'	13,396	99.11	120	0.89	-	-	-	-	-	-	-	-
Shovel	1,152	8.52	7,631	56.46	3,646	26.98	738	5.46	286	2.12	63	0.47
Used for Cultivation												
Hoes	1,983	14.67	8,293	61.36	2,715	20.09	322	2.38	149	1.10	54	0.40
'Meakeshas'	13,324	98.58	192	1.42	-	-	-	-	-	-	-	-
Pick- Axes	13,115	97.03	301	2.23	72	0.53	28	0.21	-	-	-	-
Tractors	13,516	100.00	-	-	-	-	-	-	-	-	-	-
Parts for traditional Plough												
'Degers'	8,778	64.95	1,638	12.12	1,034	7.65	244	1.81	831	6.15	991	7.33
'Erfer' (Handle)	8,865	65.59	3,837	28.39	716	5.30	81	0.60	17	0.13	-	-
Plough-Beam	8,579	63.47	4,698	34.76	222	1.64	17	0.13	-	-	-	-
Plough -Tips	7,803	57.73	4,028	29.80	1,459	10.79	128	0.95	82	0.61	16	0.12
'Wegel' -Tips	8,790	65.03	3,752	27.76	648	4.79	247	1.83	79	0.58	-	-
Yokes	8,442	62.46	4,918	36.39	156	1.15	-	-	-	-	-	-
Used for Harvesting												
Sickles	6,851	50.69	5,454	40.35	1,014	7.50	138	1.02	26	0.19	33	0.24
Used for Threshing												
Hay-Forks (Metal)	12,851	95.08	642	4.75	23	0.17	-	-	-	-	-	-
Hay-Forks (Wood)	10,256	75.88	3,069	22.71	160	1.18	18	0.13	13	0.10	-	-
Threshing Sticks	7,275	53.83	4,020	29.74	1,142	8.45	497	3.68	373	2.76	209	1.55
Winnowers (Metal)	13,468	99.64	48	0.36	-	-	-	-	-	-	-	-
Winnowers (Wood)	10,748	79.52	2,142	15.85	610	4.51	-	-	16	0.12	-	-
Other Farm Equipment												
Carts	13,468	99.64	31	0.23	-	-	17	0.13	-	-	-	-
Sprayers (Hand Operated)	13,113	97.02	403	2.98	-	-	-	-	-	-	-	-
Sprayers (Power Operated)	13,516	100.00	-	-	-	-	-	-	-	-	-	-
Tying Tools	13,516	100.00	-	-	-	-	-	-	-	-	-	-
Wheelbarrows	13,119	97.06	397	2.94	-	-	-	-	-	-	-	-
Animals Used for Ploughing												
Asses	13,516	100.00	*	-	*	-	*	-	-	-	-	-
Camels	13,516	100.00	-	-	-	-	-	-	-	-	-	-
Horses	13,516	100.00	-	-	-	-	-	-	-	-	-	-
Mules	13,516	100.00	-	-	-	-	-	-	-	-	-	-
Oxen	8,661	64.08	2,281	16.88	2,450	18.13	124	0.92	-	-	-	-
AnimalsUsed for Threshing or Transportation												
Asses	13,493	99.83	-	-	23	0.17	-	-	-	-	-	-
Camels	13,432	99.38	84	0.62	-	-	-	-	-	-	-	-
Cattle	8,676	64.19	2,130	15.76	2,503	18.52	194	1.44	13	0.10	-	-
Horses	13,516	100.00	-	-	-	-	-	-	-	-	-	-
Mules	13,516	100.00	-	-	-	-	-	-	-	-	-	-
Storage Structure												
'Debignits'	13,320	98.55	166	1.23	-	-	30	0.22	-	-	-	-
'Gotteras'	13,516	100.00	-	-	-	-	-	-	-	-	-	-
'Gudguads'	6,127	45.33	7,090	52.46	278	2.06	21	0.16	-	-	-	-
Modern Storages	13,516	100.00	-	-	-	-	-	-	-	-	-	-

ANNEX TABLES PRESENTING
ESTIMATES, STANDARD ERRORS AND
COEFFICIENT OF VARIATION
FOR SELECTED FARM IMPLEMENT VARIABLES

Annex Tables 8.1

