Somali Democratic Republic

Ministry of Agriculture

Directorate of Planning and Statistics/Food Security Project

Selected Food Security Research Findings: A Seminar Discussion

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1. **Sample Characteristics:** Recall from Table 1 characteristics about our sample villages. These are not randomly selected villages, but are thought to be reasonably representative of more accessible villages in the Lower and Middle Shabelle. Households within villages are randomly selected.

Table 1
Selected Villages and Sample of Farmers

Region	District	Villages	Sample of Selected Farmers: Control Group	Credit Recipients	Total
1.Lower Shabelle	1.Afgoi	1.Barire	25	8	33
		2.Aw-Dhegle	18	12	30
		3.Darsalam	24	7	31
	2.Merca	1.Ugunji	25	10	35
		2.Sigale	25	7	32
		3.Sameisamey	23	5	28
	3.Qorioley	1.B/Shekh	25	9	34
2.Middle Shabelle	1.Jowhar	1.Kallundi	25	9	34
		2.Bananey	24	11	35
		3.Barrey	25	9	34
TOTAL			239	87	326

2. **Land Ownership and Employment Access:** Study results in Table 2 show very strong concentration of land ownership in sample villages. Some 53 % of the farmers own only about 8 % of the total area , while the 9.3 % of the farmers who own farms of 30 ha or larger control 62 % of the land. Many observers of the agricultural situation in Somalia suggest that over the past 5-7 years this concentration has grown significantly. Incentives to invest in agriculture in the irrigated areas of the country seem to have resulted in many new farms that are larger than the 30 ha maximum prescribed by current land ownership laws in Somalia. Nonetheless, as shown in Table 2, farms of over 30 ha in our sample do not use their available farm land very intensively (only about 25 % of the land available is cropped in this size category).

Concerns about how to maintain and increase opportunities for small farms of 5 ha and less are important and must address the issue of access to land. Yet the issue of access to non-farm income earning opportunities for small farmers is equally important. As shown in Table 3, gross farm cash revenue for the period January-July 1987 for the average farm in the sample is some 53643 So. Sh., of which about 28 % is obtained from off-farm sources. For farms of 2.9 ha and less, off-farm revenue constitutes some 40 to 50 % of total household gross cash

TABLE 2

Farm Size Distribution of Somalia Study Sample (in hectare categories)[1]

Farm Size	Number of Farms	Percent of Farms	Cumulative Percent	Total Area Ha	Total Area Percent	Average Farm Size	Average Area Cropped Gu 1987
< 1.0 Ha	26	8.1	8.1	13.8	0.4	0.52	0.97
1.0-2.0 Ha	81	25.2	33.3	100.3	3.2	1.23	1.41
2.0-3.0 Ha	61	19.0	52.3	128.2	4.1	2.10	1.64
3.0-5.0 Ha	48	15.0	67.3	170.9	5.4	3.58	2.08
5.0-10.0 Ha	44	13.7	81.0	286.2	9.1	6.55	3.64
10.0-30.0 Ha	31	9.7	91.7	496.1	15.8	16.22	6.90
30.0 or more Ha	30	9.3	100.0	1942.1	61.9	65.76	15.14
TOTAL	321	100.0		3156.0	100.0		

revenue. (After further analysis, net household cash revenue will be estimated and it is likely to not reduce the relative importance of off-farm cash revenue for the smaller farm sizes nearly as much as for the larger farms because of the relative importance of cash inputs for larger farmers. Valuing on-farm production for each household's own consumption will increase the importance of on-farm production in total household income.)

Also shown in Table 3 is the fact that wage employment on other farms constitutes more than 50 % of the off-farm cash revenue for most farm size categories. Since it is the larger farms and plantations that hire-in labor in the rural areas, incentives and opportunities for larger farmers to invest in intensively exploiting their available land can significantly expand off-farm employment opportunities for smaller farmers. Short of very highly technified and cash input intensive agriculture, small farmers of 3 ha and less will most likely have a difficult time surviving on farm income alone. Creating more on-farm as well as off-farm income earning opportunities for small farm rural households is essential.

TABLE 3

Gross Household Cash Revenue January-July 1987

	Household Cash Revenue -Gross			
	Total Household ~~Cash Revenue~~	Farm Cash Revenue	Total Off-Farm	Off-Farm Ag. Wages
Farm Size in Hectares				
< 1.0 Ha	45626	19174	26453	10518
1.0-1.9 Ha	44122	32409	11713	8495
2.0-2.9 Ha	34475	19229	15246	8007
3.0-4.9 Ha	43877	31188	12689	8694
5.0-9.9 Ha	74500	61916	12584	6450
10.0-29.9 Ha	44888	36039	8848	4784
30 Ha or More	116155	86892	29263	11893
Entire Sample 321	53643	38436	15207	8275
	(100%)	(71%)	(28%)	

Income expressed in Somali Shillings

3. Credit Access and Input Availability Problems:
The UNCDF credit program reaches a very small portion of Somali farmers in the irrigated regions of the Shebelle (probably less than 1 % of the population). By design the FSP sample contains 87 farmers who were UNCDF credit recipients. This does not mean that 87 out of 326 farmers receive credit. Until further analysis is completed the only comments that can be made about the UNCDF program is that some 49 % of the participants have average farm size of less than 5 ha and 51 % have farms of 5 ha or larger.

Information in Tables 4, 5, and 6 display results of the farm level survey about agricultural inputs and agronomic practices utilized in the 1986 Der and 1987 Gu crop season. A number of important findings are shown in these data. First, consider Table 4. In the Der only 29 (or 18 %) of the maize growing farmers used Somtux improved variety, 19 farmers (12 %) used fertilizer and 57 farmers (36 %) used insectides against the maize stem-borer (See Table 4.). Row planting is clearly a widely accepted practice.

In comparison to the above Der, 305 farmers (95 %) of the sample planted maize in the Gu 1987. Ninety-nine (32 %) used Somtux seed, 40 (13 %) used fertilizer, and 106 farmers (35 %) used insecticide on maize(See Table 5). Since the FSP sample contains 87 UNCDF participants, it is expected that the sample proportions using various inputs will be biased upward. Further analysis will adjust for these factors.

Yet from the preliminary analysis it is quite clear that the proportion of farmers using fertilizer during the 1987 Gu is significantly smaller than in prior years. Approximately 30 % fertilizer use rate was found by other researchers for the 1986 Gu crop (Boetang et.al.,1987). Other studies by Boetang suggest that overall fertilizer use is only some 7 % in irrigated areas. When the necessary adjustments are made in the FSP sample, it is likely that overall fertilizer use in Gu 1987 will be less than 2-3 %.

It is very important to note the information in Table 6. Only 13 farmers in the entire FSP sample managed to use a combination of the major inputs recommended, such as fertilizer, insecticide, and improved seeds. If the maize technological package is indeed an improvement over traditional methods, survey results suggest that for the 1987 Gu crop there was a nacional disaster in terms of missed opportunities for farm households to use modern inputs and improve their level of living and household food security.

TABLE 4

Input Use and Selected Farm Practices on Maize
During Der 1986-87 by Farm Size

Farm Size	Farms Planting Maize		Use of Somtux Seed		Fertilizer Use		Insecticide Use		Row Planting		Two or More Weedings		Two or More Irrigations	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
<1.0 Ha	6	23	0	0	0	0	3	50	5	83	2	33	2	33
1.0-2.0 Ha	45	55	7	16	4	9	15	33	34	76	22	49	23	51
2.0-3.0 Ha	35	56	7	20	2	6	10	29	29	83	10	29	22	63
3.0-5.0 Ha	25	51	2	8	0	0	4	16	23	92	3	13	12	48
5.0-1.0 Ha	23	51	3	13	3	13	10	43	17	74	10	45	12	52
10.0-30.0 Ha	15	48	4	27	6	40	9	60	13	87	8	53	9	60
≥30 Ha	10	33	6	60	4	40	6	60	8	100	5	50	5	50
	159	50	29	18	19	12	57	36	129	81	59	37	85	53

Source: First Farm Survey, January 1987

Notes: 159 of 318 farms (50%) planted maize during Der 1986-87. 56 of the 57 farms using insecticide used Basudin. 18 of the 19 farms using fertilizer used urea -- only one used NPK.

TABLE 5

INPUT Use and Selected Farm Practices on Maize During Gu 1987 by Farm Size

Farm Size	No. Farms Planting Maize	Use of Somtux Seed		Fertilizer Use		Insecticide Use		Row Planting		Three or More Weedings		Irrigation		Clean Canals	
	N	N	%	N	%	N	%	N	%	N	%	N	%	N	%
<1.0 Ha	25	7	28	3	12	10	40	21	84	6	24	20	80	23	96
1.0-2.0 Ha	77	27	35	10	13	30	39	67	87	11	14	63	82	67	87
2.0-3.0 Ha	56	13	23	5	9	15	27	47	84	8	14	45	80	46	82
3.0-5.0 Ha	46	14	30	7	15	15	33	35	76	4	9	30	65	31	67
5.0-10.0 Ha	42	15	36	6	14	11	26	35	83	8	19	30	71	31	74
10.0-30.0 Ha	31	11	35	4	13	12	39	22	71	7	23	21	68	23	74
30 or more Ha	28	12	43	5	18	13	46	21	75	5	18	19	68	18	64
TOTAL	305	99	32	40	13	106	35	248	81	49	16	228	75	239	85

Source: Third Farm Survey, July 1987.

Notes: 305 of 321 farms (95%) planted maize during Gu 1987. 103 of the 106 farms using insecticide used Basudin. 39 of the 40 farms using fertilizer used urea -- only one used NPK.

TABLE 6

FARMER USE OF VARIOUS INPUTS AND INPUT COMBINATIONS
BY DISTRICT GU 1987 (MAIZE GROWERS ONLY)

	District									
	Jowhar		Afgoi		Merca		Qorioley		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Total No. Farmers	96	100	86	100	93	100	34	100	311	100
Single Inputs										
Improved seed only	3	3	29	34	46	48	0	0	78	25
Fertilizer only	1	1	23	27	15	16	0	0	39	13
Insecticide only	3	3	41	48	54	57	6	18	104	33
Input Combinations										
Improved seed and insecticide	1	1	20	23	32	34	0	0	53	17
Improved seed and fertilizer	0	0	10	12	3	3	0	0	13	4
Insecticide and fertilizer	0	0	22	26	15	16	0	0	37	12
Improved seed, insecticide and fertilizer	0	0	10	12	3	3	0	0	13	4

Source: Third Producer Survey.

The UNCDF credit in-kind program and the activities of the extension and research service of Somalia have promoted the adoption of yield-increasing inputs. It is hoped that the demand and adoption rates for fertilizer, improved seeds, and other inputs will increase in the future. Yet good intentions are not enough! Input packages that have real economic payoffs must be available at the right place and at the right time for farmers to effectively utilize them. Survey results suggest that this did not happen, even for the pilot programs in the 1987 Gu crop. Diesel fuel shortages also complicated events during the Gu planting periods.

What can public and private leaders do to at least get the pilot programs back on track for the 1988 Gu? Over the longer run, how can scarce public resources be used to complement scarce private sector resources in order to get more agricultural inputs in the market place for farmers of the Shebelle? FSP applied research results suggest that the challenge is perhaps even greater than that perceived by many people. If only the vigor and persistence of the Somali farmer could be brought to bear on these problems!

4. Maize Stocks and Prices: Maize stocks and seasonal price levels are always important issues of discussion in Somalia. Following the drought during the 1986-87 Der crop, current policy discussion is focused on the size and potential role of a food security stock, and how to better anticipate the likelihood of food scarcity. Preliminary data from the Food Security sample villages is helpful to inform debate about storage needs and likely price changes over the next 6-12 months. Farmers in the Food Security sample have been asked about approximate maize stock levels at three strategic periods over the past 12-18 months. Price in relevant farm and retail level markets have also been collected and analyzed.

Table 7 shows the household maize stock positions for three critical periods. After the 1986 Gu harvest 155 of the 321 farms in the sample reported having maize in storage of some 12.8 quintals. After the 1986-87 Der harvest the number of households with maize stocks increased to 220, with mean holdings of 13.4 quintals. At the peak of the hungry season (just before the Gu harvest) in 1987 maize stocks were reported to have been reduced to 6.6 quintals and were held by only 72 households (22 %) in the sample.

TABLE 7

Household Maize Stocks at Different Points, 1986-87, by District
(only households storing maize included in calculations)

	After Gu Har. 1986			After Der. Har.86			Before Gu Har.87		
	No. Farms	Mean	Median	No. Farms	Mean	Median	No. Farms	Mean	Median
District									
Jowhar	47	7.0	3.5	101	7.7	5.0	17	3.1	2.0
Afgoi	32	18.0	6.5	34	27.3	15.0	11	16.0	4.0
Merca	46	8.3	4.5	59	16.6	10.0	33	6.5	2.0
Qorioley	30	23.5	15.5	26	10.0	6.0	11	2.5	2.0
Total	155	12.8	6.0	220	13.4	6.0	72	6.6	2.0

Maize stocks are reported in quintals

Tables 8 and 9 examine the maize stock positions by district and on the basis of the entire sample, as well as for just the farmers holding stocks. Observe in Table 8 that sample wide average stocks of maize were reduced to 1.5 quintals per household by the end of the Gu growing season in 1987. This information is very significant, especially if this relationship can be shown to hold for the more general farm population in the Lower and Middle Shabelle. Even in a normal year such as in the 1987 Gu, maize stock carryover levels are generally thought to be much larger than 1.5 quintals per household. Plans to design a national food security stock will have to carefully examine these results and determine whether they are indeed widespread. Table 10 shows maize stock holdings by farm size and suggests that it is especially important to understand the storage behavior and strategy of the larger farmers, since they are the clearly the participants holding sizable inventories and could perhaps be encouraged to hold larger stocks if expectations of normal returns to storage investments could be realized.

An average household carryover stock of only 1.5 quintals causes few problems when the anticipated harvest is normal or better than normal. In fact, farmers most likely reduce their maize stocks to these low levels in anticipation of the upcoming harvest. Farmers and other rural consumers who expect to be net purchasers of maize during the following year would be well advised to consider building their own stocks before and during Gu harvest periods.

Seasonal maize price behavior shown in Figure 1 is closely related to the maize supply, utilization, and stock position discussed above. Unfortunately there is no historical farm level price series available in Somolia. The Food Security Project has collected prices in farm assembly, wholesale, and retail markets only since December 1986. Analysis shows that prices at these various levels do tend to move up and down together. Hence prices at one level of the marketing system do tend to be good predictors of prices at other levels. Prices collected by the FSP for retail markets in Mogadishu can therefore be used as an indicator of farm level prices for the period Sept. to Dec., 1986. As will be discussed below, they could also be important indicators as to the domestic supply situation over the forthcoming months.

September?

Thus observe that prices increased quite quickly after the Gu harvest in 1986, especially as farmers and merchants realized that the Der 1986 crop was going to be relatively poor. Farm prices reached a peak of 2834 So. Sh./Qt. in April 1987. ADC stocks were sold during each of the first six months of 1987 in order to partially reduce the seasonal price increase. These sales undoubtedly helped keep farm, wholesale and retail prices from going higher than they actually did in April and May. As the forthcoming 1987 Gu harvest appeared close to normal, farmers began to sell stocks and merchants began to anticipate a new

Was ADC sales?

TABLES 8 A & B

Maize in Storage Before Gu Harvest in 1987, by District

(in quintals)

	Maize in Storage, before Gu harvest 87				
	No. Farms	% Farms	Mean Quantity	Minimum Quantity	Maximum Quantity
District					
Jowhar	103	32.1%	.2	0.0	7.0
Afgoi	89	27.7%	4.2	0.0	100.0
Merca	95	29.6%	.5	0.0	10.0
Qorioley	34	10.6%	.9	0.0	15.0
Total/Summary Statistic	321	100.0%	1.5	0.0	100.0

All households included in calculations.

Maize in Storage Before Gu Harvest in 1987, by District

(in quintals)

	Maize in Storage, before Gu Harvest 87				
	No. Farms	% Farms	Mean Quantity	Minimum Quantity	Maximum Quantity
District					
Jowhar	7	9.7%	2.8	1.0	7.0
Afgoi	28	38.9%	13.3	.5	100.0
Merca	32	44.4%	1.6	.1	10.0
Qorioley	5	6.9%	5.9	.5	15.0
Total/Summary Statistic	72	100.0%	6.6	.1	100.0

Only households storing maize included in calculations.

TABLES 9 A & B

Maize in Storage After Gu Harvest in 1986, by District

(in quintals)

	Maize in Storage, After Gu Harvest 1986				
	No. Farms	% Farms	Mean Quantity	Minimum Quantity	Maximum Quantity
District					
Jowhar	103	32.1%	.6	0.0	10.0
Afgoi	89	27.7%	10.2	0.0	150.0
Merca	95	29.6%	9.4	0.0	90.0
Qorioley	34	10.6%	3.8	0.0	50.0
Total/Summary Statistic	321	100.0%	6.2	0.0	150.0

All households included in calculations.

Maize in Storage After Gu Harvest in 1986, by District

(in quintals)

	Maize in Storage, after Gu Harvest 1986				
	No. Farms	% Farms	Mean Quantity	Minimum Quantity	Maximum Quantity
District					
Jowhar	20	12.9%	3.0	.5	10.0
Afgoi	59	38.1%	15.4	1.0	150.0
Merca	62	40.0%	14.4	.5	90.0
Qorioley	14	9.0%	9.3	1.0	50.0
Total/Summary Statistic	155	100.0%	12.8	.5	150.0

[illegible] households storing maize included in calculations

TABLES 1o A & B

1987

Maize in Storage by Farm Size Category, Before Gu Harvest

	Maize in Storage			
	No. Farms	% Farms	Mean Stored Maize	Std. Dev.
Farm Size in Hectares				
< 1.0 Ha			1.3	1.0
1.0-1.9 Ha			5.0	11.2
2.0-2.9 Ha			2.6	2.6
3.0-4.9 Ha			2.3	2.8
5.0-9.9 Ha			12.8	30.8
10.0-29.9 Ha			3.8	5.3
30 Ha or More			14.7	20.1
Entire Sample	72	100%	6.6	15.5

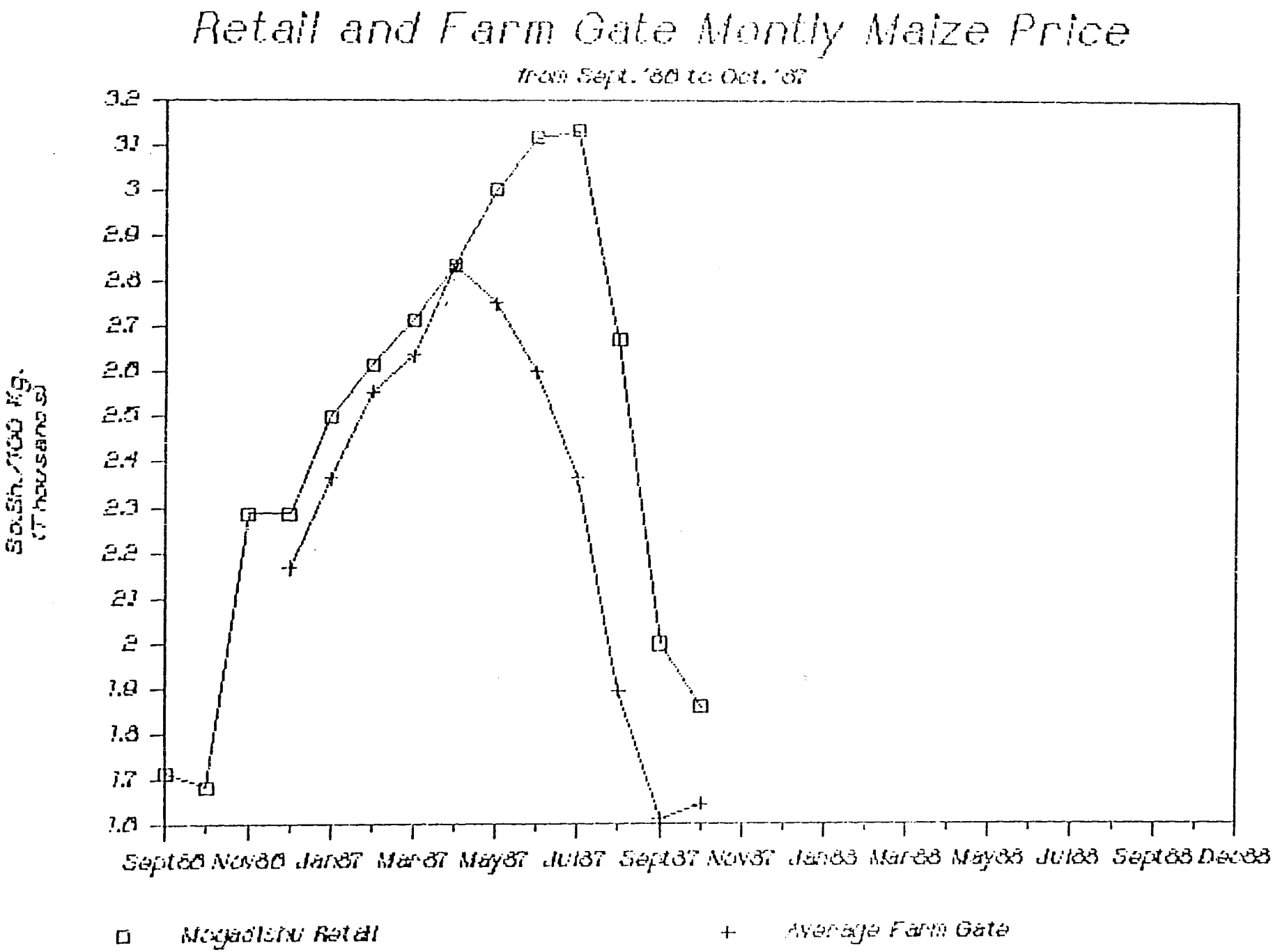
Maize quantities expressed in quintals

1986

Maize in Storage by Farm Size Category, After Gu Harves

	Maize in Storage,			
	No. Farms	% Farms	Mean Stored Maize	Std. Dev.
Farm Size in Hectares				
< 1.0 Ha			14.7	19.8
1.0-1.9 Ha			12.5	17.4
2.0-2.9 Ha			11.6	18.6
3.0-4.9 Ha			7.5	6.8
5.0-9.9 Ha			10.6	11.1
10.0-29.9 Ha			9.5	7.4
30 Ha or More			26.4	40.1
Entire Sample	155	100.0%	12.8	19.7

FIGURE 1.


Retail and Farm Gate Montly Maize Price
from Sept. '86 to Oct. '87
So.Sh./100 Kg.
(Thousands)
3.2
3.1
3
2.9
2.8
2.7
2.6
2.5
2.4
2.3
2.2
2.1
2
1.9
1.8
1.7
1.6
Sept86 Nov86 Jan87 Mar87 May87 Jul87 Sept87 Nov87 Jan88 Mar88 May88 Jul88 Sept88 Dec88
Mogadishu Retail
Average Farm Gate

crop. This is likely to have helped lower prices significantly as the Gu harvest approached. It is unclear whether ADC sales contributed to or reduced the timing and magnitude of the price decrease between May and September 1987.

unclear

A key question facing farmers, merchants and consumers, as well as government officials is how quickly (and how high) will prices rise in late 1987 and early 1988? How long should farmers who are in a position to be net sellers hold stocks? ADC has reduced their total stock significantly, although it is still difficult to know exactly how much edible maize they have in stock. For the forthcoming season, how much maize should ADC purchase, and for how long should they hold their stocks? If they under-purchase and the 1987 Der crop is lower than normal, the country could have to turn quickly to imports to satisfy consumer needs at reasonable price levels. Government analysts need to be alert to this possibility over the next 6 months. Perhaps the most available and objective indicator of the possibility of shortages is the rate at which prices increase over the next 6 to 8 months. It is therefore very important for the Planning Department of MOA to continue the collection, and timely analysis and difussion of wholesale and retail price information for key domestic markets.

6 stocks from which yrs

Returning to the stock question, if ADC does purchase too much their financial position will be strained and if they sell their stock at the inappropriate time, normal seasonal prices increases could be interrupted, and farmers and merchants carrying stocks could not be paid enough to cover inventory carrying costs. This could interrupt the positive progress made in recent years in terms of encouraging farmers and private merchants to play a greater role in the domestic marketing system. ADC analysts and decision makers likewise need current and accurate market information, and need to use this to make strategic purchases and sales to stabalize market behavior consistent with market participants' normal cost recovery expections.

but not yet much
stores in response to
P movements; more
motivated by FS consids

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