

**Role of agricultural cooperatives and storage in rural Ethiopia:
Results of two surveys**

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1. Introduction

This report discusses the role of cooperatives and crop storage in rural Ethiopia. It is based on two surveys, the 2008 Ethiopian Agricultural Household Marketing Survey (EAHMS) and the 2012 Cooperative Storage Survey.

1.1. Background

Grain prices in Ethiopia are more volatile than international grain prices, and appear to have become more volatile since the global food crisis of 2007-08. Fluctuations in grain prices cause problems for farmers and consumers in Ethiopia, particularly poor households where grains represent a large share of the family budget. The government recognizes the hardship caused by grain price volatility and is exploring several options to reduce price volatility.

In order to ease grain price volatility, it is important to start with an understanding of the causes of fluctuations in grain prices. In Ethiopia, volatility is caused by several factors, the most significant causes are:

- annual variation in the size of the grain harvest,
- seasonal variation in availability, and
- changes in international grain markets.

This report focuses on efforts to reduce seasonal grain price volatility by increasing the volume of grains put into storage at harvest. One problem is that many farmers are forced to sell their grain immediately after harvest because either they lack storage capacity or they need the cash to pay for school fees and other expenses. In the off-season, the relative scarcity of grains results in higher prices. Many farmers are forced to purchase grain during this period if their own stocks have been depleted.

Efforts to increase the volume of grains stored (rather than sold) at harvest would in principle reduce the harvest glut and support prices during this time. This would also help make more grain available in the off-season and dampen the peak in off-season prices. One approach to encourage grain storage is to help agricultural cooperatives play a more active role in storing and marketing grains. However, the feasibility of this strategy depends on several factors:

- Cooperatives must have sufficient storage capacity to handle grain storage.
- Cooperatives need to have the financial capacity to pay farmers at harvest and sell the grain later in the season, and
- Cooperatives need to have the technical and managerial capacity to set prices, maintain the stocks, and decide on the timing of sales.
- Grain storage must be profitable, meaning that the rise in grain prices must be large enough to cover the full costs of storage. If grain storage is not profitable, a cooperative will either deplete their own financial resources or they will not be able to repay loans they received to finance the storage.

The International Food Policy Research Institute (IFPRI) is carrying out three related studies to provide information that will help the government design policies to reduce seasonal price volatility in grain markets:

- an analysis of the cooperative and storage data from the 2008 Ethiopia Agricultural Household Marketing Survey,
- a Cooperative Storage Survey covering cooperative unions and primary cooperatives,
- the 2012 ATA Baseline Survey, which focuses on agricultural households but also includes a short cooperative questionnaire.

This report provides the results of the first two components of this study.

1.2. Objectives

This report has five main objectives:

- Outline the role of agricultural cooperatives in the lives of Ethiopian farmers,
- Estimate the storage capacity of farmers and cooperatives,
- Describe the main characteristics of crop storage facilities of farmers and cooperatives,
- Review the storage behaviour of farmers and cooperatives, including the crops stored, the volumes held, and the duration of storage, and
- Explore the attitudes and perceptions of farmers regarding crop storage, cooperatives, and agricultural markets in general.

This information should help paint a picture for the government and the ATA of the patterns of crop storage by farmers and by cooperatives, which will be useful in designing interventions to expand grain storage and reduce seasonal price volatility.

The report is organized into six sections. Section 2 summarizes the methods used to collect the data (more detailed information is provided in the annex). Section 3 describes the role of cooperatives in the agricultural activities of farm households. Section 4 summarizes farm-level and cooperative storage in terms of capacity, characteristics, and use of the storage facilities. Section 5 discusses farmer perceptions of agricultural markets and public services. And Section 6 summarizes the results and draws some conclusions.

2. Methods

As described above, this report is based on two sources of information, a 2008 farm survey and a 2012 cooperative survey. Each survey is described below.

2.1. Ethiopian Agricultural Household Marketing Survey

The Joint Research Centre of the European Commission funded the 2008 Ethiopian Agricultural Marketing Household Survey (EAMHS) The International Food Policy Research Institute (IFPRI) along with the Ethiopian Development Research Institute (EDRI) and the Ethiopian Institute for Agricultural Research (EIAR) implemented the EAMHS. It is based on a 16-page questionnaire covering household characteristics, housing, assets, land use, crop production, agricultural input use, crop storage, crop marketing, livestock production, non-farm income, credit, consumption patterns, and perception of changes.

The sample includes 1707 households in the four main regions of Ethiopia: Tigray, Amhara, Oromia, and the Southern Nations, Nationalities, and People's Region (SNNP). These four regions account for about 97% of cereal production in Ethiopia. Excluded are three urban regions (Addis Ababa, Dire Dawa, and Harari), two sparsely populated semi-arid regions (Afar and Somali), and two relatively small regions (Gambela and Benishangul-Gumuz) with less than one million inhabitants.

Researchers, with the help of the Central Statistical Authority (CSA), selected the sample, which is the result of a three-stage stratified random cluster sampling process. In the first stage, rural woredas were randomly selected from each region; in the second, enumeration areas and peasant associations (kebele) were randomly selected from these woredas; and in the third stage, households were randomly selected from household lists (see Table 1).

In February 2008, IFPRI staff trained 25 enumerators and four supervisors over a seven-day period. The training included field testing of the questionnaire and numerous revisions of the questionnaire. Four teams of enumerators carried out the data collection from March-May 2008.

The data entry was done using CS-Pro, a software package designed specifically for data entry of survey and census data. The data entry program was designed to check the data for numbers that were out-of-range or inconsistent with other entered data.

The analysis was carried out using Stata, a software package used widely for analysis of household survey data. Preliminary results of the survey, based on partially-cleaned and unweighted data, were presented at a workshop in Addis Ababa in June 2008. The results presented in this report are based on the cleaned data and make use of sampling weights.

Table 1. Regional distribution of farm households in the sample of the 2008 Ethiopian Agricultural Household Marketing Survey

Region	Number of woredas in sample	Number of Peasant Associations in sample	Number of households in sample	Percentage of all households in sample
Tigray	8	16	385	22.5
Amhara	18	18	433	25.4
Oromia	17	17	408	23.9
SNNP	20	20	481	28.2
Total	63	71	1707	100.0

Source: 2008 Ethiopian Agricultural Household Marketing Survey.

2.2. Cooperative storage survey

The 2012 Cooperative Storage Survey collected information from a random sample of 217 primary cooperatives and 32 cooperative unions. In order to meet an urgent need for information on cooperative storage capacity, the survey was carried out through phone interviews in July and August 2012.

The sample was based on a stratified two-stage sampling process. In the first stage, eight cooperative unions, involved in crop marketing and/or agricultural input distribution, were randomly selected from each of the four main regions in Ethiopia. A complete list of cooperative unions from a March 2012 report by the Federal Cooperative Agency (FCA) was used as the sampling frame.

Table 2. Regional distribution of agricultural cooperatives in the sample of the 2012 Cooperative Storage Survey

Region	Total number of unions	Number of unions in the sample	Total number of primary cooperatives affiliated with unions in the sample			Number of primary cooperatives in the sample
			Members	Non-members	Total	
Tigray	31	8	102	56	158	56
Amhara	26	8	359	201	560	54
Oromiya	56	8	382	378	760	51
SNNP	24	8	296	93	389	56
Total	137	32	1193	728	1867	217

Source: FCA (2012) and analysis of 2012 IFPRI-ATA Cooperative Storage Survey

In the second stage, researchers contacted the selected cooperative unions and requested a list of the primary cooperatives in their area of operation, including members and non-members. From

this list, seven primary cooperatives were selected from each list provided by a union. Because researchers were unable to contact a few primary cooperatives, the final sample was 217 primary cooperatives rather than 224.

A two-page questionnaire was administered to a leader of the cooperative union, while a different two-page questionnaire was used to guide the interviews with the leaders of the primary cooperatives. Two enumerators were hired to administer the survey by phone. The data on completed questionnaires was then entered into a computer.

The results presented below are the estimates using sampling weights; so the results can be considered representative of the cooperatives in the four main regions of Ethiopia. The purpose of sampling weights is to offset the fact that some regions were over-sampled relative to other regions. For example, one-third of the SNNP cooperative unions were selected, but just one-seventh of those in Oromiya were selected. Unweighted averages would give the results from SNNP and Oromiya equal weight because eight unions were interviewed in each, but the weighted averages provides more weight to the results from Oromiya, reflecting the larger number of unions in that region.

3. Role of cooperatives

This section discusses the role of agricultural cooperatives in the lives of agricultural households in the four main regions of Ethiopia. It covers cooperative membership, the use of cooperative services, the role of cooperatives in agricultural marketing, and their role in providing credit, both in cash and in kind. This section is based on the 2008 Ethiopia Agricultural Household Marketing Survey.

3.1. Cooperative membership

The questionnaire asked if anyone in the household was a member of an agricultural cooperative. Overall, 36% of the households reported having at least one member of an agricultural cooperative. As shown in Table 3, cooperative membership is more widespread in Amhara (54% of farm households) than in the other three regions (21-33%). In addition, male-headed households are more likely to be members of an agricultural cooperative than female-headed household (see Table 3).

We created farm-size categories by dividing farm households into roughly equal-sized groups depending on the area of their agricultural land. The results show that larger farmers are more likely to be members of an agricultural cooperative than smaller farmers. Almost half of those with more than 1.75 hectares were members, compared to just 20% of those with less than 0.8 hectares. This is not surprising given that larger farmers are more likely to need cooperative services, such as distribution of chemical fertilizer and marketing of crops than smaller farmers are.

Finally, the results show that more educated farmers are more likely to be members of an agricultural cooperative. For example, 45% of the households where the head can write are members of an agricultural cooperative, but just 29% of households where the head cannot write are members (see Table 3).

A statistical analysis¹ reveals that membership in an agricultural cooperative is much more likely if a farm household is male-headed, has a literate head, has a relatively large farm, and is located in Amhara region. In other words, each of these factors has a statistically significant effect on the probability of a household obtaining membership with an agricultural cooperative, even when accounting for the other factors.

¹ This is based on a probit regression analysis, in which the dependent variable is membership in an agricultural cooperative and the independent variables are various characteristics of the farm and households. All coefficients mentioned were statistically significant at the 1% level.

Table 3. Households having a member of an agricultural cooperative

Region	Distribution of all households	Percentage of household with a cooperative member
Region		
Tigray	8	33
Amhara	28	54
Oromiya	45	31
SNNP	19	21
Total	100	36
Sex of head		
Male	92	37
Female	8	23
Total	100	36
Size of farm		
Less than 0.9 ha	33	20
0.9 to 1.75 ha	36	42
Over 1.75 ha	31	48
Total	100	36
Literacy of head		
Can write	39	45
Cannot write	61	29
Total	100	36

Source: Analysis of data from 2008 EAMHS.

3.2. Use of cooperative services

The survey asked members of agricultural cooperatives which cooperative services they used. About 28% of the members of agricultural cooperatives sell grain through their cooperative. This percentage varies widely across regions and types of households. For example, 38% of cooperative members in Amhara sell grain through their cooperative, but only 8% of cooperative members in Tigray do so. Not only are agricultural households in Amhara more likely to be members of an agricultural cooperative, but among members, a larger share of them sell their grains through the cooperative (see Table 4).

Among members of a cooperative, a slightly higher share of male-headed households sells through the cooperative than female-headed households. . Although female-headed households are much less likely to sell through a cooperative, this is mostly the result of differences in cooperative membership and not differences in the use of this service among cooperative members.

And larger-scale farmers (those with more than 1.75 hectares of land) are more likely to sell their crops through a cooperative than smaller farmers with less than 0.9 hectares. This is not surprising given that larger farmers are more likely to have a grain surplus to sell.

With regard to the sale of other (non-grain) crops through cooperative, the patterns are similar. Overall, 28% of cooperative members sell non-grain crops through the cooperative. Amhara cooperative members are most likely to sell other crops through the cooperative, while those from Tigray are least likely to. Again, the share of male- and female-headed households selling through the cooperative is similar, though in this case female-headed households are somewhat more likely. And larger farms are more likely to sell non-grain crops through their cooperatives than smaller farms.

Table 4. Percentage of cooperative members that use each type of cooperative service

	Sells grain through cooperative	Sells other crops through cooperative	Buys fertilizer through cooperative	Buys other inputs through cooperative	Has received credit through the cooperative	Receives consumer goods from cooperative
Region						
Tigray	8	11	84	85	80	65
Amhara	38	37	92	79	64	36
Oromiya	25	25	82	68	50	4
SNNP	19	17	70	43	44	6
Sex of head						
Male	29	28	85	71	58	23
Female	24	31	87	74	36	19
Farm size						
< 0.9 ha	16	21	79	57	56	15
0.9-1.75 ha	24	25	87	75	57	26
> 1.75 ha	38	34	86	73	57	21
Total	28	28	85	71	57	22

Source: Analysis of data from 2008 EAMHS

Table 4 confirms that cooperative members rely on fertilizer distribution much more than other services. A large majority of cooperative members (85%) buy fertilizer through their cooperative. There is some regional variation in this percentage, but even in SNNP, 70% of cooperative members buy fertilizer through the cooperative. There is not much difference between male- and female-headed households in terms of their use of this service. Larger farms are somewhat more likely to buy fertilizer from their cooperative, but even among the smallest farmers, more than three-quarters buy fertilizer from the cooperative.

The patterns in the purchase of other inputs by cooperative members are quite similar. Overall, 71% of cooperative members buy other inputs from or through the cooperative. Interestingly, cooperative members in Tigray are more likely to buy inputs other than fertilizer than are cooperative members from the other three regions (see Table 4).

Overall, 57% of cooperative members have received credit from the cooperative at least once in the past. This presumably includes receiving fertilizer and other inputs on credit. Cooperative members in Tigray are the most likely to have received credit from their cooperative (80%), while members in SNNP are the least likely to have done so (44%). Unlike crop marketing and input purchases, there is a substantial difference in access to credit from cooperatives between male-headed and female-headed households. While 58% of male-headed households that are members of a cooperative have received credit from the cooperative, this is true of just 36% of female-headed households. Somewhat surprisingly, small-scale farmers who are members are just as likely to have received credit as larger-scale farmers who are members (see Table 4).

The figures presented above refer to the share of cooperative members that use different cooperative services. If we assume that only cooperative members can use these services, we can estimate the share of all agricultural households that use these services. This would imply that about 10% of agricultural households sell grain through a cooperative, 31% buy fertilizer through a cooperative, and 26% obtain other inputs through a cooperative. However, agricultural cooperatives do provide some services to non-members. Thus, these estimates should be considered a lower bound on the share of all agricultural households making use of these cooperative services.

3.3. Role of cooperatives in crop marketing

Agricultural market patterns

In addition to the questions about membership and use of cooperative services, the 2008 EAMHS asked questions about crop production and marketing patterns. The results indicate that a relatively small share of cereals was marketed, varying from 11% for finger millet to 31% for teff for the 2007

Table 5. Total production and sales by crop

Crop	Production in 2006-07 Meher and 2007 Belg (1000 tons)	Sales in 2006-07 Meher and 2007 Belg (1000 tons)	Marketed share (%)	Production in 2007 Belg and 2007-08 Meher (1000 tons)	Sales in 2007 Belg and 2007-08 Meher (1000 tons)
Teff	2,286	714	31%	2,121	662
Barley	1,052	146	14%	829	115
Wheat	2,060	547	27%	1,670	443
Maize	3,766	802	21%	3,581	763
Sorghum	1,905	409	21%	1,539	330
Finger millet	484	52	11%	385	41
Faba bean	458	119	26%	438	114
Field peas	227	83	37%	200	73
Haricot beans	263	93	35%	267	94
Chick-peas	270	119	44%	253	112
Other pulses	200	104	52%	222	115
Oilseeds	300	268	89%	183	163
Vegetables	331	134	41%	333	137
Onion	386	328	85%	438	372
Potato	984	346	35%	1,093	384
Sweet potato	238	37	16%	211	33
Other root crops	260	141	54%	259	140
Fruit	139	83	61%	173	106
Chat	378	262	72%	310	223
Coffee	314	234	74%	299	221
Enset	812	73	9%	819	74
Other crops	691	299	43%	743	322

Sources: Estimated from the 2008 IFPRI-EDRI EAMHS survey. The last column is based on the assumption that the marketed surplus in the 2007-08 Meher season was the same as in the previous Meher.

marketing year. The marketed share of pulses was somewhat higher, ranging from 26% to 52%. The percentage of production marketed was particularly high for oilseeds, coffee, chat, and onions (72 to 89%), implying that these crops are primarily grown for cash income. In contrast, estimates show that farmers sold just 9% of the enset harvest indicating that it is primarily a subsistence crop (see Table 5).

Applying the marketed surplus ratios from 2007 to 2008, we estimate that the marketed volume of maize in 2008 was 763 thousand tons. Although the volume teff produced was much lower than that of maize, the volume of teff marketed in 2008 was only slightly less than that of maize, at 662 thousand tons. By contrast, the volumes of wheat and sorghum available on the market were significantly less, 443 thousand tons and 330 thousand tons, respectively. Across these four main

cereals grown in Ethiopia, the marketed surplus was about 2.5 million tons in 2007 and 2.2 million tons in 2008 (see Table 5).

Location of sale and type of buyer

The EAMHS also collected information on the characteristics of crop sales, such as the location of the transaction and the type of buyer. The results indicate that a large majority of crop sales transactions (88%) occur at the local market place (see Table 6). This percentage is somewhat higher in Tigray and Amhara (95%) and somewhat lower in Oromia (83%). Most of the remaining sales transactions took place at the home or farm of the respondent. Sales at the cooperative centre were quite rare, accounting for just 1% of the crop sales transactions.

Table 6. Location of crop sale (percentage of sales transactions)

	Tigray	Amhara	Oromia	SNNP	Total
On farm/home	4	2	14	7	8
Local market	95	95	83	88	88
Roadside	0	1	1	4	1
Cooperative	1	2	1	1	1
Other	0	1	1	1	1
Total	100	100	100	100	100

Source: Analysis of the 2008 IFPRI-EDRI EAMHS survey.

According to Table 7, more than three-quarters of all crop sales transactions involve sales to a trader. Another 18% are sales to a consumer. This often occurs when farmers take their harvest to a market and set up a selling point, where consumers can come to purchase the product. Sales to (or through) cooperatives are relatively rare, accounting for just 1% of sales transactions.

Table 7. Type of crop buyer (percentage of sales transactions)

	Tigray	Amhara	Oromia	SNNP	Total
Farmer	0	2	1	1	1
Trader	59	75	82	76	77
Processor	22	1	0	1	2
Cooperative	2	2	1	1	1
EGTE/Govt	0	0	0	0	0
Consumer	16	20	15	22	18
Other	0	0	0	0	0
Total	100	100	100	100	100

Source: Analysis of the 2008 IFPRI-EDRI EAMHS survey.

It is worth noting that Section 3.2 and Table 6 do not necessarily contradict each other. In Section 3.2, we noted that at least 10% of agricultural households normally sell some crops through a cooperative, but it does not indicate how much of each household's harvest is sold through the cooperative.

Share of household selling crops through agricultural cooperatives

Toward the end of the interview, respondents were asked whether they sold cereals through a cooperative. Unlike the results presented in Table 4, this question was asked of all household, not just cooperative members. As shown in Table 8, about 7% of farm households report selling cereals through an agricultural cooperative. The percentage varies by region, being somewhat higher in Amhara (10%) and lowest in Tigray (2%). There are only modest differences between male- and female-headed households, and, if anything, female-headed households seem slightly more likely to sell crops through an agricultural cooperative. And, not surprisingly, larger farms (those with more than 1.75 hectares) tend to be more likely to sell crops through an agricultural cooperative than smaller farms (those with less than 0.9 hectares).

Table 8. Percentage of households selling cereals through cooperatives

Region	
Tigray	2
Amhara	11
Oromiya	6
SNNP	5
Sex of head	
Male	6
Female	8
Farm size	
Less than 0.9 ha	4
0.9 to 1.75 ha	6
More than 1.75 ha	10
Total	7

Source: Analysis of the 2008 IFPRI-EDRI EAMHS survey.

Share of the harvest sold through agricultural cooperatives

Farmers who sell cereals through the cooperative may decide not to sell their entire marketed surplus through the cooperative. In the survey, we asked those household that sold cereals through a cooperative what proportion of their sales were marketed by the cooperative. The results, shown in Table 9, indicate that two-thirds of the farmers who sell cereals to the cooperative sell less than half of their marketed surplus through the cooperative. Only 7% sell their entire marketed surplus through the cooperative. This helps to explain the apparent contradiction between the fact that 7% of households sell cereals through cooperatives, yet just 1% of sale transactions are at or with an agricultural cooperative (see Table 9).

Table 9. Share of cereal sales marketed by cooperative among those selling to cooperatives

Share of cereal sales sold through cooperatives	Percent of households
All the sales	7
Most	7
About half	20
Less than half	44
Just a little	23
Total	100

Source: Analysis of the 2008 IFPRI-EDRI EAMHS survey.

Reasons for selling or not selling crops through agricultural cooperatives

Those households that sold cereals through cooperatives were asked the main reasons for doing so. The main reasons were to get the dividend (46%), because the cooperative offers a good price (30%), and to repay a credit owed to the cooperative (19%).

Respondents that did not sell cereals through the cooperative were asked for the reasons they decided not to (we have excluded from the analysis those households that did not sell any cereals). As shown in Table 10, over half of the farm households that sold cereals but did not sell through an agricultural cooperative reported that the cooperative would not buy the harvest. Other reasons given include the distance from the house to the cooperative (19%); the cooperatives were not offering a good price (9%); and that there was no cooperative in the area (9%). About 7% of the respondents gave other reasons for not selling through cooperatives, including that the household is not a member of the cooperative, that the cooperative was new or not functional, that the cooperative did not want to buy small amounts, or that they have an established relationship with a trader.

Table 10. Reasons that farm households do not sell cereals to agricultural cooperatives

Reason	Percentage of households
Cooperative would not buy harvest	54
Cooperative not near farm	19
Price is not good enough	9
No cooperative	9
Cooperative doesn't pay quickly	2
Other	7
Total	100

Source: Analysis of the 2008 IFPRI-EDRI EAMHS survey.

3.4. Role of cooperatives in providing credit

One section of the EAMHS questionnaire focused on access to credit, including both cash loans and in-kind credit. During the previous year (2007), 26% of the households had requested or applied for a cash loan of at least 100 birr. Almost all of these households (99%) received a loan. This may

indicate that households did not apply or request a loan unless they had some confidence that they would receive it. It may also reflect an under-reporting of unsuccessful attempts to obtain a loan.

Of the loans requested, the most common sources were micro-financial institutions (MFIs) — accounting for 38% of the requests— relatives, credit associations, and friends. Cooperatives represented about 4% of the loans requested. Since only 26% of the respondents received a cash loan of more than 100 birr, this implies that about 1% of farm households received a cash-loan from a cooperative in the year before the interview. It should be noted that “credit association” probably includes a number of credit cooperatives, while “cooperative” was probably interpreted as a multi-purpose or agricultural cooperative.

Because of the small number of loans reported from a cooperative (26), the results regarding the terms and conditions of these loans are not be reliable. However, a majority of these loans were for livestock production and had relatively long terms of over 12 months. The average value of the loans obtained from cooperatives was 1,580 birr.

Table 11. Sources of cash loans received

Organization	Percentage of loans requested
MFI	38
Relatives	20
Credit Association	16
Friends	12
Money lender/Arata	4
Cooperative	4
Others	2
Iquib	1
Endir	1
Kebele	0
NGO	0
PSNP	0
Bank	0
Min. of Agriculture	0

Source: Analysis of the 2008 IFPRI-EDRI EAMHS survey. .

Cooperatives play a more significant role in providing agricultural inputs on credit. . Table 12 shows the percentage of different types of farm households that received agricultural inputs on credit from any source in 2007. Overall, about 21% of the households reported receiving inputs on credit. There is some modest variation by region, with a larger share of farmers in Oromiya and Amhara receiving inputs on credit than in SNNP and Tigray. In addition, male-headed households were somewhat more likely to receive inputs on credit (21%) compared to female-headed households (17%). Finally, there is a strong pattern by farm size, where larger farms (those with more than 1.75 hectares) were three times as likely to receive inputs on credit compared to farms with less than 0.9 hectares.

Table 12. Percentage of farm households that received inputs on credit in 2007

Region	
Tigray	18
Amhara	25
Oromiya	27
SNNP	14
Sex of head	
Male	21
Female	17
Farm size	
Less than 0.9 ha	11
0.9 to 1.75 ha	22
More than 1.75 ha	34
Total	21

Source: Analysis of the 2008 IFPRI-EDRI EAMHS survey.

What was the source of this agricultural credit? As shown in Table 13, about three-quarters of the cases of agricultural input credit reported by farm households in the survey came from agricultural cooperatives. The Ministry of Agriculture was the second most important source of agricultural input credit, accounting for 11% of the reported cases. The remaining 14% of cases came from other sources, including input suppliers, other farmers, traders, and processors.

Table 13. Sources of agricultural input credit (percentage of cases)

	Cooperatives	Ministry of Agric.	Other sources	Total
Region				
Tigray	87	13	0	100
Amhara	91	4	4	100
Oromiya	67	16	18	100
SNNP	68	9	24	100
Sex of head				
Male	78	10	12	100
Female	53	22	25	100
Farm size				
Less than 0.9 ha	73	10	17	100
0.9 to 1.75 ha	75	12	13	100
More than 1.75 ha	77	9	14	100
Total	75	11	14	100

Source: Analysis of the 2008 IFPRI-EDRI EAMHS survey.

There was some variation by region. The proportion of input credit coming from cooperatives was greatest in Amhara (91%) and lowest in Oromiya and SNNP (67-68%). In Oromiya, the Ministry of

Agriculture was a more important source than in other regions. In SNNP, input suppliers were a relatively important source of inputs on credit.

There were also important differences between male- and female-headed households. Although cooperatives are the most important source for both groups, they provide more than three-quarters of the input credit to male-headed households, but barely half of the input credit for female-headed households (see Table 13)

On the other hand, farm size does not seem to influence the source of input credit. The importance of cooperatives, the Ministry of Agriculture, and other sources was roughly equal in the three farm-size categories we use (see Table 13).

4. Crop storage

This section describes the capacity, characteristics, and use of crop storage by farm households and cooperatives. The information about on-farm storage comes from the 2008 Ethiopian Agricultural Marketing Household Survey, while information about crop storage by cooperative unions and primary cooperatives comes from the 2012 Cooperative Storage Survey.

4.1. Crop storage capacity

On-farm storage capacity

The 2008 Ethiopian Agricultural Marketing Household Survey asked about the crop storage capacity of farm households. Almost all (97%) farmers reported having some storage capacity. The most common ways of storing grains were in a gotera (39% of households), in a container in the house (34%), and in the house without a container (24%). The percentages sum to slightly more than 100%, indicating that most farm households use just one form of storage, but a few have more than one.

The average storage capacity for a farm household is about 1.7 tons, but the median capacity indicates that half the farmers have less than one ton (see Table 14). Average storage capacity varies by region, being greatest in Oromia (2.1 tons) and least in SNNP (1.1 tons).

Table 14. On-farm storage capacity by region

Region	Average storage capacity (kg)	Median storage capacity (kg)	Estimated total capacity (million tons)
Tigray	1,294	1,000	1.04
Amhara	1,474	1,000	3.95
Oromiya	2,107	1,300	9.13
SNNP	1,085	500	1.94
Total	1,656	1,000	16.06

Source: Analysis of the 2008 IFPRI-EDRI EAMHS survey.

The sampling weights allow us to estimate the total on-farm crop storage capacity for the four main regions of Ethiopia. As shown in Table 14, farmers in these four regions have a total storage capacity of 16 million tons. Over half of this storage capacity is in Oromiya, reflecting the large share of the population living in this region as well as the larger-than-average storage capacity of the average farm in this region. Amhara represents a little less than one-quarter of the total storage capacity, followed by SNNP and Tigray.

Crop storage capacity of primary cooperatives

Of the 217 primary cooperatives interviewed for the Cooperative Storage Survey, almost all had access to storage facility, either owned 78%, rented 10%, or both owned and rented 2% (Table 5). Furthermore, about 10% of the primary coops revealed that they each had two storage facilities. On the other hand, about 9% of the primary coops said they did not have a storage facility, either owned or rented. Although only occasionally, some primary coops (2% of them) mainly those in Tigray said they get access to government-owned (e.g. *Woreda* office of Agriculture and Rural Development (WOARD)) storage facilities for free, especially when fertilizer is brought for distribution. Over 20% of primary cooperatives in the sample did not own a storage facility.

Table 15. Access to storage facilities by primary cooperatives (%)

	Percentage of primary cooperatives
Own storage	78
Rent storage	10
Own and rent	2
Neither own nor rent	9
Use WOARD storage	1
Total	100

Source: Analysis of 2012 IFPRI-ATA Cooperative Storage Survey

The average storage capacity of primary cooperatives is 1,912 quintals or 191 tons (this average includes those primary cooperatives that do not have storage capacity). The average varies from 604 quintals in Tigray to 3,142 quintals in Amhara. The median storage capacity is 1,000 quintals, meaning that half of the primary cooperatives have less than this. The median capacity is similar in Amhara, Oromiya, and SNNP, but the median in Tigray indicates that more than half the primary cooperatives in that region do not have any storage facilities. Storage capacity varies within each region as well, as indicated by the minimum and maximum capacity figures.

Using the sampling weights, we can estimate the total storage capacity of the agricultural primary cooperatives in the four main regions of Ethiopia. As shown below, the total capacity is 1.7 million tons, which is slightly more than one-tenth of the estimated on-farm storage capacity. Oromiya represents about one-half of the total storage capacity of the primary cooperatives.

Table 16. Capacity of storage facilities of primary cooperatives

Region	Mean capacity per coop (quintals)	Median capacity per coop (quintals)	Min capacity among coop (quintals)	Max capacity among coop (quintals)	Total capacity in four regions (thousand tons)
Tigray	604	0	0	10,000	37
Amhara	3,142	1,000	0	25,000	572
Oromiya	1,604	1,070	0	6,000	853
SNNP	2,088	1,000	0	31,000	243
Total	1,912	1,000	0	31,000	1,705

Source: Analysis of 2012 IFPRI-ATA Cooperative Storage Survey

As discussed earlier, not all primary cooperatives own storage facilities. Researchers asked these primary cooperatives for the main reason why they did not have their own storage facility. Over 90% of these cooperatives revealed that a lack of funds was the main reason for not building a storage facility (Table 23).

Table 17. Main reason for lack of own storage facility (%)

Reason	Nbr of cooperatives	Percentage
No need, coop does not market crops	6	8
No need, rented storage is available	0	1
Have need, but no funds to build storage	64	90
Other	1	1
Total	71	100

Source: Analysis of 2012 IFPRI-ATA Cooperative Storage Survey

Crop storage capacity of cooperative unions

The 2012 Cooperative Storage Survey also collected information on storage capacity from cooperative unions. Out of the 32 cooperative unions interviewed, 7 of them (3 in Tigray, 2 in Amhara, and 2 in SNNP) reported that they did not have any storage facilities, while eight unions actually had two storage units each. The cooperative unions were asked about the overall capacity of their storage facilities. As shown in Table 18, the average capacity was slightly less than 14,000 quintals or 1,400 tons. As with the primary cooperatives, the capacity tended to be smallest in Tigray and largest in Amhara. The median capacity was 6,000 quintals, meaning that half of the cooperative unions had less than this capacity. The largest capacity was found in a cooperative union in Oromiya with storage facilities that can hold 110,000 quintals.

Using the sampling weights, we can estimate the total storage capacity of the agricultural cooperative unions in the four main regions of Ethiopia. As shown in Table 18, the total storage capacity of these cooperative unions is 187 thousand tons. This is about one-tenth of the estimated storage capacity of all the primary cooperatives in the four main regions (1.7 million tons) and about 1 percent of the estimated total on-farm storage capacity (16 million tons). Oromiya accounts for more than half the storage capacity among cooperative unions.

Table 18. Capacity of storage facilities of cooperative unions

Region	Mean capacity per union (quintals)	Median capacity per union (quintals)	Min capacity among unions (quintals)	Max capacity among unions (quintals)	Total capacity in four regions (thousand tons)
Tigray	4,063	2,750	0	12,000	12.6
Amhara	18,075	7,500	0	50,000	47.0
Oromiya	17,613	4,500	200	110,000	98.6
SNNP	13,857	8,500	0	35,000	29.1
Total	13,979	6,000	0	110,000	187.3

Source: Analysis of 2012 IFPRI-ATA Cooperative Storage Survey

4.2. Characteristics of crop storage facilities

The quality of crop storage facilities matters as much as the capacity. This section examines the characteristics of crop storage facilities of farm households, primary cooperatives, and cooperative unions.

Characteristics of on-farm storage

The 2008 Ethiopia Agricultural Marketing Household Survey asked about the types of crop storage used by farmers. Almost all (97%) farmers reported having some storage capacity. The most common ways of storing grains was in a *gotera*, a traditional grain storage facility typically consisting of a large basket-like structure made of woven sticks and other materials, suspended above the ground on wood posts. About 39% of farm households report using a *gotera* for grain storage. It is also common to store crops in the house in a container (34% of farm households) and in the house without a container (24%). About 15% of farm households use a *gudegade*, another traditional form of grain storage involving a pit in the ground that is later covered. The percentages sum to slightly more than 100% because some farm households use more than one type of storage (see Table 19).

Table 19. Types of on-farm storage facilities

Type of storage	Percentage of farms using this type
Gotera (grainery)	39.1
Gudegade (pit in ground)	14.8
In house in a container	34.2
In house not in container	23.7
Other	18.8

Source: Analysis of the 2008 IFPRI-EDRI EAMHS survey.

Characteristics of storage facilities of primary cooperatives

The 2012 Cooperative Storage Survey asked about the characteristics of cooperative storage facilities. The storage facilities of almost all primary cooperatives had corrugated metal roofs, with little variation across regions (see Table 20). However, sometimes these roofs had holes in them. According to the survey respondents, 11% had holes representing less than 10% of the roof area, while another 2% had holes accounting for more than 10% of the roof area (see Table 21).

Table 20. Main material of the roof of storage facilities owned by primary cooperatives (%)

Roof material	Tigray	Amhara	Oromiya	SNNP	Total
Corrugated metal	95	100	100	97	100
Tiles	0	0	0	3	0
No roof (stocks cover)	5	0	0	0	0
Total	100	100	100	100	100

Source: Analysis of 2012 IFPRI-ATA Cooperative Storage Survey

Note: The overall percentage of cooperatives with a metal roof is actually 99.51%. This appears as 100% in the table because of rounding.

Table 21. State of the roof of storage facilities owned by primary cooperatives (%)

	Tigray	Amhara	Oromiya	SNNP	Total
No holes	70	79	90	86	87
One or more small holes (<10%)	15	17	10	9	11
Part of the roof is missing (>10%)	14	4	0	5	2
Total	100	100	100	100	100

Source: Analysis of 2012 IFPRI-ATA Cooperative Storage Survey

Main material of the walls of primary cooperative owned storage facilities varies slightly by region. Overall, mud and wood/sticks appeared to be the most common material for walls in the four regions followed by corrugated metal and wood (see Table 22). However, wood was more important in Amhara, while wood, mud and stone, and concrete or concrete blocks were widely used in Tigray. Corrugated metal was the second-most-common type of wall material in Oromiya.

Table 22. Main material of the walls of storage facilities owned by primary cooperatives (%)

Material of walls	Tigray	Amhara	Oromiya	SNNP	Total
Mud and wood/sticks	0	40	58	41	50
Mud and stone	32	1	6	3	6
Wood	38	51	4	21	18
Mud bricks	0	0	0	7	1
Concrete or concrete blocks	26	8	4	13	7
Corrugated metal	3	0	28	15	19
Total	100	100	100	100	100

Source: Analysis of 2012 IFPRI-ATA Cooperative Storage Survey

The main material of the floor for most of the storage facilities of the primary cooperatives was concrete followed by earth or dung. This was true in all regions, but SNNP had a smaller share of storage facilities with concrete floors (50%).

Table 23. Main material of the floor of storage facilities owned by primary cooperatives (%)

Material of floor	Tigray	Amhara	Oromiya	SNNP	Total
Earth or dung	23	41	30	44	33
Wood	0	0	1	3	1
Concrete	77	59	70	50	66
Other	0	0	0	2	0
Total	100	100	100	100	100

Source: Analysis of 2012 IFPRI-ATA Cooperative Storage Survey

Primary cooperatives were asked if their storage facilities could be sealed and locked (e.g. no holes in walls). Overall, about 96% of them revealed their storage facilities could be sealed and locked (see Table 24).

Table 24. Can the storage facilities of primary cooperatives be sealed and locked?

	Tigray	Amhara	Oromiya	SNNP	Total
Yes	92	96	96	100	96
No	8	4	4	0	4
Total	100	100	100	100	100

Source: Analysis of 2012 IFPRI-ATA Cooperative Storage Survey

The primary cooperatives were also asked how they acquired the storage facility they own (see Table 25). It appears that the majority of the storage facilities were constructed by the cooperatives themselves (86%). The Ethiopian Grain Trade Enterprise (EGTE) provided only 11% of the facilities, while the remaining 3% came from an NGO or project or built by the union.

Table 25. Source of storage facilities owned by primary cooperatives (%)

Source of facility	Tigray	Amhara	Oromiya	SNNP	Total
Obtained from EGTE	8	14	9	18	11
Obtained from an NGO	0	3	2	10	3
Built by the coop	84	83	89	72	86
Built by the union	8	0	0	0	0
Total	100	100	100	100	100

Source: Analysis of 2012 IFPRI-ATA Cooperative Storage Survey

Characteristics of storage facilities of cooperative unions

As expected, the storage facilities of the cooperative unions were larger and built with more permanent construction materials. Regarding the material used for the roof, every storage facility owned by the interviewed cooperative unions had a corrugated metal roof. Concrete or concrete blocks were the main type of material used to build the walls of cooperative union storage facilities (Table 12). This accounts for 80-100% of the storage facilities owned by cooperative unions in Tigray, Amhara, and SNNP. The storage facilities owned by cooperative unions in Oromiya were much more likely to use less permanent materials for their walls.

Table 26. Main material of the walls of the storage facilities owned by cooperative unions (%)

Material of walls	Tigray	Amhara	Oromiya	SNNP	Total
Mud and wood/sticks	0	0	25	0	12
Mud and stone	20	0	38	0	22
Concrete or concrete blocks	80	100	13	100	53
Corrugated metal	0	0	25	0	12
Total	100	100	100	100	100

Source: Analysis of 2012 IFPRI-ATA Cooperative Storage Survey

About 82% of the storage facilities owned by cooperative unions had floors made of concrete, as shown in Table 27. Although there is some variation across regions, at least two-thirds of the interviewed cooperative unions with storage facilities had concrete floors in each region.

Table 27. Main material of the floor of storage facilities owned by cooperative unions (%)

Material of floor	Tigray	Amhara	Oromiya	SNNP	Total
Earth or dung	20	0	13	33	15
Wood	20	0	0	0	3
Concrete	60	100	88	67	82
Total	100	100	100	100	100

Source: Analysis of 2012 IFPRI-ATA Cooperative Storage Survey

In summary, the storage structures of cooperative unions are more solidly built than those of the primary cooperatives. The units of cooperative unions are more likely to have concrete or concrete block walls, and they are more likely to have a concrete floor. On the other hand, the roofs were generally made of corrugated metal in both the facilities of cooperative unions and those of primary cooperatives. The better construction materials may reflect the larger size of union storage units and their stronger financial situation.

4.3. Use of crop storage facilities

Use of on-farm crop storage facilities

According to the 2008 Ethiopian Agricultural Marketing Household Survey, the average quantity of cereals in storage one month after the meher harvest is about one ton, though the regional variation is quite wide. The average ranges from 1.4 tons in Amhara to less than 300 kg in SNNP (see Table 28). At the national level, these figures imply that farmers hold 9.6 million tons of cereals in storage one month after the meher harvest. This implies that on-farm storage dwarfs the quantities stored by the government and private traders. It also means that farmer storage behaviour has a large effect on the seasonal availability of marketed grain and on seasonal price patterns.

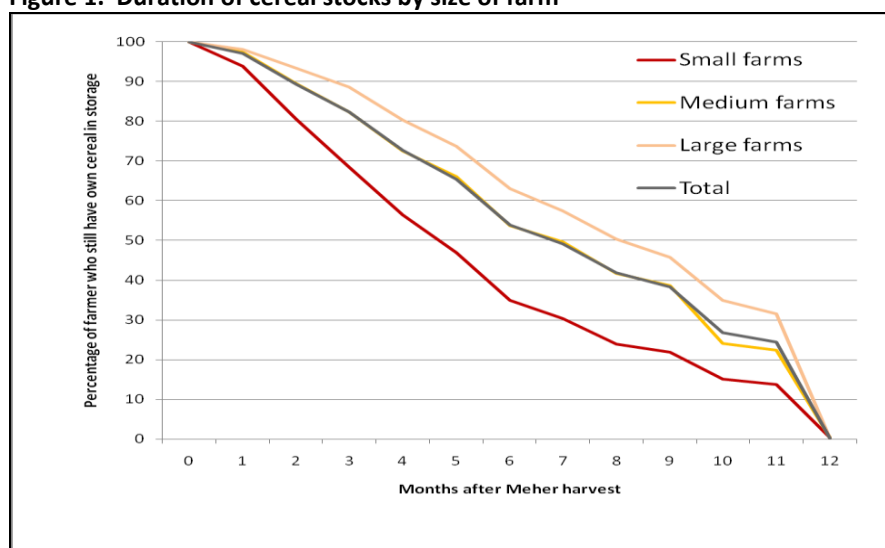
Table 28. Volume of cereals in storage one month after the meher harvest

Region	Average volume of cereals in storage one month after meher harvest	Median volume of cereals in storage one month after meher harvest
Tigray	1,193	950
Amhara	1,370	1,100
Oromiya	942	600
SNNP	297	150
Total	1,001	700

Source: Analysis of the 2008 IFPRI-EDRI EAMHS survey.

Farmers were also asked how long their cereal stocks from the Meher season last. Slightly more than one-half of the respondents reported that their stocks last six months. Not surprisingly, the length of stockholding depends on the size of the farm: just 35% of the smallest tercile of farms had stocks lasting six months; while more than 60% of the largest tercile of farms did (see Figure 1).

Figure 1. Duration of cereal stocks by size of farm



A large majority of respondents said that the main reason for storing cereals was for later consumption (88%) or seed (2%). Just 10% of respondents say they planned to sell their stocks later to get a better price or to meet cash needs later.

Farmers report that storage losses are very small. Three-quarters of the respondents said that there were no losses, while 96% said the losses were 5% or less.

Use of crop storage facilities by primary cooperatives

Based on the results of the 2012 Cooperative Storage Survey, the storage facilities of primary cooperatives were mainly used to store seed and fertilizer rather than crops. About 80% of primary cooperatives with storage facilities stored fertilizer over the past year, while 54% stored seed. In contrast, just 17% stored coffee and around 10% each stored maize, wheat, and teff. Less than half of primary cooperatives (42%) stored any crop in the previous year (see Table 29).

Table 29. Products stored by primary cooperatives over the past year

Variable	Nbr	Percentage of cooperatives storing
Maize	203	9
Wheat	203	11
Teff	203	8
Sorghum	203	1
Coffee	203	17
Other crops	203	6
Any crop	203	42
Fertilizer	203	80
Seed	202	54
Other	202	11

Source: Analysis of 2012 IFPRI-ATA Cooperative Storage Survey

Primary cooperatives were asked about the largest amount of crops held in storage over the past 12 months. As shown in Table 30, the average response was 463 quintals or 46 tons. This represents about one-quarter of the average storage capacity of primary cooperatives (see Table 16). The average varies from 277 quintals in Tigray to 572 quintals in Oromiya. The median figures indicate that most primary cooperatives in Tigray, Amhara, and SNNP did not have any crops in storage over the past 12 months. Similarly, most of the 217 primary cooperatives in the sample had no crops in storage over the past 12 months. At the other extreme, a few primary cooperatives held up to several thousand quintals of crops in storage.

Table 30. Largest amount of crops stored in the storage facility at one time in the past 12 months by primary cooperatives (quintals)

Region	Mean	Median	Min	Max
Tigray	277	0	0	1500
Amhara	251	0	0	6000
Oromiya	572	100	0	5000
SNNP	358	0	0	5000
Total	463	0	0	6000

Source: Analysis of 2012 IFPRI-ATA Cooperative Storage Survey

The cooperatives were also asked how many months of the year they maintained at least some crops in their storage facilities. Among those primary cooperatives that had stored crops over the past 12 months, some crops were in storage, on average, four months. Note that this does not necessarily mean that the same bags were stored for a full four months; there could be some sorghum in storage for two months and wheat for a different two months. There was not much variation across regions, but within each region, some had very short periods of storage, while other had some crops in storage over the full year (see Table 31).

Table 31. Period during which the storage facility had crops in storage over the past 12 months for primary cooperative (months)

Region	Mean	Median	Min	Max
Tigray	5.0	3.0	0.0	12.0
Amhara	4.5	4.0	1.0	9.0
Oromiya	4.1	4.0	1.0	10.0
SNNP	4.2	4.0	1.0	11.0
Total	4.2	4.0	0.0	12.0

Source: Analysis of 2012 IFPRI-ATA Cooperative Storage Survey

Finally, cooperative unions were asked to indicate whether their member primary cooperatives were involved in marketing of cereals or coffee². According to the cooperative unions, over 76% of primary cooperatives are involved in marketing of cereals while the rest are involved in marketing of either coffee alone or both cereals and coffee. The data suggest that all primary cooperatives in Tigray and Amhara are involved in marketing of cereals alone. Also about 41% of cooperatives in Oromiya and 15% of cooperatives in SNNP are involved in marketing either just coffee or both coffee and cereals (see Table 32).

² Cooperative unions had this information only for about 58% of primary cooperatives and the result reflects only about these primary cooperatives.

Table 32. Percentage of primary cooperatives involved in marketing cereals and coffee (%)

Product	Tigray (n=102)	Amhara (n=333)	Oromiya (305)	SNNP (211)	Total (951)
Cereals	100	100	58	84	76
Coffee	0	0	11	13	8
Both	0	0	30	2	15
Neither	0	0	1	0	0

Source: Analysis of 2012 IFPRI-ATA Cooperative Storage Survey

Use of crop storage facilities by cooperative unions

This section describes the use of crop storage facilities by cooperative unions. A majority of cooperative unions report storing crops (82%), fertilizer (60%), and seed (59%). Wheat, teff, and maize are each stored by 30-45% of the cooperative unions, while coffee is stored by 20% of them. The proportion of cooperative unions reporting input storage is somewhat less than the proportion of primary cooperatives doing so, but the share of unions reporting crop storage is larger.

Table 33. Products stored by cooperative unions over the past year

Commodity	Nbr	Percentage of unions storing
Maize	31	32
Wheat	31	43
Teff	31	38
Sorghum	31	10
Coffee	31	20
Other crops	31	27
Any crops	31	82
Fertilizer	31	60
Seed	31	59
Other	31	24

Source: Analysis of 2012 IFPRI-ATA Cooperative Storage Survey

Out of the past 12 months, the largest amount of crops stored in cooperative union storage facility at one time, on average, was 8,382 quintals or 838 tons (the comparable amount for the primary cooperatives was 463 quintals). As shown in Table 34, the median was only 2,500 quintals, indicating that half of the cooperative unions did not have more than this quantity in storage over the past year. The mean and median amount was largest for unions in Amhara, followed by Tigray.

Table 34. Largest amount of crops stored in the storage facility at one time in the past 12 months by cooperative unions (quintals)

Region	Mean	Median	Min	Max
Tigray	5,700	3,500	2000	12,000
Amhara	12,857	7,000	0	42,000
Oromiya	8,279	1,950	0	50,000
SNNP	6,286	2,500	0	22,000
Total	8,382	2,500	0	50,000

Source: Analysis of 2012 IFPRI-ATA Cooperative Storage Survey

The duration of crop storage for cooperative unions was very similar to the duration of crop storage for the primary cooperatives. The average cooperative union had some crops in storage for about four months out of the past year. There was not much variation in the average across regions; although there was considerable variation across cooperative unions within each region (see Table 35).

Table 35. Period during which the storage facility had crops in storage over the past 12 months for cooperative unions (months)

Region	Mean	Median	Min	Max
Tigray	4	4	4	5
Amhara	4	4	0	6
Oromiya	3	2	0	11
SNNP	4	4	0	8
Total	4	4	0	11

Source: Analysis of 2012 IFPRI-ATA Cooperative Storage Survey

5. Perceptions of changes in markets and public services

The 2008 Ethiopian Agricultural Marketing Household Survey asked farm households whether access to inputs and public services has improved, remained unchanged, or worsened over the past four years. More specifically, households were asked about their perceptions about input markets, credit, extension, marketing information, the quality of local roads, and the number of crop buyers.

As shown in Table 36, in every category, more respondents reported improvement than deterioration. The universal positive assessments, even in areas that do not seem to have changed much according to objective measures, raises the possibility that respondents were answering “strategically,” giving responses that they thought the enumerators (or local officials) would want to hear. However, this does not explain the variation across questions, with the proportion of household reporting improvement ranging from 40% (for availability of cereal seed) to 77% (for number of crop buyers). Thus, we will interpret the results in relative terms.

Table 36. Perceived changes in input markets and public services in 2008 compared to 2004

	Improved	No change	Worse	Total
Availability of cereal seed	40%	40%	21%	100%
Quality of cereal seed	42%	40%	18%	100%
Availability of fertilizer	47%	29%	24%	100%
Timing of fertilizer availability	44%	32%	24%	100%
Availability of credit	52%	32%	16%	100%
Availability of advisory services	70%	22%	8%	100%
Number of crop buyers	77%	20%	3%	100%
Availability of market information	68%	25%	7%	100%
Quality of roads in woreda	61%	34%	5%	100%

Source: Analysis of the 2008 EAMHS.

The highest proportion of respondents found improvements in the number of crop buyers (77%), the availability of advisory services (70%), the availability of market information (68%), and the quality of roads in the woredas (61%). The improvements in the local roads and advisory services may reflect efforts on the part of the government as part of its Agriculture-Led Development Strategy. The

improved number of crop buyers probably refers to greater competition among traders to purchase surplus grain since traders account for the majority of crop buyers. This trend and the increased availability of market information may well be associated with the increased use of mobile phones by traders, as documented in the trader survey conducted at the same time as the EAMHS. Although less than 2% of farmers own mobile telephones according to the EAMHS, they may have access to market information through traders and other villagers who do have mobile phones (see Table 36).

The lowest proportion of respondents reporting improvements was in availability of cereal seed (40%), quality of cereal seed (42%), timing of fertilizer availability (44%), and the availability of fertilizer (47%).

6. Summary and conclusions

6.1. Summary

The 2008 Ethiopian Agricultural Marketing Household Survey collected information on a range of topics from a stratified random sample of 1707 farm households in the four main regions of Ethiopia. Based on the results of this survey, we can summarize the role of cooperatives in the agricultural activities of Ethiopian farmers as follows:

- About 36% of the farmers in the four main regions of Ethiopia are members of an agricultural cooperative. The percentage is higher in Amhara, among male-headed households, among larger farmers, and among literate farmers.
- A large majority of cooperative members (88%) buy fertilizer through the cooperative. Smaller majorities of members buy other inputs and have received credit from the cooperative. Barely one-quarter of cooperative members sell grain crops through the cooperative.
- Farmers in the four main regions of Ethiopia sell approximately 2.2-2.5 million tons of the four main cereal crops, maize and teff account for about two-thirds of the total.
- A large majority of all crop sales (88%) take place in a local market, the buyer being either a trader (77%) or a consumer (18%). These patterns hold in all four regions. Cooperatives are involved in just 1% of all crop sales transactions.
- About 7% of farm households sell cereals through an agricultural cooperative. This percentage is higher in Amhara and among larger farmers. Among those that sell through cooperatives, about two-thirds sell less than half their marketed surplus of cereals.
- The main reasons given for selling crops through the cooperative is to receive the dividend, because the cooperative offers a good price, or because the household needs to repay a debt to the cooperative.
- The main reason given for not selling crops through the cooperative is that the local cooperative does not buy crops. Other reasons include distance to the cooperative and low prices being offered.
- Agricultural cooperatives rarely provide cash loans to members. Just 1% of the farm households interviewed received a cash loan from an agricultural cooperative during the year before the interview.
- On the other hand, agricultural cooperative play an important role in providing inputs on credit. About one-fifth of farmers reported receiving inputs on credit in 2007, and three-quarters of this credit was provided by agricultural cooperatives.

Information on crop storage capacity is available from the 2008 EAMHS and the 2012 Cooperative Storage Survey. Some of the main findings are given below:

- Almost all (97%) farmers have some on-farm storage capacity.
- On-farm grain storage capacity is about 1.7 tons on average, and half of the farms have a capacity of at least one ton. Storage capacity is larger in Oromiya and smaller in SNNP.
- We estimate that, across the four main regions of Ethiopia, farmers have a total crop storage capacity of about 16 million tons, of which Oromiya accounts for about half.
- About 80% of primary cooperatives have their own storage facilities, and most of the remainder have access to storage facilities.
- The average primary cooperative has storage capacity of about 190 tons, although half the primary cooperatives have less than 100 tons of capacity.
- Across the four main regions of Ethiopia, primary cooperatives have an estimated total storage capacity of 1.7 million tons, about 10% of total on-farm capacity.
- The average cooperative union has storage capacity of about 1400 tons, although half have less than 600 tons of capacity.
- Across the four main regions of Ethiopia, cooperative unions have an estimated total storage capacity of 0.19 million tons, roughly 1% of total on-farm capacity.

These two surveys also provide information on the characteristics of the storage facilities owned by farmers and cooperatives:

- Over half of farm households store grain in the house, either in a container (such as a sack) or in a pile. About 39% of farmers use a *gotera*, or traditional granary. Less common is the *gudegade*, or pit in the ground.
- The storage facilities of primary cooperatives generally have a corrugated metal roof (100%), mud and wood walls (50%), and a concrete floor (66%). Some have metal (19%) or wood (18%) walls, and some have earth floors (33%).
- The storage facilities of cooperative unions also have corrugated metal roofs (100%), but the walls are more likely to be concrete or concrete block (53%), and a larger share of the floors are concrete (82%).

In addition, the survey shed light on the use of crop storage facilities by farmers and cooperatives:

- Farm households have, on average, about one ton of cereals in storage a month after the harvest. This represents about 9.6 million tons at the national level.
- Almost all farmers said the main use of on-farm storage is for later consumption. Only 10% said that the main reason for storing the crop was to sell it later.
- Farmers report that the physical losses from on-farm storage are quite small: 96% say that the losses are less than 5%.
- Most primary cooperatives (58%) reported not storing any crops during the past 12 months, but 80% reported storing fertilizer and 54% stored seed.
- Among those primary cooperatives that stored crops, coffee, wheat, maize, and teff were the crops most often stored.
- The largest amount of crops in storage at primary cooperatives over the past year (including those that did not store any) was, on average, 46 tons, about one-quarter of the average storage capacity.

- Crop storage was more common among cooperative unions than among primary cooperatives. About 82% of cooperative unions stored crops over the past year.
- The largest amount of crops in storage at cooperative unions over the past year (including those that did not store any) was, on average, 830 tons, about three-quarters of the average capacity of cooperative unions.

Finally, the farm household survey asked about farmer perceptions of agricultural markets and rural public services. Farmers were asked to compare the current situation (in 2008) with the situation four years before on nine dimensions. We can summarize the results as follows:

- In every dimension tested, more farmers reported improvements than deterioration. Accepting these results at face value, it implies that they were generally satisfied with changes occurring in the agricultural economy.
- However, they were more positive about some dimensions than others. More than two-thirds reported improvements in the number of crop buyers (a measure of competitive markets), the availability of advisory services (extension), and the availability of agricultural market information.
- In contrast, less than half reported improvements in the availability of cereal seed, the quality of cereal seed, the timing of fertilizer availability, and the availability of fertilizer.

6.2. Conclusions

What do these results mean for efforts to expand the role of agricultural cooperatives in crop marketing? First, for most cooperatives, getting involved in crop storage and marketing would mean launching a new activity rather than expanding an existing activity. The results of the survey suggest that agricultural cooperatives currently handle a negligible proportion of crop marketing: about 1% of all crop sales transactions. Almost all crop marketing is handled by private traders and other private sector agents. Expanding the role of cooperatives in marketing will require increased storage capacity, strengthened financial strength, and improved technical and management skills.

Second, current storage capacity of primary cooperatives is about four times greater than the maximum volume of crops in storage at these cooperatives during the year. This suggests that storage capacity is not the binding constraint that prevents cooperatives from expanding their role in crop marketing and storage. Other constraints are probably more binding, such as the financial capacity of cooperatives to buy crops at harvest and sell them several months later. Expanding storage capacity without addressing financial and managerial constraints will probably have a limited effect.

Third, cooperative storage capacity is far below what would be needed to handle the marketing of cereals, pulses and coffee. The results of the 2008 survey indicate that the marketed surplus of cereals is about 2.5-2.7 million tons. The marketed quantities of pulses and coffee represent another 0.8 million tons. In contrast, the storage capacity of primary cooperatives is about 1.7 million tons, while that of cooperative unions is less than 0.2 million tons.

Fourth, cooperative storage capacity should probably be seen as a complement to farm-level storage rather than a substitute. Farm-level storage has a national capacity of close to 17 million tons, and it is used primarily for storing grain for later consumption by the household. Storing grain for later consumption at the cooperative level would require a ten-fold increase in storage capacity and would involve costly movement of grain from households to the cooperative at harvest and back again in the off-season. Thus, it is likely that on-farm storage (mainly for later consumption) would not be displaced, even if cooperative storage (mainly for marketing) is greatly expanded.

Fifth, the results indicate that farmers see the changes in agricultural markets over the past 5-10 years in a relatively favourable light. In particular, very large majorities of farmers see

improvements in the number of crop buyers and the availability of agricultural market information. This suggests that the level of competition and choice in agricultural markets has been increased by market liberalization policies implemented by the government over the last 10-15 years. Programs to increase the role of agricultural cooperatives in marketing should proceed by opening up new opportunities for farmers to market through cooperatives rather than imposing restrictions on existing marketing channels. This would build on the progress made by government policies to date rather than undercutting it.

Sixth, improving the performance of fertilizer marketing by agricultural cooperatives would probably build confidence in the ability of cooperatives to handle crop marketing. The results of the survey showed that fertilizer availability and timing of fertilizer delivery, functions in which cooperatives play a dominant role in the rural economy, are two dimensions showing relatively low levels of satisfaction among farmers. Efforts to improve service delivery in areas where cooperatives dominate should take precedence, or at least run in parallel, with effort to expand cooperative functions into relatively “new” areas such as crop marketing.