

4. IRRIGATION AGRICULTURE - MAINSTAY OF THE LOCAL ECONOMY

4.1 Some General Comments on the Agriculture in the Project Area

The areas of the SHIRA Project are situated in the district of "Shabeelle Hoose", one of Somalia's most productive regions with a considerable potential for further agricultural development. This region can be classified into three productive zones with different emphasis on production:

- 1) The region around Afgooye belongs to the hinterland of Mogadishu and produces agricultural commodities for the daily requirements of the expanding capital;
- 2) The region around Janaale, one of Somalia's centres of plantations, produces agricultural commodities for exportation;
- 3) The areas situated between the region of Afgooye and Janaale and downstream after the export zone of Janaale produce basically staple crops for local consumption and for the markets of urban centres.

Both SHIRA Project Areas can be assigned to zone 3), having several common characteristics determining their agricultural production:

- gravity irrigation based on biannual periods of high water;
- emphasis on production of seasonally alternate growing of maize and sesame with a tendency of diversification;
- dominance of subsistence economy and an increasing importance of market production;
- the predominant farm size is below 3 ha and managed by one family with an average of 2.5 to 3.5 labour units;
- the potential agricultural land around the villages has most likely been registered by absentees from urban centres and is hardly accessible for local farmers to extend their farmland;
- water is regarded as an input of unlimited availability with open access if taken directly from the river;
- Mogadishu is the main centre for marketing the agricultural products.

Despite these common characteristics of agricultural production both areas have a different history influencing their present development.

The farming system in both project areas is based on subsistence agriculture with household economic strategies not oriented to market or export-oriented production.

The analysis of the samples shows that all farmers tend to diversify their income. The major source of income from farm families with 1 ha and more is crop production and livestock whereas farmers with less than 1 ha have to work as labourers in addition to their crop production.

All farmers have a profound risk-aversion (especially small farmers) and have economic diversification strategies to ensure the family survival under the unpredictable economic conditions of Somalia. There is a tendency for settled farmers to try to increase their livestock (Area B) and for the pastoralists to emphasize the crop cultivation by settling family members in the irrigated riverine areas (Area A).

The agricultural production of both project areas is almost exclusively based on gravity irrigation. Rainfed agriculture is very uncommon due to the far distance of the farm plots from the settlements and the risks for the production involved (e.g. damages by animals, insufficient return from the input). Therefore farmers prefer to increase their agricultural area by investing in the extension of the irrigation system.

Farmers tend to work not only one farm plot, but like to have scattered fields in numerous parts of the settlement area within a reach of 1 to 1.5 hours walk. The analysis of the findings reveals that approximately 30 to 40 % of the farmers have two or more farm plots. The fields are located either near to the river (jiimo) and near the irrigation canals, or further away from the river (fuyuumo), where it is still possible to irrigate. In Project Area A some farmers also possess newly cleared areas in the region of Kurtunwarey and Alafutow, because they require additional agricultural land to meet their family's needs.

On the basis of their different occupations and associated spatial behaviour, as well as their different social and political status, the permanent and temporary population of the project areas can be differentiated into four major groups:

- The traditional sedentary farmers with no or only a small number of livestock kept in the village;
- The sedentary farmers of nomadic origin, some of whom own a considerable amount of livestock, in which case part of the family leads a nomadic existence, only living in the village during the dry seasons;
- The sedentary trading and craftsman families, who usually also own farm land and livestock and
- The nomadic groups from other regions who are closely associated with the autochthonous nomadic families on a social and economic level.

These major groups, however, can also be composed of diverse, sometimes rival groups with varying social status.

The evolution of resource use, involving all four groups, has demanded agreements, integrated activities, cooperations and other links which allow each group to take advantage of these sources. Interlinkages have therefore been established between rangeland areas, the riverine zone and the urban centres which ensure better survival of all. Along with the rapid commercialization of the rural economy, the subsistence strategies are increasingly influenced by the exchange and trade mechanism. The economic differentiation is being determined by these influences as well as the traditional values and the status of the various groups.

Farmers in both areas are aware of this process and rationally react to these changes by modifying their management decisions concerning farming systems and economic strategies. The increasing monetarization of the agricultural production leads to negative development of the exchange rate for products of the livestock-keeping nomadic population in both areas and chances for diversification of the economic and agricultural activities of the farming population in the riverine areas, also favoured by the growth of inhabitants in the urban centres.

The historically higher status attributed to the nomads derived, among other reasons, from their "wealth" in animals, regarded as a tradeable commodity or seen as an asset which can survive even in drought periods. The improved conditions for crop production, along with the provision of international aid in case of disasters, changed the status of farmers and made farming more attractive to nomadic and semi-nomadic groups. This tendency is supported by the fact that more farmers invest their surplus in livestock guarded by nomads in need of additional income, either in terms of agricultural products or money.

4.2 Local Farm Types - An Approximation

The farming systems analysis has identified various farm types in both areas. They developed within the existing socioeconomic framework and are largely influenced by social and cultural interactions as well as by the influence of technical, economic and commercial conditions. The main categories of types are:

- a) Small-scale farm families with little land (owned or rented) where all family members are to contribute to the income by working as labourers. Their means for extending their own production and their access to inputs is limited. Moreover they usually have a low social status and cooperate frequently in self-help groups;
- b) Small-scale farmers who work their land with the family labour force and who produce at a subsistence level. They practice basically risk-avoiding strategies to secure the basic needs of cereals and dairy products for the family. This group also employs hired labour during periods of high labour requirement (e.g. for irrigation, weeding, harvest);
- c) Small-scale farmers who produce surplus for marketing but practice risk-avoiding strategies. They work with the family labour force and employ labour if needed.
- d) Medium-scale farmers with sufficient resources to produce for the market and the capacity to diversify their production. They usually have the means to buy inputs and to employ labour regularly. This group tends to invest surplus outside its own agricultural production;
- e) Large-scale farmers who produce for the market and employ a permanent labour force or a farm manager (kabraare) who organizes the production. Among the resident farmers they have the best access to inputs and are likely to use their surplus to diversify the income by investments in other sectors of production or services. They have the resources to introduce and to use new agricultural practices and techniques. This group rents out land to other farmers.
- f) Absentee landlords and speculators from urban centres who employ a farm manager (kabraare) and/or a local resident of their confidence to supervise the production. Former residents of the villages, who live permanently in urban centres, also proceed in this way. They invest in agriculture to secure their income or to obtain securities for bank credits needed for investments in other sectors of economy.

These categories are based on results of semi-structured interviews carried out in both areas. The different farm groups were approved by key informants but it would need more detailed studies to identify their characteristics or constraints for development activities concerning the target group.

In Project Area B there are permanently employed labourers who also work on their own fields for some days a week. There is also a

considerable number of labourers immigrate seasonally from the Bay Region to the riverine areas without their families. They usually work in this zone until the rainy season starts in their area of provenience.

Furthermore it is common practice that a young couple receives a farm plot for a few seasons as a temporary loan from the man's father, who passes it on to the next son who marries for the same purpose.

In both project areas farmers practice various forms of **share cropping** which are characterized by the different contribution of inputs. The most common forms are:

- One person, not necessarily a resident, contributes money to a farmer without means for him to pay all inputs required for production. After the harvest this money is paid back and both sides share the remaining production equally.

This form is practised frequently in Project Area B and is based on verbal contracts approved by testimonies, whereas it is uncommon in Project Area A.

- The employed farm managers (*kabraare*) either are given money or the landlord provides them with a farm plot where he pays all inputs and leaves the harvest to his employee.

There also exist some variations of input contributions such as:

- A large-scale farmer pays all expenses for the construction or maintenance of a canal and shares the water with small farmers. In return, these farmers are expected not to oppose him and they are to be available as labourers on the large-scale farmer's fields.

The socioeconomic data, gathered from the semi-structured questionnaire and the open interviews, indicate that the farms in both project areas can be divided into different categories of "farms"¹⁾. The underlying thesis that farm size would be an adequate basic criterion was confirmed by the results. The classification considers only those farmers whose major source of income is crop production.

1) Although in Somalia the term "farm" is used for the cultivated land only, it is used here in the sense of "farm enterprise".

Table 9: Types of Farms

Criteria	Size of "Farms"			
	up to 1 ha	1 to 3 ha	3 to 10 ha	over 10 ha
Production	subsistence	subsistence	market	market
Main crops:	maize	maize	maize	maize
in gu'	maize/sesame	sesame/maize	sesame	sesame
in dayr	gravity	gravity	gravity/ pumps	gravity/ pumps
Irrigation				
Farm work:				
done by	family	family	family/lab.	labour
Source of Income:				
- H H	labour/farm	farm/labour	farm	farm/ invest. of surplus
- wife	labour	HH/labour/ boombe/ani- mals	HH/boombe/ own land/ animals	HH/own land
Land owner- ship	rented in/ own	own/ rented in	own	own/ rented out
Registration	no	seldom	few	frequent
Livestock:				
- poultry	few	common	common	common
- sheep/goat	seldom	few	few	few
- cattle	few	common (family use)	frequent (family & market)	frequent (market/ saving)
Credit:				
- source	shop	shop/private	shop/bank	bank (B)
- used for	food	food/inputs	input/invest	input/ invest.
Use of:				
- machinery	ploughing	ploughing/ transport	ploughing/ transport/ threshing	ploughing transport threshing
- chemicals	uncommon	pesticides	pest./herb./ fertil. (B)	pest./herb fertil. (B)

HH = Household Head; (B) = Project Area B
Source: ZELF Team 1989

These empirical observations were confirmed by the interviewees. The thesis that the farms in both project areas should be differentiated in four groups could also be proved positively by the 385 formal interviews carried out in the SHIRA Project Area by the ZELF Team. The

data of these questionnaires are the bases for the quantitative analysis and discussion of the structure of the various farm types. The findings are summarized in the following tables:

Table 10: General data of Area A

Size of the sample: 235 households

	Types of Farms			
	0 - 1 ha	1 - 3 ha	3 - 10 ha	over 10 ha
Stratification of the sample :	64 %	23 %	10 %	3 %
Distribution of Farm enterprises :	48.3 %	39.5 %	5.9 %	4.3 %
Average farmsize :	0.73 ha	1.98 ha	5.55 ha	43.00 ha
(Mean variation :	0.25 ha	0.53 ha	2.11 ha	40.36 ha)
Fallow land :	10 %	10 %	16 %	32 %
No. of farm plots:	1.19	1.54	1.83	1.33
Farmers who rented land :	37.5 %	20.3 %	25 %	0
Rented area :	0.34 ha	0.44 ha	1.13 ha	0

Source: ZELF Team 1989

Table 11: General data of Area B

Size of the sample: 150 households

	Types of Farms			
	0 - 1 ha	1 - 3 ha	3 - 10 ha	over 10 ha
Stratification of the sample :	24 %	44 %	26 %	6 %
Distribution of Farm enterprises :	3.3 %	69 %	19.7 %	8 %
Average farmsize :	0.74 ha	2.11 ha	6.16 ha	26.67 ha
(Mean variation :	0.24 ha	0.58 ha	1.73 ha	17.04 ha)
Fallow land :	5 %	19 %	36 %	42 %
No. of farm plots:	1.04	1.25	1.73	1.5
Farmers who rented land :	38.4 %	10 %	7 %	n.a.
Rented area :	0.34 ha	0.24 ha	0.6 ha	n.a.

Source: ZELF Team 1989

The areas reported to be fallow are mostly not worked owing to lack of money for inputs, floods caused by the river and insufficient labour availability, but this data should be used with caution as they are rough estimates given by the interviewees.

The analysis of the results shows considerable differences in both project areas. The majority of farm enterprises of Area A are smaller than those of Area B, where agricultural crop production has existed for a longer period. In Area A there are more new settlers starting production on rented land with farm plots mostly smaller than one hectare.

4.3 Plant Production Characteristics

4.3.1 Type of Crops and Cropping Pattern

The socioeconomic study reveals that farm ownership is common among approx. 85% of the farmers in the SHIRA Project Area engaged in subsistence agriculture. In the recently settled areas of Project Area A newly immigrated farmers start production on farm plots they rent from farmers with 5 and more hectares. The rent to be paid for 1 dharab (0.25 to 0.33 ha) varies from 4,000 to 5,000 So.Sh. for land with good access to water and 2,000 to 3,000 So.Sh. for farmplots far from the river. The rents have to be paid for each cropping season. It is a matter of negotiation whether to pay in cash or in kind after the harvest.

In both areas maize (varieties: Somali landrace, Somtox) is by far the most commonly grown crop under all conditions and the staple cereal food for the population. It can be grown in both seasons, but in gu' it is almost the only crop. Besides the grain, also the residues are of importance: the cobs are used as fuel and the stalks are either fed to nomadic livestock or sold for feeding purposes to Mogadishu. The next most important crop is sesame (autochthonous variety). It is usually grown in the dayr season but occasionally also in xagaa, in order to obtain new seeds for the following season. Sesame is regarded as a cash crop, sold as seed or locally processed to oil. The dry residues are also used for covering buildings (Area A) and the oil cake is in great demand as fodder for cattle. Presently are generally grown two types of tomato. In Area B many farmers have contracts with the tomato processing factory in Afgooye, ITOP, which introduced and supervises the growing of a paste-type tomato (varieties: Roma VF, Summer Sun). The production of these varieties is considered to be labour-intensive and the risks of marketing are high, because of insufficient processing capacities of ITOP or fluctuating market prices, since they are influenced by the management of ITOP²). The more frequently grown tomato is the round, thin-skinned cherry type. It cannot be processed by ITOP, but has a high demand on the markets. The risks of its production are reduced since its requirement for regular irrigation is less and it can be harvested within a period of approximately two month. It is also more resistant to diseases. Water melons are grown in dayr and harvested at the beginning of jilaal. The fruits have a good market in urban centres and used to be sold up to Northern Somalia. Fruit trees are of increasing importance in Project Area B as cash crops but only for local or private use in Project Area A (Lime, Grapefruit, Mango, Coconut). Other crops grown are cowpeas and mungbeans, intercropped with maize (preferably by female farmers), chilli, sweet pepper, salad, pumpkin and onions (varieties: Bombay red, Texas). Groundnuts are basically grown in the area of the village

2) Many farmers complained that ITOP is the only factory processing this product and the management manipulates the price by rejecting tomatoes which are not delivered by their contractors and by allowing those contractors who received their inputs (seeds, agrochemicals etc.) first, to sell their products on the market, in order to satisfy the demand and to influence the price paid to the other contractors.

Banaaney, where this crop is produced as cash crop production as well as for own consumption. There are tendencies to start local groundnut processing activities in this village.

The general pattern is that farmers grow maize during the gu' season to meet the families' needs for basic food. Furthermore, they grow sesame for cash in the dayr season (statement: "We grow food in gu' and money in dayr"). In both project areas no farmer reported regularly leaving a share of his land fallow in order to regain soil fertility. Fallow plots have not been cultivated because of lack of means, delays of cultivation, due to lack of tractors for land preparation or high labour cost and lack of water.

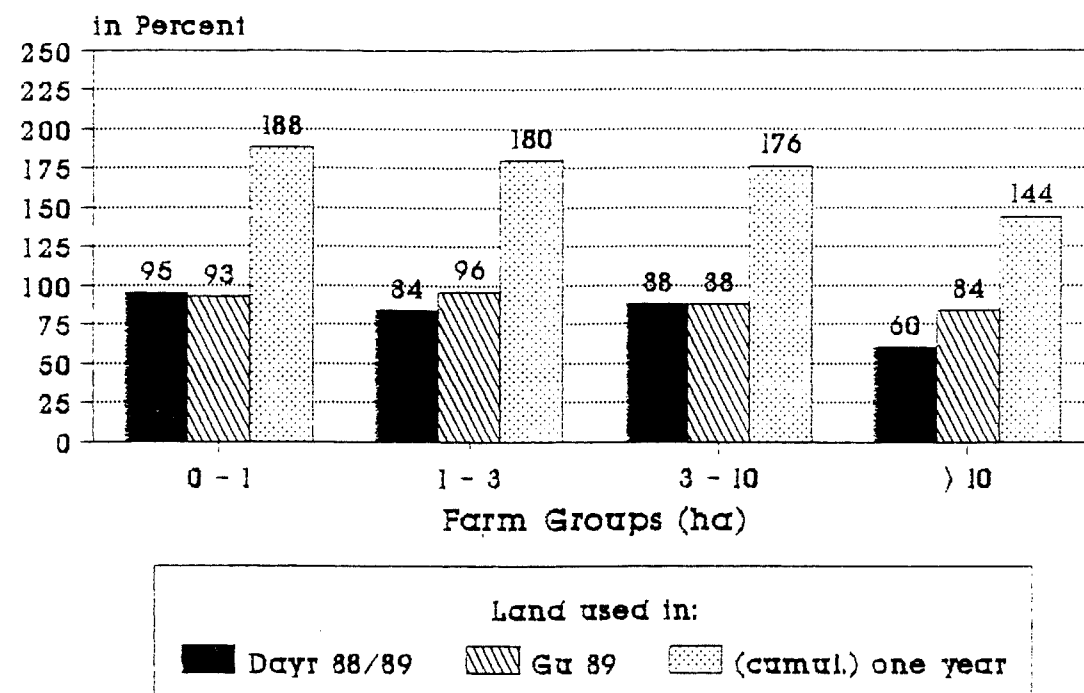
In all villages maize is the predominant crop in gu'. Only few farmers diversify their production by growing tomatoes, sweet potatoes or cow peas in this season. The findings of the study do not show a correlation between diversification and farm size but between diversification and family labour, availability of water and knowledge of producing these crops in gu'. The village of Banaaney is an exception, growing groundnuts on approx. 20% of the cultivated land in this season. The following tables and figures show the different pattern of land use in the two production periods of one year.

Table 12: Land use in Area A (in percent)

Season/Crop	Types of Farms			
	0 - 1 ha	1 - 3 ha	3 - 10 ha	over 10 ha
Dayr 88/89:				
- Maize	26	25	25	10
- Sesame	65	56	60	43
- other	4	3	3	7
Subtotal	95	84	88	60
Gu 89:				
- Maize	90	86	78	81
- Sesame	1	1	1	1
- other	2	9	9	2
Subtotal	93	96	88	84
Total	188	180	176	144

Source: ZELF Team 1989

Figure 8: Land use in Project Area A



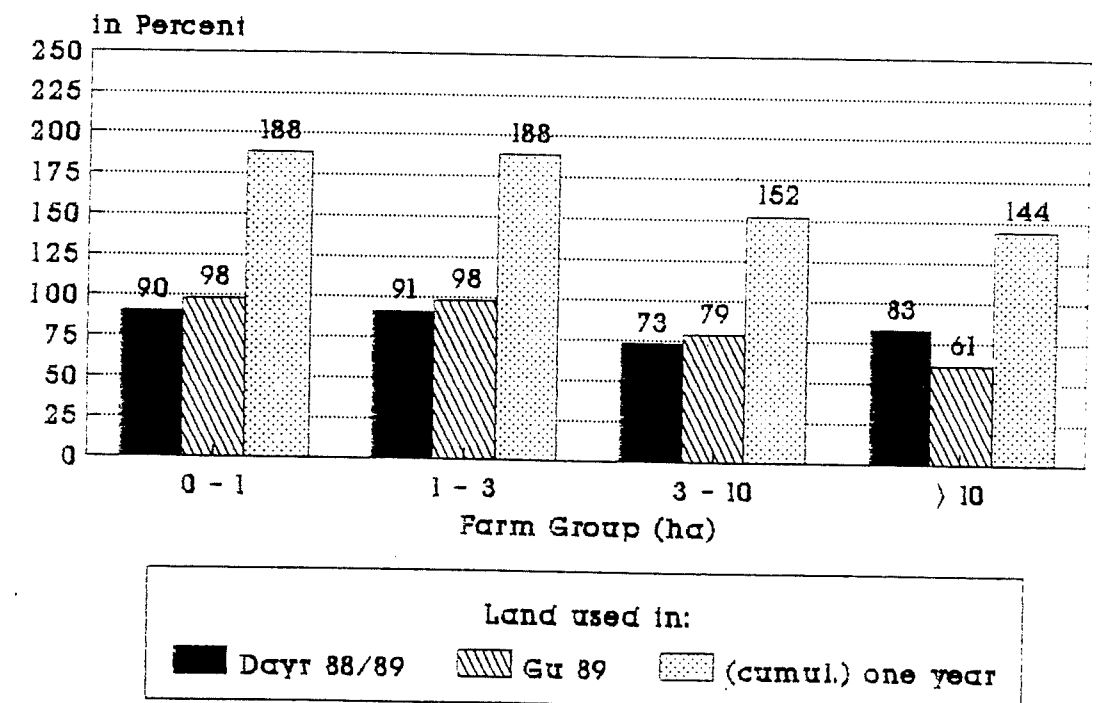
Source: ZELF Team 1989

Table 13: Land use in Area B (in percent)

Season/Crop	Types of Farms			
	0 - 1 ha	1 - 3 ha	3 - 10 ha	over 10 ha
Dayr 88/89:				
- Maize	22	18	20	13
- Sesame	63	68	50	60
- other	5	5	3	11
Subtotal	90	91	73	83
Gu 89:				
- Maize	98	94	79	56
- Sesame	0	1	-	-
- other	0	3	-	5
Subtotal	98	98	79	61
Total	188	188	152	144

Source: ZELF Team 1989

Figure 9: Land Use in Project Area B



Source: ZELF Team 1989

The data in Table 12 and 13 can vary since the estimates of fallow land have to be regarded with caution and moreover the area under cultivation could not be measured by the ZELF Team.

The data of the study show that smallholders with less than 2 ha (approx.) grow sesame and maize in the dayr season if the previous harvest had been insufficient for the family. Only few smallholders of this category tend to diversify their production by growing tomatoes, water melons or onions. Farmers with more than 2 ha preferably grow

sesame as cash crop and increasingly diversify their production by growing tomatoes, water melons, onions and vegetables for external markets.

The percentage of land used for other crops than maize and sesame differs and cannot be quantified as it generally depends on individual decisions considering water availability, knowledge, access to inputs, and market prices.

4.3.2 Labour, Time and Input Requirement

In both project areas agricultural production became increasingly individualized and the traditional forms of self-help groups lost their former importance. At present only farmers with less than 1 ha and female farmers still use these forms but tend to avoid them because the practice of providing food to the groups during the working time usually costs more than employing labour.

In Project Area B the crop production in general is more advanced since the farmers have a longer tradition of agricultural production on irrigated land. It has also not been reported that those groups which work as labourer suffered from starvation in recent years, unlike the same groups in Project Area A, who regularly starve before the harvest periods.

Table 14: Agricultural Activities by Crop and Month

Month	Maize	Sesame		Tomatoes
		xagaa	dayr	
March	: land prep.	-	-	-
April	: seeding	-	-	-
May	: seeding irrigation weeding	-	-	-
June	: irrigation weeding	-	-	nursery
July	: irrigation weeding	light cultivation	-	nursery land prep. irrigation transplan.
August	: harvest stalking peeling	irrigation seeding	-	(as July) weeding
September	: harvest stalking	irrigation seeding	-	weeding irrigation harvest
October	: irrigation seeding	weeding	land prep. irrigation	weeding/ irrig./har.
November	: irrigation weeding	harvest	irrigation seeding	harvest
December	: weeding harvest	harvest threshing	weeding	harvest
January	: harvest	-	weeding	-
February	: -	-	harvest threshing	-

Source: ZELF Team 1989

Table 14 represents the cropping pattern given by the interviewees. Their data on this matter were more general since the cropping patterns during the different periods can vary according to the cropping conditions and constraints.

Much of the land preparation of irrigated lands is increasingly done by tractors, whereas secondary tillage, weeding, harvesting are hand operations. Threshing of small quantities is also done by hand, but more farmers (Project Area B) rent a threshing machine for their maize to process the harvest and to fill it in sacks or barrels, for selling or storage purposes. The threshing machine makes the traditional groundpits obsolete, because it requires the maize to remain on the

cob. At the same time the demand for agrochemicals increases although the farmers have very little experience in using them.

With the methods and techniques presently used in agriculture in both areas the time requirement for crop production is considerable. If the work in agricultural production is done by hired labour a working day is commonly considered to be 5 hours (7⁰⁰ to 12⁰⁰), including the way to the field. During work peaks labour is also hired in the afternoon for usually 3 hours (15⁰⁰ to 18⁰⁰).

Table 15: Time Requirements (Project Area A)

Work	Time needed per unit (h/ha)	when done by
Land clearing	300	hand
Ploughing	3.5 - 4	tractor
Cultivating (after ploughing)	4	1 labourer
Land preparation (hoeing by hand)	150	1 labourer (5h/day)
Canal cleaning	5 h / 25 m	1 labourer
Irrigation	3 - 12	3 labourers
Seeding (together with ploughing)	3.5 - 4	2 labourers,
Seeding maize	15	1 labourer
sesame	21	1 labourer
potato	125	1 labourer
Subdivision into:		
jibaal	6	2 labourers
moos	13.5	2 labourers
1. Weeding	90 - 110	1 labourer
2. Weeding	55 - 80	1 labourer
3. Weeding	30 - 40	1 labourer
Application of basudine	6	1 labourer
Spraying herbicides	10	1 labourer
Thinning	10	1 labourer
Filling gaps in the rows	10	1 labourer
Harvest (cutting)	18 - 24	1 labourer
Uprooting (sesame)	30 - 35	1 labourer
Peeling	4 q /day	1 labourer
Threshing (maize)	1 q /day	hand
(sesame)	50 q /day	machine
	5 q /day	hand

Source: ZELF Team 1989

Table 15 indicates the average time required in both project areas to complete the different phases of production.

The payment arrangement varies according to the kind of work. There are basically two types of arrangements: the fixed price for a land unit to be worked on (contratto) or payment for one working day (giornati). The costs listed in the following Table 16 vary according to the availability of labour and the general costs of living.

Considering the seasonally increasing costs of labour, farmers tend to use machinery.

Table 16: Machinery and Labour Costs (Project Area A)

Work	Unit	Price per Unit	Comment
	So.Sh.	(US \$)	
Land clearing	1 h	3500	7.0 bulldozer
Ploughing	1 h	1500	3.0 ONAT
		2500	5.0 private
	1 ha	8750	17.7 (3.5 h)
Diskharrow	1 h	2200	4.4
	1 ha	3300 - 4400	6.6 - 8.9 (1.5 - 2 h)
Subdividing in:			
- moos	1 ha	4050	8.1 3 labour / 1350 SoSh each tractor
- jibaal	1 ha	1500	3.0 tractor
Canal cleaning	10 m	300	0.6
Water distribution	12 h	700	1.4 by day
	12 h	1000	2.0 by night
	1 ha	2100 - 3000	4.2 - 6.0
1. weeding	1 ha	20000	40.4 (maize)
2. weeding	1 ha	12000	24.2 (maize)
3. weeding	1 ha	4500	9.1 (maize)
Watching	30 days	5000	10.1
Harvesting	1 ha	4000	8.0 (maize)
Husking	1 q	100	0.2 (maize)
Transport	1 lorry	1000 - 1500	2.0 - 3.0 (30 to 40 q)
Threshing	1 q	150	0.3

(Exchange rate August 1989: 1 US \$ = 494.12 So.Sh.)

Source: ZELF Team 1989

The information listed in Table 17 was provided by a group of farmers who consider themselves to be good farmers. The time required can therefore vary according to the conditions and the physical constitution of the labourer.

Table 17: Time Requirements (Project Area B)

Work	Time needed per unit (h/ha)	when done by
Land clearing	6	bulldozer
Ploughing	3.5	tractor
Hoeing	8	(after the tractor)
	12	(after first gu' rain)
Canal cleaning	5 / 25 m	1 labourer
Seeding	8	1 labourer (with hoe)
	3.5	2 labourers (after ploughing by tractor)
Thinning	16	(if done separately from weeding)
Planting	53	
Subdivision in:		
- jibaal	6	2 labourers
- rubah	12	2 labourers
1. Weeding:		
- maize	24	1 labourer
- sesame	24	1 labourer
- tomato	24	1 labourer
- onion	24	1 labourer
2. Weeding:		
- maize	10.5	1 labourer
- sesame	10.5	1 labourer
- tomato	10.5	1 labourer
- onion	24	1 labourer
Harvest:		
- maize	9	1 labourer
- sesame	12	1 labourer
- onion	9 - 12	1 labourer
Stalk collection:		
- maize	3	1 labourer
- sesame	4	1 labourer
Heaping the stalk:		
- maize	4	1 labourer
- sesame	4	1 labourer
Application of:		
insecticide	8	1 labourer
Peeling (maize)	0.5 /q	1 labourer (by hand)
Threshing (maize)	1.5 /q	1 labourer (by hand)

q = Quintal (approx. 100 kg or dry measure of one sack)
Source: ZELF Team 1989

In Project Area B the availability of labour is higher than in Area A. The traditional linkages to the interriverine region, where most seasonal labourers come from, and the better living conditions make this area more attractive for labour although the wages are slightly lower than in Area A.

Table 18: Machinery and Labour Costs (Project Area B)

Work	Price per hectare		
	So.Sh./ha	US \$/ha	
Land clearing	21000	42.5	bulldozer
Ploughing	2500 - 3000	5.0 - 6.0	tractor
Hoeing	4800	9.7	in jilaal
	24000	48.5	after first gu rain
Canal cleaning	600 /25 m	1.2	
Seeding	3200	6.4	by hoe
	1500	3.0	while ploughing
Thinning	2400	4.8	if done separately
Planting	44800	90.6	(e.g. tomato)
Subdivision in:			
- jibaal	2600	5.2	
- rubah	4000	8.0	
1. Weeding:			
- maize	12800 - 19200	25.9 - 38.8	(prices increase
- sesame	12800	25.9	according to the
- tomato	11200	22.6	hardness of work and
- onion	19200	38.8	the amount of weeds)
2. Weeding:			
- maize	9600	19.4	
- sesame	6400	12.9	
- tomato	6400 - 8000	19.4 - 16.1	
- onion	12800	25.9	
Harvest:			
- maize	3600	7.2	
- sesame	9000	18.2	
- onion	12800	25.9	
Stalk collection:			
- maize	3000	6.0	
- sesame	2400	4.8	
Heaping the stalk:			
- maize	900	1.8	
- sesame	3000	6.0	
Application of:			
insecticide	1800	3.6	
Digging bakar			
(for 30 q)	4500	9.1	
Peeling (maize)	200 / q	0.4	
Threshing (maize)	150 / q	0.3	

(Exchange rate August 1989: 1 US \$ = 494.12 So.Sh.)

q = Quintal (approx. 100 kg or dry measure of one sack)

Source: ZELF Team 1989

Besides paid employment of labour an increasing number of farmers also use other inputs like agrochemicals, fertilizer, improved seed at considerable costs. Moreover, due to problems of their availability, the traditionally used inputs as well as the equipment still play an important role.

Table 19: Price and Use of Inputs (1989)

Input	Price (So.Sh.)	(US \$)	amount used
Agrochemicals:			
- herbicide ('88)	650 - 1.000 /l	(1.32 - 2.02)	4 l / ha
('89)	1.500 - 2.200 /l	(3.04 - 4.45)	
- insecticide	900 - 1.000 /kg	(1.82 - 2.02)	n.a.
- fertilizer ('88)	4.300 /0.1t	(8.70)	n.a.
('89)	10.500 /0.1t	(21.25)	n.a.
Seeds:			
- maize	20.000/0.1t	(40.48)	20 kg / ha
- sesame	(own seeds)		6 - 7 kg / ha
- tomatoes	n.a.		0.125 kg / ha
- cow peas	235 /kg	(0.48)	40 kg / ha
- onion	6.000 /kg	(12.15)	0.375 kg / ha
- (sweet) pepper	17.000 /kg	(34.41)	0.390 kg / ha
Trad. Equipment:			
Hoe	1.000	(2.02)	
Holoto	100	(item to clean the hoe)	
Kawaawa	1.500	(3.04)	
Sickle	500	(1.01)	
Axe	1.500	(3.04)	
Machete	1.200	(2.43)	

(Exchange rate August 1989: 1 US \$ = 494.12 So.Sh.)

n.a.= not available

Source: ZELF Team 1989

The prices listed in the table above can be regarded as average figures. The quantity used by the farmers could not be measured by the ZELF Team and the amount can vary since these data were provided by interviewees according to their experiences. Also the prices are subject to change because they depend on the availability of the products in the urban centres, the regional markets or the local shops. Only few farmers are aware of the danger that might arise from the incorrect application with agrochemicals. The traders, too, do not store these products in separate place, away from food.

4.3.3. Yields

The yields of the crops cultivated in both project areas can vary considerably. According to the interviewed farmers the main factors for the variation of yield are: lack of water, flooded fields, losses through insects (maize), losses through humidity (sesame), lack of labour during working peaks, poor availability of inputs and mistakes of cultivation.

Table 20: Yields in Crop Production (1988 - 1989)

Crop	Yield (t/ha)		average yield Somalia (t/ha)*
	bad	good	
Maize	1.5	2.5	1.26
Sesame	0.15	0.5	0.42
Tomato	0.2	0.5	n.a.
Cow pea	0.3	0.7	0.23 (beans)
Groundnut	0.5	1.0	0.86
Onion	1.0	3.0	n.a.
Sweet potato	1.0	4.0	n.a.
Water melon**	100	300	n.a.

* Source: Yearbook of Agricultural Statistics 1988/89

** in pieces

Source: ZELF Team 1989

The data of Table 20 must be viewed with caution because they are based on reports given by farmers and could not be cross checked by measurements of the ZELF Team.

The results of the socioeconomic study did give evidence that there is a correlation between farm size and yield. The following tables show the average yield within the four groups and also list the mean variations of the yield of the farmers. These differences are due to problems of production such as lack of water on the individual farm plots, lack of labour or inundation of the fields caused by the flood of the river and inadequate irrigation infrastructure (low river dam, poorly designed outlets, damage in the canal system).

Table 21: Yields of Different Crops (kg/ha) in Area A

Season/Crop	Types of Farms			
	0 - 1 ha	1 - 3 ha	3 - 10 ha	over 10 ha
Gu 88:				
- Maize	1290	1028	578	1019
- (mean variation	751	935	316	313)
- Sesame	-	-	-	-
Dayr 88/89:				
- Maize	950	702	975	-
- (mean variation	412	426	501	-)
- Sesame	383	310	320	193
- (mean variation	254	182	206	159)
Losses:				
- Maize	36 %	29 %	33 %	20 %
- Sesame	59 %	62 %	64 %	44 %

Source: ZELF Team 1989

Table 22: Yields of Different Crops (kg/ha) in Area B

Season/Crop	Types of Farms			
	0 - 1 ha	1 - 3 ha	3 - 10 ha	over 10 ha
Gu 88:				
- Maize	1296	735	622	470
- (mean variation	1111	423	373	187)
- Sesame	-	-	-	-
Dayr 88/89:				
- Maize	970	820	531	-
- (mean variation	530	320	279	-)
- Sesame	435	426	460	197
- (mean variation	287	326	322	177)
Losses:				
- Maize	21 %	23 %	22 %	19 %
- Sesame	20 %	28 %	19 %	16 %

Source: ZELF Team 1989

The data mentioned in the Tables 21 and 22 are based on quantities provided by the interviewees since the ZELF Team could not measure in the fields owing to lack of time.

4.4 The Livestock Sector

4.4.1 Some Comments on Livestock Keeping and Production

In both project areas livestock is of great importance as animals are kept to supplement the diet or to diversify the income. Livestock is also used to invest and save surplus deriving from crop production or trading.

There are basically three forms of livestock keeping:

- Livestock kept in the villages throughout the year and herded in close vicinity to the settlements;
- livestock kept in a range of 5 to 50 km and often even up to approx. 200 km north of the Shabeelle valley in the interriverine zone;
- nomads coming with their livestock to the river valley during the dry season (jilaal season).

The animals kept in the villages (a) are chicken, few goats and sheep and cattle. There is a significant difference between both project areas concerning animal keeping. In Area A 45 to 85 % of the households have cattle (lactating cows, calves, bulls) whereas in Area B only 25 to 50 % of the households keep cattle in the settlement. Goats and sheep are of minor importance but chickens are kept frequently. The livestock kept in the village is managed by the women and guarded by hired herdsmen (qowsaar) or the children of the owner during the daytime when grazing in close vicinity to the settlement (mofoofta).

Livestock kept outside the village (jil) (b) could not be quantified because data of the herd size are withheld¹⁾. The animals are usually looked after by nomads engaged as paid herdsmen and often assisted by a wife of the owner. She is concerned with processing and marketing the animals' products in the settlements nearby their path of migration.

During the jilaal season nomads (c) come to the riverine areas in order to water their livestock, to use the riverine grazing land as well as crop residues for their animals and to refurnish their stock of agricultural products. They are of importance to the economy of the respective villages as they increasingly buy fodder for their animals, sell livestock to farmers and traders and buy groceries in larger quantities. Moreover they also herd animals of those farmers who keep livestock for saving purposes.

The information gathered shows that the individual herd size increases with farm income. But since the questioned farmers tend to withhold the exact data concerning their individual herd size, reasonable figures could only be obtained from the livestock kept in the villages.

1) A more detailed survey about the livestock sector could not be carried out as Dr. Janzen did not get the permission to travel to Somalia and do his planned three weeks fieldwork at the end of July and beginning of August 1989.

The quantitative data on the composition of livestock listed below show the present structure of livestock keeping and the amount kept by individual households in the villages.

Table 23: Composition of Livestock kept (% by head)

Area	Bulls		Calves		Sheep		Donkeys		Chickens
	Cows	Oxen	Goats	Camels	Camels	Chickens			
Area A:	29.2	5.2	2.1	21.4	2.1	2.6	0	2.6	34.9
Area B:	24.4	9.1	1.9	16.3	1.9	1.9	0	0	44.5

Source: ZELF Team 1989

Table 23 shows the general composition of livestock kept in the villages. Project Area A has a stronger nomadic tradition represented by the higher number of cattle kept whereas in Project Area B animals are more likely kept to meet the daily needs of the family (e.g. milk, eggs). Both areas have in common that detailed figures have not been available about the livestock kept outside the villages. These data are kept secret since farmers are frequently forced to contribute cattle to the formal authorities (Area A) or the owners do not want to reveal the number of livestock kept for saving purposes (both areas).

In both areas there are variations in ownership in the kind of animals most likely kept within the reach of the villages.

Table 24: Likelihood of Ownership of Various Animals (% by head)

Area	Bulls		Calves		Sheep		Donkeys		Chickens
	Cows	Oxen	Goats	Camels	Camels	Chickens			
Area A:	70	23	10	67	7	3	0	17	40
Area B:	88	46	8	77	4	4	0	0	38

Source: ZELF Team 1989

Table 24 shows the likelihood of the various animals owned by individual households. Again cattle are of greatest importance to all households, especially lactating cows and their calves which stay in the villages until they can join the herds in the bush.

The average number of the various animals kept in those households which possess livestock differs in both areas.

Table 25: Average Number of Livestock kept by Animal-Keeping Households

Area	Bulls		Calves		Sheep		Donkeys		Chickens
	Cows	Oxen	Goats	Camels	Camels	Chickens			
Area A:	2.67	1.43	1.33	2.05	2	5	0	1	5.58
Area B:	2.22	1.58	2	1.7	4	4	0	0	9.3

Source: ZELF Team 1989

Table 25 shows the average number of animals kept if these animals are owned by an individual household.

Table 26: Prices of Livestock (August 1989)

Type	Price (So.Sh.)	US \$
Camel:		
- mature male	120.000	242.91
- mature female	100.000 - 110.000	202.42 - 222.67
- immature animal	50.000 - 60.000	101.21 - 121.46
Cattle:		
- bull	60.000 - 70.000	121.46 - 141.70
- cow	50.000 - 60.000	101.21 - 121.46
- young cow	30.000 - 40.000	60.73 - 80.97
- calf	18.000 - 20.000	36.44 - 40.49
Goat:		
- male	12.000	24.30
- female	11.000	22.27
- young animals	4.000 - 5.000	8.08 - 10.12
Sheep	10.000	20.24
Chicken	750 - 1.000	1.52 - 2.02

(Exchange rate August 1989: 1 US \$ = 494.12 So.Sh.)

Source: ZELF Team 1989

The prices listed in Table 26 can vary according to the condition of the animal and the season. They increase considerably before Islamic holiday. Trading of animals is usually arranged via a mediator who receives a share of the retail price.

4.4.2 The State of Animal Traction

Unlike in the north-west of Somalia and parts of Ethiopia bordering northern Somalia, animal traction for ploughing is unknown in both areas even though farmers of Arab origin used to employ bulls for farm work at the beginning of this century. Only in the villages of Sheikh Banaaney and Daarasalaam are there farmers who know about their

use and are ready to start with animal traction again. They regard animal traction to be increasingly useful because of the problems involved when using tractors:

- delays caused by inadequate availability;
- insufficient supply of diesel and spare parts;
- increasing rental price due to permanently rising costs for energy and spare parts;
- poor quality of land preparation;
- compressed soil surface if used on humid vertisol soils.

Those farmers who are ready to employ animal traction see several advantages in using animals in comparison to tractors:

- easy availability when needed;
- bulls and oxen are locally available;
- chance of additional income generating activities during the periods of land preparation and high demand for transportation (e.g. harvest, firewood);
- possible use in periods of high labour demand for weeding;
- no dependence on the market for energy and spare parts;
- animals can be sold or slaughtered when they become weak and old.

The findings of the socioeconomic study show that generally farmers are willing to learn how to work with animals but see various disadvantages compared to the use of tractors:

- problems of trypanosomiasis in the riverine area and the nearby bush (up to approx. 5 km);
- poor veterinary services;
- poor availability of adequate medicine for treatment;
- lack of proper equipment for ploughing and weeding;
- doubts whether animals can work the heavy and hard vertisol soils;
- high investment costs if animals have to be bought;
- shortage of adequate fodder in times of high labour demand at the end of the jilaal season.

Since the use of tractors has become increasingly important to all farmers and since the use of animal traction is hardly known the SHIRA Project should promote trials in the villages of Daarasalaam and Banaaney. These trials could include training in improved row seeding techniques in order to use animal traction also for weeding purposes. After successful introduction those farmers participating in the trials should be included in the training of other interested farmers.

4.5 Storage, Marketing and Transportation

In both project areas the storage of staple crops takes place in the same way. The maize is stored in underground pits where it can be kept for years. This technique is used for the families' subsistence requirement until the next harvest or to wait for higher market prices. In Project Area B farmers with market oriented production are increasingly using sacks or barrels to store their products before selling, whereas in Project Area A this way of short-term storage is uncommon. The sesame is stored in containers in the house, since it is traditionally used for selling according to the families' requirements for subsistence.

For both project areas Mogadishu is the main market. The agricultural products are best paid in the capital and farmers transfer their production preferably directly to this market (0.2 t and more). The local markets of the areas, including Qoryooley, have minor importance as prices are considerably lower than in the capital, but farmers use these markets in order to obtain money quickly if needed. The local markets of the villages are most likely frequented by traders from outside or their village representatives buying products in small quantities (up to 1 t). Mainly women are engaged in this village economy selling gradually parts (up to 10 kg) of the family storage to meet the daily needs.

Table 27: Marketing and Storage of Staple Crops (Area A)

Crop	Types of Farms			
	0 - 1 ha	1 - 3 ha	3 - 10 ha	over 10 ha
Marketing:				
- Maize	27	29	51	74
- Sesame	98	95	98	98
Storage:				
- Maize	71	68	47	23
- Sesame	2	5	2	2

(data in percent)

Source: ZELF Team 1989

Table 28: Marketing and Storage of Staple Crops (Area B)

Crop	Types of Farms			
	0 - 1 ha	1 - 3 ha	3 - 10 ha	over 10 ha
Marketing:				
- Maize	15	21	31	68
- Sesame	91	78	78	83
Storage:				
- Maize	79	63	57	31
- Sesame	5	18	16	1

(data in percent)

Source: ZELF Team 1989

It is common practice to give alms to the poor members of the village community or to support relatives with insufficient income living in urban centres. The differences within Table 27 and 28 mostly derive from these facts

In both project areas there are similar patterns concerning the marketing and storage for subsistence of the staple crops. When farmers produce other crops and fruits they usually sell them and keep a share to meet the needs of their household.

The farmgate prices for the harvest fluctuate throughout the year. They are lowest after harvest, increase until the following cropping season and are highest shortly before the next harvest. If possible, farmers sell at periods of high price. Small-scale farmers have to sell their products usually after the harvest because of need of cash income to feed their families, whereas large-scale farmers can afford to store their harvest (e.g. staple crops) for a longer period. As farmers from Project Area B reported, the present conflicts in the northern regions of Somalia influence the marketing of the local produce. The interrupted economic exchange to these territories reduced the demand for sesame oil, water melon and fruits to a considerable extent, estimated to be approximately 40 to 60 %.

Table 29: Crop Prices (1988 - 1989)

Crop	Price per 100 kg	
	So.Sh.	US \$
Maize	6,600 - 30,000	13.36 - 60.73
Sesame	20,000 - 30,000	40.49 - 60.73
Tomatoes	3,500 - 20,000	7.08 - 40.49
Cow peas	n.a.	
Groundnut	4,000 - 7,000	8.08 - 14.17
Onion	30,000 - 70,000	60.73 - 141.70
Sweet potato	2,000 - 4,000	4.05 - 8.10
Water melon*	120 - 300	0.24 - 0.61

(Exchange rate August 1989: 1 US \$ = 494.12 So.Sh.)

* in pieces

Source: ZELF Team 1989

Besides crop production selling of maize stalks and grass becomes increasingly important. Farmers can receive approx. 20,000 So.Sh for maize stalks of one hectare (sold to traders from Mogadishu) and approx. 25,000 So.Sh. for one hectare of good quality grass during the jilaal season.

The transport to the nonlocal markets is run through regular connections of lorries and pick-ups to the major urban centers or provided by traders collecting commodities.

Usually the dry measure and not the weight (see ANNEX 4) is used as the basis for transport fees for agricultural products. The rate which has to be paid can change according to the road conditions and the price for fuel.

Table 30: Transportation Costs

Product	unit	fees to (in So.Sh.)	
Project Area A:			
		Qoryooley	Mogadishu
Maize	1 loor	200	500
Sesame	1 loor	200	500
Onion, Potatoes			
Cow peas	1 loor	200	500
Tomatoes	½ fusto	150	250
Project Area B:			
		Afgooye	Mogadishu
Maize	1 loor	300	400
Sesame	1 loor	300	400
Potatoes	1 juunia	150	300
Tomatoes	½ fusto	200	300
Pumpkin	1 juunia	150	250
Spinach, Salad	1 juunia	150	200
Water melon	1 piece		5
	1 lorry load*		3000 - 3500
Papaya	1 sahar**		200
Lime	1 loor		200
Grapefruit	1 lorry load		25000 - 30000

* 600 to 700 pieces; ** 50 to 150 pieces

Source: ZELF Team 1989

For transportation to the urban centres the use of lorries and pick-ups has an increasing importance for transferring the yield from the field to the village or to the road. In Project Area A animal carts are increasingly replacing women who traditionally did the transportation. The fees which are to be paid increase with the distance from the village.

Table 31: Transportation of Crops

Means of Transport	quantity	price (So.Sh.)
Woman backload	½ loor	150
Animal cart	4 - 6 juunia	350 - 450
Lorry	25 - 35 juunia	1,500 - 2,000

Source: ZELF Team 1989

In all villages which have agricultural areas across the Shabeelle River transportation to the village is expensive. Because of missing bridges one lorry load can cost up to 9,000 So.Sh. (e.g. Daarasalaam for one way via Janaale) not including the taxes which have to be paid when crossing the district border.

Taxation of the agricultural production is related to marketing since the administration usually collects the taxes if products are sold in the market or loaded for transportation. Additionally the commodities are taxed when crossing the district border.

Table 32: Taxes

Taxes for	Amount (So.Sh.)
Agricultural Products	5 % of the market price
Livestock (if sold)	5 % of the market price
Maize mill	2500 p.a.
Sesame mill	1500 p.a.
Farm land (1 ha)	60 p.a.
Family compound	300 p.a.
Shop (small assortment)	2000 p.a.
(large assortment)	3050 p.a.

Source: ZELF Team 1989

Besides these taxes collected by the regional administration, farmers are frequently asked for money contributions and/or livestock for governmental activities to "develop" the region. These fees are usually raised through the tribal headmen, who measures the individual contribution according to the economic capacity of the farmers and transfers the requested sum to the formal authorities.

4.6 Income Generation and Credit

The farmers' income in both areas basically comes from selling part of the harvest, working as labourers (including provision of services), livestock and various other sources of minor importance. Since the infrastructure of the Somali credit system is poorly developed and hardly reaches the riverine villages farmers seldom make use of formal credits through banks etc. According to empirical observations only large-scale farmers or owners of registered farm plots take advantage of the formal credit system. Those farmers who do not qualify for formal credits are provided with short-term credits by traders and local shop keepers or these farmers are able to buy on tick.

Table 33: Income and Credit (Area A)

	Types of Farms			
	0 - 1 ha	1 - 3 ha	3 - 10 ha	over 10 ha
Sources of income:				
- Harvest	49 %	61 %	74 %	69 %
- Labour	44 %	27 %	20 %	21 %
- Livestock	4 %	6 %	4 %	8 %
- other	3 %	6 %	2 %	2 %
Average Cash income p.a.:				
So.Sh.	108,461	162,359	327,933	2,031,333
US Dollar	220	329	664	4,111
Average Credit p.a.:				
So.Sh.	4,641	4,636	18,444	-
US Dollar	9	9	37	-

(Exchange rate August 1989: 1 Us \$ = 494.12 So.Sh.)

Source: ZELF Team 1989

Table 34: Income and Credit (Area B)

	Types of Farms			
	0 - 1 ha	1 - 3 ha	3 - 10 ha	over 10 ha
Sources of income:				
- Harvest	68 %	70 %	84 %	83 %
- Labour	25 %	16 %	8 %	6 %
- Livestock	-	-	-	-
- other	3 %	4 %	8 %	11 %
Average Cash income p.a.:				
So.Sh.	48,850	122,108	238,036	578,500
US Dollar	99	247	482	1,171
Average Credit p.a.:				
So.Sh.	17,626	24,518	41,980	65,550
US Dollar	36	50	85	133

(Exchange rate August 1989: 1 Us \$ = 494.12 So.Sh.)

Source: ZELF Team 1989

The data concerning the cash income have to be seen with caution, since the farmers are hardly aware of their actual figures or do not

want to reveal these information. Both areas have the trend in common that the smaller the farms are, the more likely farmers have to seek for additional sources of income. A similar trend can be seen for the use of credits but with the difference that farmers of Area B have better access to money.

In both areas credits are available from formal and informal sources. The formal credits are provided either by programmes of development aid or through Somali banks. The informal credits are provided within kinship networks, by friends, neighbours and traders.

Formal credits: The most important, donor supported, formal credit scheme is supported by funds and personnel of the United Nations Capital Development Fund (UNCDF) and is operated by the Commercial and Savings Bank of Somalia (CSBS) assisted by AFMET extension agents. This programme provides credits for seasonal inputs and land preparation. Presently this credit scheme is operated only in Project Area B in the villages of Aw Dheeglo, Daarasalaam and Mubaarak. To obtain this support, the participants are subdivided in groups of approximately 50 farmers who elect one headman in charge of the formal procedure. These headmen choose one of them to maintain the contact to the institutions.

The current interest rate applied in this programme is 18 % and the credit is to be paid back after one season. The recovery performance is currently running at over 90%.

Informal credits: Informal credits are widespread in both project areas. They are frequently used by small-scale farmers before the harvest period to buy food and before the period of land preparation to pay services and inputs. The money is usually borrowed from shopkeepers and traders who in most cases ask repayment after the harvest in terms of farm products valued according to negotiations. The equivalent is mostly valued below the market price.

In Project Area A creditors also use the mahruun credit system, originally introduced by Arab traders:

The debtor who receives a loan has to pawn farm land to the creditor. The amount asked for security is a matter of negotiation but the creditor usually ask one dharab for 10,000 to 20,000 So.Sh. He uses this land for his own purposes until the loan is paid back (Originally the debtor could continue to use his land). The period of repayment is a matter of negotiation, commonly including the farmers will loose his land if he cannot pay back in time (modification practised in Cabdi Cali and Maanyo Faarax). In most other villages this system is not accepted since it is regarded to be against Islamic law and too unfavourable for the farmers.

In both project areas there are considerable differences concerning the investment in agricultural production. The information provided by the interviewees proved to be unsuitable for listing in a table. Generally the majority of farmers do not know the amount of money they use for investment purposes. In most cases they are only aware of the most recent expenditure or the costs arising regularly, such as costs for tractor services.

5. FEMALE FARMERS

The female farmers of both project areas have to be regarded as essential for the local economy. A large part of the development of the villages depends on them as they are fully integrated into the economy and the agricultural production. Their contributions consist of:

- working in agricultural production;
- managing the livestock kept in the village;
- producing handicrafts;
- trading;
- providing the family with water and firewood;
- being mother and housewife and
- household activities.

In most villages women also have land either inherited from their parents or from their husbands or received as a gift. It is common that women whose husbands own more than 1 ha but below 10 ha are given a farm plot (boombo) at their disposition.

Generally women regard themselves also responsible for the family farm as they work on it. They take part in decisions concerning production. They manage the work of hired labour and they are in charge of the production once it is in the compound (e.g. storage, food consumption, retail trade to meet family needs).

Women are responsible for animals kept in the compound except for buying and selling them if they belong to their husbands. But if female farmers possess their own livestock, on average they have 10 to 12 chickens, 5 to 10 head of cattle or both. The gains from her own animals are at the woman's disposition.

5.1 Female Economy

A considerable number of women work on land which is at their disposition. According to Islamic law women inherit half the share of men but only a minority takes advantage of this regulation in case they received agricultural land. It is common practice that they prefer to accept a compensation from their brothers according to the actual value of the land inherited in order to keep this agricultural land within their original family.

Therefore only a minority of female farmers own land, but many women have access to land provided for them by their husbands (boombo). The women alone are responsible for the production on this land and they decide about the cropping pattern and the use of the gains, which are at their disposal.

Analysis of the results shows differences in both project areas concerning land belonging to women and the use of the income.

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A considerable number of women work on land which is at their disposition. According to Islamic law women inherit half the share of men but only a minority takes advantage of this regulation in case they received agricultural land. It is common practice that they prefer to accept a compensation from their brothers according to the actual value of the land inherited in order to keep this agricultural land within their original family.

Therefore only a minority of female farmers own land, but many women have access to land provided for them by their husbands (boombo). The women alone are responsible for the production on this land and they decide about the cropping pattern and the use of the gains, which are at their disposal.

Analysis of the results shows differences in both project areas concerning land belonging to women and the use of the income.