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SOMALIA AGRICULTURE SECTOR STRATEGY

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I. AGRICULTURAL IN A DROUGHT PRONE ECOLOGY

As is the case for many African countries the dominant characteristic of Somalia is its drought prone ecology. While the reliability of rainfall data is questionable, the available evidence, including interviews with farmers operating small and medium scale irrigated and dry land farms, is that at least four out of ten growing seasons over a five year period will produce less than a satisfactory rainfall with at least one season having a very poor rainfall. Thus four out of ten crops will be partial or nearly whole failures. For the other six growing seasons, the rains will usually produce a very good crop one season and adequate crops five seasons. 1/ Schmidt 2/ cites analysis by Van der Poel 3/ which states that:

"1. Lack of adequate rainfall can be expected to result in crop failures more often than three out of ten years during the gu season. For the der season an even higher percent of crop failures can be expected.

"2. In both gu and der seasons a 100 day crop will in more than 50% of the years suffer from water shortages, especially in the first and last weeks of the growing season." 4/

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- 1/ For areas in the north having on long growing season per year as pattered prevails.
- 2/ D.R. Schmidt, "A Report for the Bay Region Agricultural Development Project, May, 1981, Mimeo.
- 3/ Piet van der Poel, "Summary of Meteorological Data for Somalia", FAO Project SOM/72/014--Strengthening Agricultural Research, April, 1978, Mimeo.
- 4/ D. R. Schmidt, Op. Cit. p. 3.

This variability in rainfall from season to season and year to year causes wide fluctuations in crop production and in the number of livestock. Chart No. 1 shows estimates of production variability from year to year in Somalia for sorghum and maize. It is based on available data on crop production from the Ministry of Agriculture, crop procurement data from the Agriculture Development Corporation and information supplied by American and Somali extension agents and Somali farmers. It presents a reasonably accurate schema of the way in which basic food grain production in Somalia varies with rainfall. While it would be possible to derive a trend line for production during the eleven years time period, such a trend would be largely meaningless. The dominant factor affecting agricultural output and domestic food availability in Somalia is wide variability in production which is directly related to rainfall.

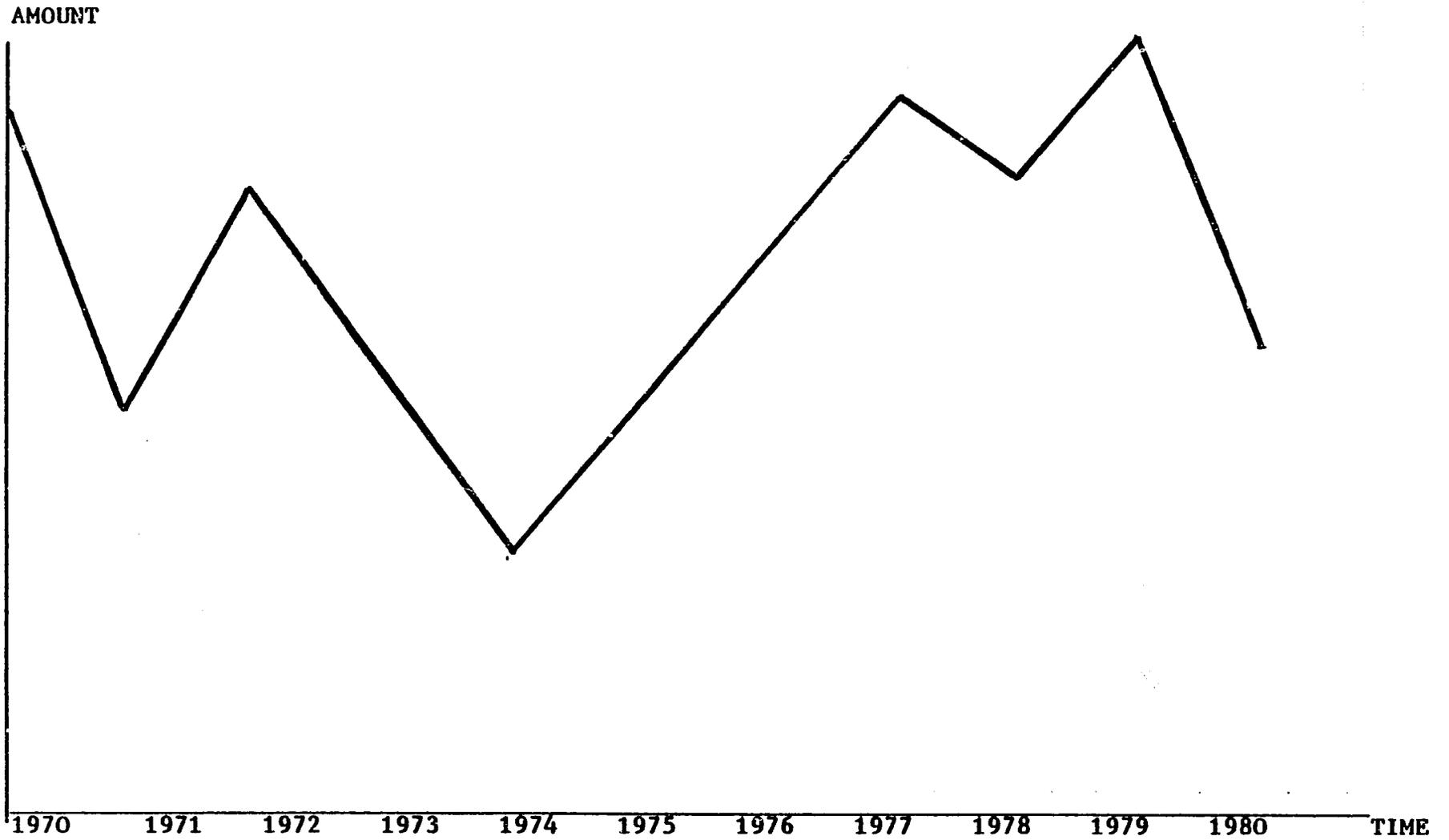
In this situation the overriding socio-economic concern of the Somalia government and the Somalia people must be food security. Because of this the major objective of the farmer or herdsman is risk aversion. Within this constraint and the available level of technology he may seek to maximize production and income, but it is always within the limits imposed by minimizing risk. It is from this perspective of the dominance of drought and the farmers' and herdsman's overriding concern with risk aversion to achieve food security in a drought prone ecology that the agriculture sector will be analyzed in this paper.

A. Social and Physical Characteristics

The Somali nation is composed of six groupings of clans, the Dir,

Chart 1

Estimated Maize and Sorghum Production 1970 to 1980



Ishaq, Hawiye, Darod, Rohaniwin, and Digil. They inhabit a harsh environment which extends beyond the internationally recognized boundaries of Somalia. The state of Somalia is wholly semi-arid or arid. Rainfall from 500 to 600 mm largely falls in two limited areas. One area extends southwest of the upper Shebelle for distances varying from roughly 150 to 225 Kilometers. The second is a mountainous area in the north 450 kilometers long varying from 20 to 50 kilometers wide. In the remainder of the southern third of the country rainfall varies from 300 to 400 millimeters. In the central third of the country and in most of the northern third rainfall does not exceed 200 millimeters and often is 100 millimeters or less. Most of Somalia has two rainy and two dry seasons. The gu, or long rains, normally extend from April to July and usually provide up to 70 percent of annual rainfall. This is followed by a dry season beginning in July and lasting until October. The der, or short rains, run from October to early December and provide upwards of 30 percent of annual rainfall. In southern coastal regions some rains will fall between the gu and the der seasons. In a very limited part of the northern highlands the pattern is six months of rainy season and six months of dry season. Importantly, rain in Somalia usually does not fall as a general rain covering a widespread area but rather falls from individual clouds moving rapidly over the countryside resulting in what are known as strip rains. 5/ This pattern of rainfall is important in determining the movement of nomadic herds. It also causes wide variability in crop production during any single season over small land areas.

5/ Irving Kaplan, et al, Area Handbook for Somalia, Government Printing Office, 1977, p. 46.

With the exception of mountains running in a narrow strip across northern Somalia from Ethiopia to the sea, Somalia is mostly flat plateaus and plains. South of the mountains, the country descends to a large dry plateau sloping to the south. This plateau "merges imperceptibly into a zone known as the Haud, a broad undulating area that constitutes some of the best grazing lands for the Somali nomad despite the lack of appreciable rainfall for over half of the year". 6/ The southern third of the country, except for a narrow costal area, is a vast plain with a large limestone outcrop, ing located midway between the two rivers which dominate this part of the country. These rivers, the Shebelli and the Juba rise in Ethiopia and traverse Somalia through the Shebelli does not quite reach the Indian Ocean, turing southwest near Mogadishu and paralleling the coast until it disappears into swamp. Both rivers run full twice a year during the gu and der seasons and while the Juba usually flows all year the surface water of the Shebelli often disappears during the long dry seasons. In Somalia both the Juba and Shebelli are bounded by fairly broad, fertile valleys, 4 to 8 kilometers, which permit permanent settlement with relatively easy access to year around water supplies. The presence of Tsetse fly limits the usefulness of the valley for livestock.

It is in this harsh environment that the Somalis developed a way of life that permitted not only survial but enabled them to expand and accumulate wealth mostly in the form of livestock. Nomadism was the way of life that permitted the Somalis to adapt to the environment and it remains the way of life for about 60 percent of the population. Nomadism made it possible for the Somalis, with their herds, to move long distances to take advantage

6/ Ibid. p. 49

of seasonal variations in water and forage availability and to move short distances to gain maximum advantage from strip rainfall within limited areas. In addition the nomads developed a mixed livestock herd which utilized various forms of forage and had varying tolerances for surviving with little water. Cattle eat long grass and can go for two days without watering sheep eat shortgrass and can go for five days without water. Goats eat leaves on bushes near the ground and can go for six days without water. Camels browse trees and high bushes and can go for twenty days without water. All four kinds of livestock can provide the nomads' staple food, milk, but camel milk is preferred. Meat is generally provided by goats and sheep; camel meat is usually only consumed on special occasions and cattle are rarely eaten by the nomad. Camels also serve as beasts of burden and are the prestige animal of the Somali. Finally goats and sheep are most frequently sold followed by cattle and then camels.

The social organization of the Somali nomad centered around the herd is described in the following excerpts from Lewis's Culture, Heritage and Social Institutions.

There are two main types of grazing camp following the division in herding practices associated with sheep and goats (collectively called adi) on the one hand, and camels (geel) on the other. Cattle, whose frequency in watering needs is similar to sheep and goats, if they are owned, (as is the case in the northwest and southern Somalia), may form a third herding unit but one whose movements are frequently closely associated with those of sheep

and goats. A married man moves with his wife and young family with sheep and goats, a few milch camels and burden camels to transport the collapsible nomad's tent (aqal) from place to place. This domestic unit is known as guri (from the verb gur, to move). Related families tend to move and camp together - although they also often split up into new combinations.

Grazing encampments (singular degmo, from the verb deg, to settle) form wherever pasture and water conditions are suitable. Such settlements often consist of 30 or so nuclear or extended families, each camped separately within its own thorn fence pen, and occupying an area of approximately 20 square miles with a population density of some 20 persons per square mile.

Depending on weather conditions, inter-clan relations, government intervention, etc., such temporary encampments may only stay in one place for a few weeks and are likely to be separated by large tracts of unoccupied land.

The grazing camel units (the geel her as they are called) are in charge of unmarried men and boys who, from the age of about seven, are sent out to learn the demanding skills of Somali pastoral nomadism. Girls stay with the domestic unit based on sheep and goats, helping their mothers care for these smaller stock and performing other domestic tasks such as grinding grain into flour

and cooking. Men are primarily associated with camels- traditionally the most prized Somali possession and standard of wealth. Men milk camels, although women are left to cope with the burdensome task of loading and unloading transport camels and with assembling and dismantling the nomadic tent. The camels of closely related kin are herded together and congregate in camel camps in an area of suitable pasture. Each camp in a tightly integrated unit. 7/

About 20 percent of the Somali practice settled or semi-settled crop production. These farmers also maintain livestock if they have sufficient wealth. Most cultivators live in the south along or between the Shebelli and Juba, but there are some cultivators in the northwest corner where rainfall is favorable and in the mountains. Farmers in the northwest are settled nomads who grow sorghum based on a plow culture and keep livestock. These people live in villages around water ponds or wells and for the most part remain partly nomadic. The other northern cultivators live in the mountains west of Hargeisa and produce a variety of crops such as vegetables, citrus and deciduous fruits and wheat. They usually live in villages in the valleys and practice irrigated agriculture.

The major farming area is in the south. Dry land farming which, except for the poorest farmers, is mixed crop and livestock, is undertaken by Digil and Rohaniwin clans known collectively as Saab who have been cultivators for several centuries. These people live in villages based on ponds and practice hoe cultivation. Sorghum

7/ I. M. Lewis, Somali Culture, History and Social Institutions, London School of Economics and Political Science, 1981, p. 22-3.

is the major crop. Most of the families own some livestock, 5 camels, 3 cattle and 4 sheep or goats being the average. 8/ In contrast to the nomads who have an egalitarian society these cultivators have a structured society.

The manner of formation of the Saab clans has led to the development of recognized social inequalities. Members may be physically indistinguishable to outsiders, but insiders know each one's place on the social scale. At the top are the putative descendants of the original clan treatymakers, although they usually cannot prove descent. They are called urad (firstborn) or mindhay (knife bearer). Traditionally they initiate all joint clan activities, such as the rain-making ceremony (roobdoen), and they virtually slaughter animals for sacrifice. Socially somewhat lower are former clients. They were often from small, weak, or newly immigrated lineages that were allocated land for cultivation by the patron group in return for protection. Clients had to give up their former associations and promise to follow the customs of the adopted clan. At first they were not to participate in major decisions, dig a well (sic) on their own, or build a permanent house. Only after they had been assimilated were they allowed to take part in political councils and become members of dia-paying groups. The older the client group, the higher its social rank. 9/

8/ Ibid. p. 30

9/ I. Kaplan, et al, Area Handbook for Somalia. Government Printing Office, 1977, p. 69.

While the Saab farmers permanently cultivate the same land, they remain partially nomadic unless they are one of the few families living near a permanent well or do not own livestock. The ponds on which they depend for water for themselves and their livestock typically do not retain enough water to last through the long dry season. During the period when the water is gone the man, perhaps with one wife and her children, takes the livestock and leaves to find water and grass in the nomadic fashion. The remainder of the family either remains on the farm and hauls water from the nearest source or, particularly in periods of drought, moves into the nearest village or town where there is a well. Finally, it should be noted that true nomads also move through the settled farming areas and a symbiotic relationship has developed between the permanent or semi-permanent farmers and the nomads (see section on agricultural crops below).

The Shebelli and Juba valleys are occupied by two groups of farmers, the Saab and riverine people of non-Somali origin. These people live in permanent villages and grow maize and sesame plus a number of leguminous root and vegetable crops. They often keep some animals, usually cattle; however they do not take up nomadic life during the dry season. Unlike other Somali, the riverine villagers have strong village chiefs who exercise authority in conjunction with a council or committee.

The riverine people of non-Somali origins are known to the Somali as Habasho and

some of them are former slaves who were sold to Somali and adopted the genealogy of their owners. There were others who ran away and settled independently along the river.

"Most of the habasho, however, are descendants of the people who originally lived on the rich, black land along the riverbanks and were often able to defend their land successfully against Somalis and other intruders, helped probably by the prevailing malaria and the abundance of tsetse flies". 10/

They provide most of the unskilled labor for the riverine plantations as well as cultivating their own farms.

About 20 percent of the Somalis live in urban areas. A large portion of them are government employees, other provide various services or engage in commerce or industry. Many urban dwellers maintain close ties with their kin still living as pastoralists or cultivators and are expected to provide assistance to those in need, particularly in time of drought. Often the better off urban residents will own some livestock which are tended by a nomadic relative who is paid a fee in cash or kind.

Another group that deserves brief mention is the 100,000 or so Somalis living abroad to work in the nearby oil producing countries. The movement of Somalis abroad is made up of both unskilled and skilled people, including craftsmen, technicians, professionals and trademen.

10/ I. M. Kaplan, Op. Cit. p. 70.

Given Somalia's lack of trained manpower in Somalia, the absence of these skilled people is a negative factor limiting economic and social development in Somalia. While this is partially offset by the financial resources flowing into the country in the form of remittances or imports, from the development perspective, trained manpower is probably a greater limiting factor than financial resources.

B. POPULATION

The population of Somalia is currently estimated to be 4.2 million based on preliminary estimates from the 1975 census.

The growth rate is estimated to be somewhere between 2.6 and 3 percent. If the 2.6 is correct, Somalia will have a population of 7.1 by the year 2000; if it is 3 percent the population would reach 7.6 million by the year 2000. Neither of these estimates include the refugees now in Somalia. 11/ This rate of population growth poses problems for the Somalia development effort. It is highly unlikely that the nomadic rangeland could support any additional people to those that now earn their livelihood from livestock. In fact, there is probably already an excess of human population as well as animal population seeking to wrest a living from scarce water and forage resources. If this is so, it would mean that the population increase coming from 60 percent of the population, between 1.7 and 2 million people, will have to be absorbed into that part of the economy now occupied by 40 percent of the population. The World Bank analysis shows that under the best of circumstances about 750,000 hectares of rainfall agriculture could be brought under cultivation which would provide farmsteads for 825,000 people. Of this number between 380,000 to 480,000

11/ Somalia Agricultural Sector Review, Vol. I, Main Report, The World Bank, June 29, 1981, p. 9.

of the people taking up land would be the increased population from already settled farmers leaving room for 350,000 to 445,000 nomads to be settled. This leaves approximately 1.2 to 1.6 million people to be supported outside dryland farming or livestock herding. The Bank estimates that, given the limited absorptive capacity of dryland and irrigated farming, a substantial number of the excess nomadic population will need to be settled in non-farm occupations giving a population distribution in 2000 of 2.4 million nomads, 1.42 million rainfed farming, .46 million irrigated farming, .51 to .71 million fisheries and 2.3 to 2.6 million urban employment. ^{12/} The shift in population indicated to be necessary means that employment in rainfed farming will have to be increased by 240 percent, irrigated farming by 216 percent, fisheries by 600 to 835 percent and urban employment by 255 to 289 percent. Based on World Bank data it is estimated that the on-farm investment needed to settle nomads in rainfed agriculture would be between 188 and 243 million dollars. The financial and human capital required to achieve adequate growth over the next two decades will indeed be substantial.

^{12/} Ibid. pp 9-14.

II. LIVESTOCK

Livestock is the mainstay of the Somalia Economy and provides the sole source of livelihood and subsistence for 60% of the Somali people. In addition to the 60% of the population who are nomadic or semi-nomadic pastoralists, another 20% of the population, which makes up the sedentarized or near-sedentarized farm population, are mostly mixed farmers who own or produce livestock in addition to carrying on their crop production activities. Even urban dwellers, from civil servants and government officials to laborers, frequently own or invest in livestock, which are grazed by rural relatives or through arrangements with herders in the more pastoral areas.

In the last major census (1975), livestock in Somalia numbered 5.3 million camels, 3.7 million cattle, 9.4 million sheep and 15.3 million goats. The human population at the time was 3.5 million.

A. Livestock Species 1/

Camels are the most important species of livestock in Somalia. As work animals, they facilitate nomadic movement, but their main function is to produce milk for human subsistence. It is estimated that under normal conditions a lactating camel in Somalia produces about 1000 kg of milk per year and that about 35% of the females are in milk at any one time. Camels calve for the first time at 5-6

1/ Information on the various species of livestock was taken from the IBRD Somalia Agricultural Sector Review, Vol. II of August 29, 1980, pages 6 and 7.

years of age and the calving rate is about 35% for mature females. The long-term average offtake rate for mature camels is estimated at about 3% per year. Offtake (for all species) consists of: (1) live animals for export, (2) local slaughter for export (practically nil for camels), (3) local slaughter for the local market, and (4) local slaughter for subsistence. Young camels are vulnerable to disease, with losses in calves as high as 25% in normal years. Adult camels have losses of no more than 5%.

There are four major types of indigenous cattle in Somalia, Jiddu, Boran, Dowra and Abgal, all of which are zebu type and produced in areas where they perform the best. Liveweight of mature cattle increases from north to south in Somalia, the range being 250 - 285 kg. for females and 300 - 385 kg for males. Annual milk yields per cow are estimated at 140 - 350 kg., calving rates in normal years are about 60%, and calf death losses 15 - 30%; adult losses are 5 - 8%. Heifers calve for the first time at 4-5 years. Average liveweight at slaughter is about 220 kg. and the offtake rate, at 7 - 11% reflects the harshness of the environment.

The indigenous Somali sheep is a fat-tailed hair sheep with black head and white body. It is known for its hardiness, being able to go without water for up to five days. In normal years, herd offtake is estimated at 20%, with a lambing rate of about 90%, with 30% lamb losses and 10% adult losses. Milk yields available for human consumption are about 50-80 liters per ewe per year where camel and cattle milk does not meet family needs. The average weight at slaughter is about 26 kg. Export sheep for Saudi Arabia weight about 30 kg. and are preferred in Arabian markets over Australian imports.

While even hardier than Somali sheep in surviving drought, goats are more susceptible to disease, in particular to Contagious Caprine Pleuro-Pneumonia (CCPP). Offtake rates are, therefore, somewhat lower than for sheep (11-15%), but birth rates are about the same (90%). Milk yields for human consumption are estimated at about 50 - 80 kg. per year.

In 1978 exports of live animals accounted for 83% of Somalia's export earnings, with 96% of the animals going to Saudia Arabia. 2/ The Saudi Arabian market appears to be strong and indications are that it will remain that way. From 80 - 90% of the live animals exported go thru the port of Berbera, where they are loaded on ships and shipped across the Gulf of Aden.

In 1978 exports of live animals amounted to 77 thousand cattle, 739 thousand sheep, 715 thousand goats and 27 thousand camels. The following table, from the IMF report of July 1981, shows the number (in thousands) and value (in millions of Somalia Shillings) of live animals exported from Somalia from 1978-1980. It also shows the percentage of total export earnings from export of animals.

2/ Somalia Agricultural Sector Review, World Bank, Main Report, Vol. 1, 1981, p. 3.

| YEAR | SHEEP | GOATS | CATTLE | CAMELS | TOTAL ANIMALS | TOTAL FOB VALUE (million So. Sh.) | % OF EXPORT EARNINGS |
|------|-------|-------|--------|--------|---------------|--------------------------------------|----------------------|
| 1980 | 739 | 715 | 77 | 27 | 1558 | 570.6 | 83 |
| 1979 | 717 | 705 | 68 | 13 | 1503 | 474.1 | 71 |
| 1980 | 745 | 736 | 143 | 17 | 1641 | 685.4 | 80 |

B. Pastoralism

Nomadic pastoral livestock production is the major subsistence mode for the majority of the Somali population, and the majority of the labor force is engaged in pastoral activities. ^{3/} Most Somali cultivators also keep substantial herds and even town-dwellers usually own at least a few animals. Pastoral production is carried out as a household enterprise, with the senior male member of the household as herd manager. The mix of livestock species that a family has varies according to factors such as disease vectors, the types of pasture available and, increasingly, demand factor in the commercial sector. In general there are significantly higher numbers of sheep and goats in the drier areas of the north of Somalia and greater concentrations of cattle in the higher rainfall areas in the south. The largest family herds tend to be in the intermediate climate zone in the central rangelands.

Grazing management is complex and survival depends on it. It requires knowledge of the rangeland conditions for hundreds of miles at any one time, quick response, and complete mobility to take advantage of grazing and water availability. Somali nomads historically have adapted to their ecosystem very well. There are times, however, during periods of prolonged drought, such as 1974-1975, when traditional watering facilities dry up and human and

^{3/} Somalia Agricultural Sector Review, Vol III, World Bank 1981, pp. 214-215.

animal concentrations become so great near permanent water facilities that the grazing becomes completely depleted and both animals and humans die. It is estimated that about 40% of the livestock on the Somalia rangeland died during the prolonged drought of 1974-75.

Average yearly rainfall is only about 350 mm in the very best of the extensive nomadic grazing areas (it ranges only between 50 mm and about 250 mm in most of the North and Central Rangelands), but it falls in two wet seasons. The fact that there are normally two rainy seasons in the year is important in that the grass and other vegetation does not have to go through more than three or four months at a time without at least some moisture and regrowth. It also permits pastoralists to herd their animals in wet season grazing areas during two parts of the year. This is, then, an advantage to the Somali pastoralist and his livestock.

While up until the first decade of this century the Somali herdsmen were able to continuously expand the area over which they grazed their livestock, current conditions in Africa no longer permit such expansion.

Thus, the major problem facing the nomadic pastoralist in Somalia at present is that human and animal population have increased over pastoral areas in the past few decades to a size greater than the available rangeland can support. The population pressure is causing the quality of grazing lands to deteriorate. Although there have been attempts to reverse this deterioration of the grazing lands and prevent further overgrazing, thru such projects as the

Northern Rangeland Development Project, these projects have not been successful. Similar projects in other countries of Africa which have attempted to increase livestock production and offtake among nomadic pastoralists, while at the same time preserving the extensive rangeland, by developing watering facilities in underutilized areas and introducing grazing management systems, have all been failures. The plain fact is that a satisfactory technology for dealing with the problem of widescale degradation of rangelands under African nomadic pastoral conditions has not yet been developed. While range management has been used in the United States to increase forage production through systems of deferred rotation grazing, attempts to transfer this technology to Africa, including two attempts to do so in Somalia, have been unseccessful. In the U.S. range management has been reasonably successful on government land where the force of law in a highly organized security has been in effect. Yet, even in the U.S. there have been severe conflicts between herders and the government over the use of rangelands.

The historical and traditional means by which nature and the nomads dealt with water and forage problems no longer apply to the situation in which the nomad finds himself. As a result there is overpopulation, overgrazing, and degradation of the range, and it is even less capable of supporting the existing human and animal population. As noted above, attempts to deal with this problem by controlling use of the range have not been successful. The remaining feasibile alternative appears to be reducing the human and animal populations dependent on the range.

It should be understood that Somali pastoralists are not poor and are not averse to selling livestock especially male animals. It should also be understood that they have multiple objectives in raising livestock, and that milk production and survival are much more important to them than producing better meat type animals for marketing. Milk makes up 70-95% of their diet, and they depend entirely on their animals and herd management skills for their livelihood and almost all their needs. It is perfectly rational for a nomadic pastoralist to have 50-75% more livestock than he needs for the normal subsistence requirements of his family. There is one thing that he can be certain of - that sometime there will be another serious drought, and he may lose half if not more of his herd. It is generally accepted that a nomadic pastoralist needs the equivalent of 6 or 7 livestock units (mostly females) per family member. (1 camel = 1.2 L.U., 1 herd of cattle = L.U., 1 sheep = 0.8 L.U., 1 goat = .08 L.U.). It is not at all surprising, because of the constant risks in his fragile environment, to have at least twice that many. It is also a general practice for him to have two or three different species of animals (goats, sheep and camels in the north of Somalia, for example) in order to minimize the risk of losing all of his animals and to take maximum advantage of the various types of vegetation in his surroundings. The three species utilize different types of browse and grass and generally do not compete with each other for the same vegetation. The same is true of cattle. This way, too, the pastoralist can leave small stock (or at least some milking stock) in the care of the women, young children and elderly members of his encampment (or hamlet) while he and the younger male members of his group herd the camels and dry stock further from the encampment.

Another characteristic of nomadic pastoralists that should be pointed out is the independence of the individual family units. Encampments seldom extend beyond the immediate family grouping because greater numbers of people would require greater numbers of livestock, and there would be greater competition for the available range resources. Nomads are exploiters of the grazing land and nomadic families are in competition with each other for the grazing land. If some pastoralists limit the size of their herds, to reduce the pressures on the land, others will soon increase their herds or stay in the area longer to take advantage of the situation. It is, therefore, extremely difficult to get large numbers of pastoralists together to agree on such things as forming grazing associations or practicing and enforcing rotational grazing or deferred grazing systems.

C. Mixed Farming

As stated earlier almost all settled farmers also own at least some livestock. In most cases this ranges from 10-14 animal units. Generally they will keep young stock and milking female animals near their homes or compounds and, depending on the grazing conditions and water availability, the other stock may be grazed a few miles away by some relatives or family members or they may be hundreds of miles away being herded by arrangement with pastoralists who occasionally pass through that farming area.

In the dryland farming zones farmers graze their animals and, for a fee, allow passing nomads to temporarily graze their animals (depending largely on forage and water availability) on sorghum stalks, cowpea stubble, aftermath, weeds etc. This

provides at least some manure to the cropland. Farmers in the Bay Region also gather sorghum stalks after harvest, stack it, and feed it to their stock. They also sell it as fodder to passing nomadic pastoralists who want to stay in the area temporarily while they do some trading or make arrangements for selling animals or other livestock products such as milk, ghee or hides and skins.

Some farmers in both the dryland and irrigated farming areas have become interested in using animal traction to plow and cultivate their fields. In the irrigated areas in Lower Shebelli Region they generally have plowing done by a tractor rental service, but they have found that there can be significant savings from using animal traction for cultivation because of the scarcity and high cost of labor at weeding time. One constraint to the increased use of animal traction and livestock production along the Shebelli River, however, is the apparent heavy incidence of tsetse fly and Animal Trypanosomiasis within a strip extending from 4 to 6 km. on either side of the river. A joint (GSDR/Arab Development Fund/UK) program was recently initiated to develop a tsetse eradicating program for the area. The GSDR has requested that USAID provide the short term services of a tsetse specialist to determine the feasibility of incorporating the sterile male biological control methodology into the overall control program.

In both the small holder irrigation and dryland farming areas additional reserach and extension work needs to be done on integrating crop and animal production in an overall farming systems approach. More water is needed for crops, animals and humans in the drier areas and research should be done on forage and fodder production.

E. Herd Composition and Offtake

In a polot survey of 104 households carried out in 1975 by the Somali Central Statistics Department, sex ratios of the different classes of livestock held by settled and nomadic families in Middle Shebelli Region were as follows: 4/

| | <u>Settled Households</u> | | | <u>Nomadic Households</u> | | |
|---------|---------------------------|----------------|------------------|---------------------------|----------------|------------------|
| | <u>Males</u> | <u>Females</u> | <u>M/F ratio</u> | <u>Males</u> | <u>Females</u> | <u>M/F ratio</u> |
| Camels: | 5 | 20 | 1:4 | 190 | 404 | 1:2.1 |
| Cattle: | 65 | 247 | 1:3.8 | 348 | 1,227 | 1:5.1 |
| Goats: | 98 | 347 | 1:3.5 | 715 | 4,227 | 1:5.9 |
| Sheep: | 19 | 58 | 1:3 | 414 | 2,802 | 1:6.8 |

Although this was a small sample, and the numbers may have been distorted because of the 1974-75 drought, it would appear that the offtake of male animals is quite high. Too much should not be read into this, however because (1) pastoralists will always be willing to market more animals (almost all males) when they are faced with a drought situation, and they will frequently slaughter and consume male calves, lambs and kids during a drough or other streee situation in order to have more available for human consumption. Calves and other young stock compete with the humans for milk, the most important item in the nomad's diet. In general, however, it is recognized that pastoralists are becoming increasingly more commericalized and that they are inclined to sell more male animals as prices increase.

4/ Somalia Agricultural Sector Resource, Vol. III, World Bank, p. 216.

D. Marketing and Export

Livestock marketing is almost entirely in the hands of the private sector. Producers sell animals to small traders or butchers in the field or in small villages. Small traders then sell animals to butchers or, in greater numbers, to larger traders in the larger villages and towns. Animals are usually trecked to market places, but many, especially small stock, are also trucked where roads are good, or where the distance is great. Livestock sales are often conducted through brokers, who receive 2-3% of the value of the sales from either the seller or buyer. Although sale prices are quite high, because of the increased demand for live animals by Saudi Arabia, traders' margins are reported to be narrow (10-15%) and so are butchers' margins (6-14%). Private trade thus appears to offer an efficient service to both producers and consumer.

The export trade suffers from lack of organization of shipping, poor handling and loading facilities, port congestion during busy seasons, poor communications, poor health and sanitation services, inadequate feed and watering facilities at the port and along the major trucking routes, poor institutional credit facilities, poor roads, lack of transport, and the constant threat of epidemic disease outbreaks near the export markets that can hold up the movement of stock for weeks and threaten the entire export trade. 5/ About 90% of the live animal exports go thru the port of Berbera, and the infrastructural facilities (for health control, handling, loading and exporting animals) there and in the zone which funnels into Berbera (the Hargeisa - Burao - Berbera triangle) are in need of improvement.

5/ Somalia Agricultural Sector Review, Main Report, Vol. I
World Book, 1981, p. 58.

F. Current Development Activities of Interest

Efforts to improve the productivity of the livestock sub-sector have included attempts at the introduction of organized range development and management, large-scale dairy farms, ranches, and modern methods of poultry production. ^{6/} Present efforts toward improvement of the range are concentrated in the northern rangelands and are being extended to the central rangelands. Efforts to establish ranches, dairy farms and feedlots are still experimental for suitable technology has not yet been studied. The production of poultry suffers from the irregularity of feed supplies and losses caused by outbreaks of disease, although the Serum and Vaccine Institute can now deal more effectively than in the past with most diseases.

Work with artificial insemination has been going on at Afgoi, where Holstein and Sahiwal bulls are being used. The facility has installed a liquid nitrogen plant, but has not been able to get it operating properly. To date the use of AI has been limited almost entirely to the state farms. Animal health services are important to the success of the livestock sub-sector. Although much has been accomplished in the manufacture of serums and vaccines, the entire system suffers from lack of coordination between programs and projects, poor logistics and distribution system, lack of transport and cold storage, and shortage of sufficiently motivated and trained personnel, especially at the field level.

^{6/} Ibid. p. 23

G. Domestic Marketing and Processing of Animal Products

The Hides and Skins Agency (HASA) has a monopoly on hides and skins exports from Somalia. It operates 6 marketing offices in 6 regions and employs Hides and Skins Improvement Officers in 10 other regions. 7/ The Agency sells both in the internal and export markets, 70% of the exports being in the form of raw materials and 30% in the form of semi-tanned products. There are four government and three private tanneries, two government meat processing factories (KMF and SOPRAL), and a government dairy factory, all of which suffer from limited managerial skills, old age of equipment, frequent breakdowns, lack of spare parts, irregular supplies, and poor marketing organization. The tanning industry also suffers from frequent shortages of necessary chemicals and the dairy plant cannot compete with private milk sales. Milk is in great demand and it is estimated that there are at least 11,000 milk cows very close to or within the Mogadishu city limits itself. Producers sell milk directly to consumers and fodder is brought in daily by truck or donkey cart from within 20-30 km of the city.

7/ Ibid. p. 58

III. Crop Agriculture

It is estimated that about 20% of the 4.5 to 5 million Somali people depend directly on the production of crops for their livelihood. Included in this number are those who farm a mix of livestock and crops. In addition as noted above even urban dwellers, indeed every Somali, will own and keep livestock. Feed and fodder is at a premium near urban areas. It has been observed that cassava is grown near Mogadishu for livestock feed and much fodder is gathered and sold in the cities. Out of the 20% crop producers, it is estimated that about 6% are located near the Shebelle and Juba rivers and grow at least some of their crops (mainly maize and sesame) with river water. This includes those working on the banana, rice and sugar plantations.

The remaining 14% are mainly dry-land farmers growing sorghum under rainfed, high-risk, low input/low output conditions. The large interriverine area between the Shebelle and Juba rivers contains the greatest number of dry-land farmers and also is the area with the greatest potential for expanding agricultural production. Many of the farmers in this area are semi-nomadic (or semi-sedentary) depending on both crops and livestock for their livelihood. Fodder production and collection is extremely important to the mixed crop and livestock farmers. In wet years or on lands flooded by the river (i.e. 1981) farmers will plant maize, sesame, cowpeas, cotton and groundnuts utilizing the residual moisture. Those farmers who have access to continued water supply such as small pumps at the river or a well at an oasis grow a wide variety of vegetables such as tomatoes, sweet potatoes, peppers, onions, and okra. Some fruit production (papaya, banana, mango and some citrus) is found near the rivers and in parts of the northern areas apples and peaches are also grown.

In years with adequate rainfall, crop producers will market to the Government's Agricultural Development Corporation (ADC) and/or sell on the open market, (legally or illegally), 25-30% of their surplus maize and sorghum grain. The potential for drought is so great that farmers store large amounts of grain (up to 5 years supply) and after a drought year will have much less to market because they are restocking their granaries.

The GSDR objectives for crop agriculture include the following:

- 1) Protect the country against effects of drought.
- 2) Gain as rapidly as possible self-sufficiency in production of sorghum, maize and oil seeds.
- 3) Increase production of rice, cotton and sugar to substitute for present imports of these crops.
- 4) Increase and maintain high export of bananas.
- 5) Develop new export crops.

These are worthy objectives and several of the above would seem to be within reach of the country. However, the fact of a rapidly growing population is presently taxing the ability of the crop producing subsector to produce sufficient quantities. These farmers are largely a self-supporting (subsistence) group. Given the social structure and technology levels under which they operate, large surpluses of food crops will be highly unlikely without alteration of the infrastructure and technology practiced.

Government of Somalia policies for the past few years have moved toward rapid expansion of the state-farm concept and the spread of state directed cooperatives, mainly on irrigated lands. The 1979-81 development program states that larger production schemes will be undertaken directly by the GSDR and GSDR promoted cooperatives.

However, the role of the private sector is recognized and the policies encourage private sector farming where the principle of social justice is not sacrificed. It should be noted that recently the GSDR has adjusted her stance on state involvement and has recognized the need of 'contract management' on certain of the state farms. There is even a precedent for disbanding a state farm into small individually operated fields.

The resource base for crop production is restrictive and problematic. Throughout the country, rainfall is low and irregular. Drought occurs frequently and due to the rainfall being spread out over two "seasons" often is not sufficient for producing a crop. Most of the country's usable surface water is from the Shebelle and the Juba rivers both of which have highly irregular flows. Much of the catchment area lies in the highlands outside of Somalia's boundaries. In some areas, there is potential for sufficient ground water. According to available information, based on the incidence of rainfall and soil quality 8.2 million hectares (13% of the total area) are potentially cultivable. Presently, farmers cultivate each year an average of 0.7 million hectares (1 percent of the total area or 8.5 percent of the cultivable land). Much of the "potential" land now lacks the physical and social infrastructure for settlement. There are rainfed areas where lack of

drinking water and roads have prevented cropping from developing spontaneously. However, the natural fertility of much of the potential cropping land is very good with good tilth and neutral to slightly alkaline soils. The soils respond well to minimal amounts of nitrogenous and phosphoric fertilizers.

The expansion of irrigated agriculture is largely dependent on increasing year round availability of water and improving irrigation infrastructure through the potential may be greater if crops selected for irrigation require irrigation only during high water periods. Detailed investigations and overall master plans for both river and river basin resources are necessary to realize potential and to plan adequately for development.

Since there has never been an agricultural census, data on crop areas, yields and production are often based on vague estimates.

The amount of rainfall is the most important factor in determining the major crop base of each subsector in Somali agriculture. In the southern river and interriverine areas, small farmers primarily produce maize as the major grain crop in areas supplemented by river irrigation and sorghum in areas without irrigation. Most small irrigated farm fields are flooded once at the beginning of the cropping season and the crop grown using residual moisture plus rainfall. In northern areas, vegetables and fruit are grown in the numerous small irrigated valleys and sorghum and maize in dry-land farming areas.

With the exception of specialized crops such as sugar and bananas, crop agriculture in Somalia is a low technology, low input operation which produces

low yields per hectare and per labor hour. Yields of sorghum on most dryland farming generally do not exceed 375 to 400 kilos per hectare if the rains are good and on irrigated land maize production much over 500 kilos per hectare is unusual. These yields which are low when measured by any standard reflect the low level of technology employed and the multiple production goals of the farmer. Within these constraints, it appears that the farmer manages the resources at his disposal efficiently. There is no evidence which would support the proposition that either yields or total output could be significantly increased through the more effective utilization of current technology inputs by individual farmers with the possible exception of better irrigation management by operators of small and medium farms. Increases in either yields or in total production are dependent on farmers being able to adopt new technologies and increase input levels. For example, an increase in the number of farmers using animal traction for land preparation and cultivation could lead to increased total production and increased yields per labor hour and adoption of a grain/legume rotation has the potential of increasing yields per hectare and per labor hour by increasing soil fertility and reducing insect damage. In short, for the most part, farmers are operating efficiently on the production functions available to them; meaningful production increases will come only from increasing the land and labor resources devoted to crop production and/or by farmers moving to new production functions.

A. River Valley Farming

The major irrigated areas are of necessity within a few kilometers of the river. Initially, the development of irrigation infrastructure came through

private enterprise, normally with Italian farmers concentrating on banana and sugar. More development has occurred along the Shebelli than along the Juba. Large farms or their remnants still characterize the area, though some cooperatives and settlement schemes are on the Juba. As a consequence of the aging of the system (some built in 1920s) and lack of maintenance since the turnover of some large plantations to small holders, there is an observable deterioration and lack of management which results in an overall inefficient use of water resources. Coupled with this situation is the problem of the intermittent flow of the rivers. The quantity and quality of the river water varies with seasons which constrains farmer cropping patterns.

The typical Somali farming 1-5 ha of irrigated land lives in a large village under the authority of a chief and body of elders. The village authority is the institution which controls the water distribution in the village area.

The fields adjacent to the canal are rigid but not really level. The soils are typically heavy expanding clays with very good water holding capacity and fair fertility. At the beginning of the rainy season after the initial, salty crest of the river is past, the field is flooded. After several days when the field is clear of water, the field is tilled and planted with maize or sesame as major crops. Usually, these crops are irrigated only once and plant growth is dependent on residual moisture from the first irrigation plus rain. Other crops grown are groundnuts, cotton, cowpeas, sweet potatoes and a variety of vegetables. Vegetables and, perhaps, sweet potatoes, will require more than one irrigation. Cowpeas are grown as a rotation crop, but have seldom been intercropped. Most farmers depend on family labor and hoe cultivation. The larger farmers, up to 50 hectares, will use hired labor and some farmers use oxen for plowing and cultivation.

The harvested maize is either stored in underground granaries or sold to ADC or the informal market. Yields vary greatly depending on timeliness of field operations and amount of water available from the river and the rain. One good village farmer in the Jenale area during the 1981 gu season, using 100 kg of urea per hectare plus improved seed, produced a maize yield of 3400 kg/ha while the average farmers in his area grew yields of 500-1000 kg/ha.

The farmers' main problems and constraints are: 1) limited genetic potential of crop varieties used, 2) non-availability of inputs, 3) timeliness and availability of water and general water management, 4) insufficient labor especially for cultivation, and 5) bird and insect pests.

Animal traction had been more widely used in the past on irrigated land, but use has declined due to the increasing availability of tractors and the difficulty of maintaining healthy oxen. Tsetse fly carrying Trypanosomiasis is prevalent in most areas close to the river. When fuel is available for tractors, up to 50% of the fields may be ploughed by tractor, either rented from private farmers or from ONAT. This move toward more dependency on a Government tractor hire agency is probably not desirable since it is reasonable to assume the large numbers of new tractors now operating will be inoperable within several seasons due to lack of maintenance or spare parts. Instead, promotion of animal traction should be encouraged along with increased availability of affordable implements. It must be remembered that the main labor constraint is during time of weed cultivation. It was cited by one of the more progressive farmers in the area that while it cost

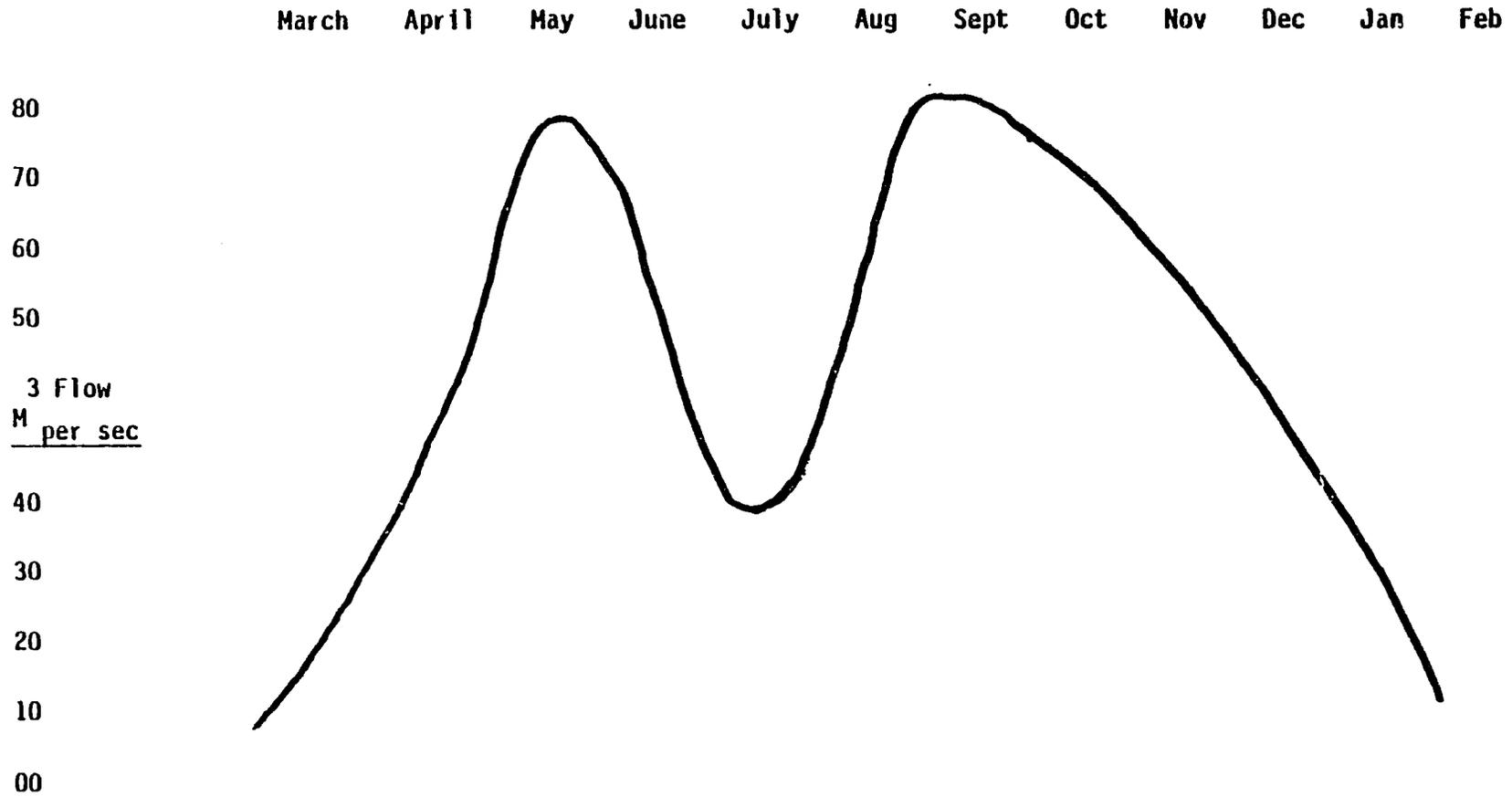
60 Somali Shillings to weed two hectares with oxen pulling a Kenya bought cultivator, he paid out 700 Somali Shillings for labor to hand weed the adjacent two hectares. This type of "demonstration" creates a great impression on neighboring farmers.

Another example showing how Somali farmers are receptive to proven new ways of doing things was their response to a cowpea demonstration by the Extension Service which yielded four times the normal yield. Farmers from neighboring villages were greatly impressed and asked for assistance.

B. Irrigated Potential

Along the Shebelli and to a greater extent along the Juba, the availability of land does not necessarily represent a constraint to increasing production. According to GSDR estimates, over 38,000 out of 85,000 hectares and 14,000 out of 160,000 hectares of available land are cultivated in the Shebelli and Juba valleys respectively. Development of irrigated land on the Juba has been slower than on the Shebelli even though the Juba has the greater potential with water flow cycle varying from 4,000 to 10,000 million cubic meters. The Shebelli provides only a quarter as much flow. A series of dams and barrages are operational on the Shebelli which is essential to moderate the flow and provide some storage. Chart II shows the average flow over a typical year in the lower Shebelli. The peak shown on both rivers coincide with the beginning of the rainy season. The plantations of banana, sugar and rice require year round water and must have supplemental systems for use of ground water during periods of insufficient flow.

Monthly Average Afgoi Bridge Readings 1963



From March 1964 Irrigation Development Report, Afgoi Agriculture Research Station

The Somali Government has realized the importance of development of its river resources. During the period 1974-78, nearly all its agriculture investment was in irrigation. Increases in the hectareage of sugar and rice plantations are being realized with construction of new irrigation systems. With sufficient outside donor assistance major projects like the Bardere dam and small infrastructure on the Juba, could provide a substantial increase in hectareage under irrigation and expanded employment opportunities for the projected increase in population of the area. The proposal to build the Bardere dam has created a good deal of controversy because of its cost, estimated at \$438 million for the dam without necessary infrastructure. The World Bank has indicated that "the Bardere Dam does not look like an attractive investment in relative terms".^{1/} The Bank's position is that maintenance and rehabilitation of existing schemes has a higher priority. Certainly, the Bank is correct in identifying the importance of investing in the improvement of existing irrigation schemes, a number of which are deteriorating from lack of maintenance and inadequate management. However, with respect to the Bardere dam, the matter does not appear to be unequivocal. The Minister of Agriculture and officials at the Juba River Sugar Plantation stated that the Bardere dam is necessary to reduce the risk from both flooding and drought to existing irrigation schemes on the Juba. For example, sugar plantation officials point out that floods in 1981 put 650 hectares of the plantation out of production, 200 to 250 hectares permanently. Additionally, interviews with farmers on the lower reaches of the Juba indicate that during periods of low water during the last two months of the long dry season salt water intrusion extends up the Juba for at least twenty-five to thirty kilometers. The Shebelli water

^{1/} Somalia Agricultural Sector Review, Volume I: Main Report, Report No. 2881a-52, The World Bank, 1981, p. 22.

resources appear over-extended at present, but with increased efficient management and renovation of the existin canal system, additional hectarage could be put under production. For the small holder, it would mean a continued reliance on a one time irrigation to supplement the rainfall. New improved shorter season maize, sesame, groudnuts, cowpeas and other water efficient crops need to be tested and selected under those conditions. In addition, since the valley soils have a very good water holding capacity, crops which will produce without any irrigation (i.e., with residual moisture) must be found.

Plantation crops such as bananas, sugar and rice apparently will remain in the hands of large farmers or public controlled farms. It should be noted that an increase in these plantation crops will adversely affect the small holders by limiting water availability. For example, in 1980, the Shebelli river had such a reduced flow that all the water was used to try and save the bananas further upstream leaving the small holders downstream without water for irrigation. Plans to increase these plantation crops should be developed only on the basis of comprehensive surveys and overall river valley development plans and analysis of the comparative advantage of alternative crops. 2/

The production of bananas and sugar has decreased over the past few years. The Ministry of Agriculture, Planning and Statistics data are given in table I.

2/ Determination of comparative advantage needs to include analysis of frequency and quantity of water required as well as normal criteria.

TABLE I

Somalia production in thousand metric tons:

| | <u>1970</u> | <u>1973</u> | <u>1976</u> | <u>1979</u> |
|------------|-------------|-------------|-------------|-------------|
| Sugar Cane | 450 | 422 | 333 | 261 |
| Bananas | 45 | 168 | 96 | 72 |

While the reasons for this downward trend are many, they certainly include the (a) lack of an effective, production-oriented development program, (b) unprofitability for private banana growers, (c) inefficiency of the Banana Board, (d) management and agronomic problems in government production schemes, and (e) salinity problems. For the private farmer, the most important factor perhaps was the lack of economic incentives.

C. Dry-Land Sorghum Farmers

Dry land cropping is based on the production of drought resistant sorghum and is practiced in many parts of Somalia. Intercropping of cowpeas is widely practiced but typically, the ratio of intercropped cowpeas to sorghum plants is about one to five or ten. Rotation of cowpeas with sorghum is rarely practiced. The interriverine areas between the Juba and Shebelle rivers is by far the largest dry land farming area in the country. In the Bay Region which has the most potential for cropping, about 50% of the people are farmers engaged in permanent or semi-permanent agriculture. There are also pure nomads (about 30-32%), most of whom live in the western drier areas. The farmers depend for both subsistence and cash income on cropping and livestock. A recent sample survey of 27 families, mainly in Baidoa

District, suggests that 48% owned no camels, 15% no cattle, 23% no goats, and 37% no sheep - but that 34% of all those interviewed would, as a matter of high family priority "buy more livestock if they had more money." Since animal traction by both camels and oxen is important to the development of crop production in the dryland regions and since adequate fodder supplies must be available, livestock considerations are closely linked with crop production. As the population of settled farmers increases, the pressure for grazing land will become more acute as it already has in some areas. Adequate provision needs to be made for adequate sources of water and forage supplies for mixed crop and livestock production.

Intensification of the already prevalent practice of fodder collection will be necessary. This will probably require farmers to grow special fodder, browsing and grazing crops, such as Sudan grass, Star grass and Leucaena. Some species such as Leucaena are dual purpose forage and fuelwood species.

The interriverine area is considered a distinct dry lands, rainfed, mixed farming region in contrast to either irrigation or mainly livestock areas around it. Rainfall in the area averages less than 600 mm with large variation in the range of 400-570 mm in good years. The areas further west are driest. It must be remembered that the rainfall is spread over two distinct seasons, the heavier gu (April-July) and the shorter light der rains (October-December). Moreover, variability of rainfall both within and between districts as well as periodic droughts contribute to low crop yields and livestock offtake. Analysis of meteorological data by Van der Poel,

1978, shows that there is a greater probability than 3 out of 10 of a crop failure during the gu season and higher than that in the der season. The extreme variability in rainfall is a major factor in determining what farmers do. The dryland farmer has put together a system of survival techniques which partially protects him from disaster. However, during the dry season as many as 60-70% of the rural population are reported to leave their homes for two or more months, because their local sources of ground water have dried up. Farmers have been known to move to Mogadishu to await the rain. The rain-fed ponds dug and maintained communally by the village or hamlet provide the only source of water for both man and beast to the larger number of farmers. These drain directly from the fields, a fact which adversely affects the farm families health due to contamination and which must be considered when making fertilizer and pesticide recommendations as these chemicals could easily find their way into the water system. There are a few oases where ground water can be reached by hand-dug wells or infrequent boreholes. The ponds are owned by the man or men who organized the original work of excavation and are guarded carefully. Because the ponds do not retain enough water to last through the dry seasons, or noted above farm families often have to leave the farm for one to three months during the dry seasons. This reduces the efficiency of farm operations because labor is not available to do weeding and similar tasks in preparation for the coming planting season or to initiate planting with the onset of the rains. Villages range in size from single families to populations of 1000. Larger villages depend on several ponds and contain Quranic schools, mosques and other local facilities. Each married man normally has cultivating rights in at least one field, the size ranging from 1-3 hectares, with some more

prosperous farms cultivating up to 30 hectares. Women and children play an important role in cultivation-in planting, weeding and harvesting. Cultivation is usually by the common hoe (yambo), but some land is cultivated by ox or camel. There is much potential for the use of draught power for weed cultivation. Minimum tillage together with ox powered cultivation would appear to offer considerable potential for increasing the hectareage cropped by the individual farmer.

Soils in the region vary from the predominate brown Grumosols Clays to more laterite red soils. Most of the soils have a very good natural tilth with a good water holding capacity. Minimum tillage techniques are practiced by many farmers and no pre-planting plowing is necessary if weeds from the previous season had been controlled. Soil erosion is a problem in areas and many farmers engage in conservation practices. A very distinctive hand technique involves building ridges with the aid of a heavy two-man blunt wooden rake called kowawa. One person pushes with the handle while the other pulls on the rope. The loose top soil is shaped into ridges so that the field is a checkerboard divided into neat 2mX2m squares. The sorghum seed is then planted in each square. The purpose is to catch and hold the sparse rain water. Larger squares are often made by hoe or with the camel-drawn rakes. As much of the rain may come in heavy downpours, this holding of the water is very necessary. Adaptive research should be fruitful providing one starts with the local technology. Subjects such as furrowing, plant population, intercropping and row planting should be addressed.

Keeping the weeds down in such large areas (1-3 ha.) is very difficult, but necessary, since the weed competition for water is probably as important as competition for the scarce nutrients. Use of row planting which allows ox-drawn cultivation might help reduce labor constraints.

The local varieties of sorghum have been selected by the farmer for multi-purposes. Each farmer selects early maturing heads of red, pink and white kernels. These types vary in bird resistance, taste and sweetness of stalk. The stalk is high in carbohydrate and is collected in neat stacks to be used for fodder. Much is sold and often has more value than the grain. The farmer thus seeks to assure through the selection of early maturing types that meet certain criteria, that he will have available the seed best suited to his production objectives. Unfortunately, the sample from which he selects is so small that there is little chance of achieving any real qualitative increase in the seed through this selection process. The government has plans to introduce a new Sudanese white sorghum but indications are that more research needs to be done to assure its suitability.

The main insect pests are the stalk borer and sorghum shoot fly. Stalks are frequently riddled by the borer with as many as thirty found in a single stalk. They attack young plants at times, killing the growing shoot, causing the plant to produce suckers. Chemical control for economic production cannot be recommended because of lack of knowledge of these pests, environmental pollution problems, and lack of chemicals. Some control can be realized by rotation, timely planting dates and/or complete removal or destruction of the old stalks a month before the new planting. This whole problem would be a priority for research.

The Quella bird (Quelea quelea) is found in large numbers in dry-land farming areas. Their numbers in a given area are largely determined by availability of Quelea food (mainly grass seed). Variation in seasonal rainfall affects grass production which in turn affects their natural food supply. The number of birds seem to be on the increase and present a very serious problem to the dry-land farmer. Trials at Afgoi showed losses by birds on sorghum up to 40%. Control is difficult but possible research on various "bird resistant" types is in order considering the losses in grain and time spent in frightening birds.

The Somali farmer is surprisingly adaptive and innovative considering the "risk" environment in which he lives. In the past 20 years, crops such as cowpeas, mungbeans, and groundnuts have been accepted and grown by some. Certain farmers appreciate the value of rotating sorghum with legumes. One farmer reported a sorghum gu season yield of 600 kg/ha after cowpeas compared to the usual 300-400 kg/ha. The use of animal manure is not in general practiced, but should be encouraged although quantities available are limited. On-farm trials using manure would be helpful in demonstrating its value to farmers.

After harvest of the sorghum heads, the majority of the crop is stored in underground pit granaries. A hole is dug 2-3 meters deep, dried and partially sterilized through the burning of stalks, pits are then lined with stalks, filled with intact whole heads and then covered with more stalks and sealed with soil. These pit granaries have been known to successfully store grain for up to 10 years without much insect damage. Moisture can be a problem, especially after heavy rain. Losses may go as high as 30% but little is wasted as much is salvaged for chicken feed. Farmers

in the Bay Region often store enough grain for 5 years. Only when he is assured of sufficient harvest will he market the excess, selling to ADC or to local markets. Forage is also sold from their stocks often to passing nomads and to area businessmen.

D. Northern Hargeisa Area Mixed Farming

The city of Hargeisa and the surrounding Galbeed area is the second largest population center in Somalia. It lies about in the center of a 1500-2000 meter high plateau, with about 30 percent of the people in settled agriculture. The type of farming in the area depends on the availability of water to supplement the rainfall which in normal years will grow sorghum and some maize. Maize is often planted twice a year but a long maturing, six month, sorghum only once a year. With supplemental water from hand dug wells or boreholes and the occasional stream, a large variety of fruits and vegetables are produced. A major problem in the area as a whole is lack of dependable water supply. The rainfall pattern differs from the rest of the country with one very long rainy season instead of two shorter ones.

One interesting water conservation technique is the construction of large basins by farmers up to 150 meters square to trap water during the rainy season. The farmer then grows vegetables (mostly peas and potatoes) using the soil moisture which remains after the water has soaked away. One citrus growing area is located about 100 km northwest of Hargeisa near Buroma on the Ethiopian border. This was a development scheme partially supported by USAID in the early 1960's. A Mr. Wixman was given much credit for the

development of this three valley area where water diversion dams and major roads were built. One consequence of that effort is the encroachment of Johnson grass on several hectares of previously good land. This is the result of Sudan grass being introduced as a forage crop, but due to natural selection, the Sudan grass they began with is now pure Johnson grass and is a pest. The chief has lost confidence in new forage crops. The community of El Baardele which has 5,000 members farming 2,000 farms, is governed by Sheik Mohamud Rage and has about 20,000 citrus trees (mostly oranges), 300 coffee trees, vegetables, and grazing on 1,400 hectares. Vegetables are primarily for local use. An export market in Saudi Arabia via Djibouti has been established for their products in addition to Hargeisa and Mogadishu.

The commune uses 40 pair of oxen for cultivation and has large herds of cattle, sheep and goats. Several tractors are owned (from AID project) but are not operable due to lack of spare parts and tools. Nutrient deficiencies, diseases and parasites are problems and new seeds are unavailable. New crops such as sunflower and castor bean are being planned.

E. Northern Erigava Area, Fruits and Vegetables

This area is characterized by a series of valleys, (83 reported) most of which are spring and/or stream fed at about 5-7 thousand feet elevation. Each valley has an estimated 100 small farms of about 1 hectare each under the control of a chief who manages, through his sub-chiefs, the distribution

of water to each farm. These valleys are on the inland side of the east-west mountain range. The farmers in this area are very hard-working, using oxen power and production and management practices (considering the facilities that have been available to them) in advance of small farmers in other areas.

The Midisha Valley (northeast of Erigava) as a typical example, is about 10 km long, 200 meters wide and 40 meters deep. It is enclosed on two sides by sheer rock walls and is home for approximately 700 people farming 110 farms of 1 hectare. They grow vegetables and some fruit such as peaches and apples. Vegetables include tomatoes, cabbage, onions, potatoes. Small cement covered dams cross the river each 1-1/2 km. and a series of cement lined canals transport water from the stream to the fields. The ponds behind the dams are typically 3-4 meters wide and up to 2 meters deep and are reported to fill in 24 hours. The Ministry of Agriculture is considering damming off the river at the lower end of the valley to allow irrigation of the lower Jidali valley. This valley is farmed mainly as dry land sorghum.

On the northern or Red Sea slope of this mountain range, indigenous vegetation includes pine, cedars and juniper. Farms appear productive growing vegetables and some store fruits including citrus. A little coffee has recently been introduced and a few farmers grow some wheat and maize for their own use.

In this entire area, transportation and difficult shipping conditions are likely the most limiting factors. Expansion of production in this area is possible as land is plentiful, if methods of increasing efficiency and supplementation of available water is realized. The variety of fruits and vegetables in this upland area is large, but it has been observed that

better adapted varieties are needed. For example, peach trees were seen having both flowers and fruit indicating problems of chilling requirements. Control methods for insect pests such as scale are needed. Extension services backed by adaptive on-farm research introducing new varieties of fruits and vegetables and pest control measures coupled with necessary inputs such as seeds, are certainly needed to allow these farms to increase production.

IV. THE AGRICULTURAL ECONOMY

Somalia is a poor country and its economy suffers from all of the economic ills common to poor countries. On the basis of results from the 1975 Population and Livestock Census the World Bank has prepared revised estimates of GNP and per capita income.

According to these figures total GNP is estimated at about Sh. 7,500 million in 1978, which would give Somalia a GNP per capita of about \$295 in 1978 at the official exchange rate of 6.3 shillings to the dollar. The shilling, however, is substantially overvalued, and it seems appropriate to use a more realistic exchange rate of 10 shillings to the dollar, which would give a per capita income of about \$185 in 1978. Although this figure is much higher than previous estimates (the World Bank Atlas gives \$130 for 1978), it stills keeps Somalia in the ranks of the very poor countries. 1/

The data for 1978 show that 72 percent of GNP comes from the productive sectors and 28 percent from the service sectors. Livestock is the largest productive sector, producing 50.3 percent of GNP while crops and other agriculture -- produce 7.5 and 4.7 percent, respectively. Only the livestock sector produces more than each of the two service sectors--Government Services at 8.8 percent and Other Services 19.2 percent. In addition, the service sectors have been growing much more rapidly than the productive sectors. Annual growth rates have been estimated by the World Bank as follows: 2/

| <u>Sector</u> | <u>Percent</u> |
|---------------------|----------------|
| Productive Sectors | <u>1.0</u> |
| Agriculture Sector | <u>1.2</u> |
| Livestock | 2.5 |
| Crops | -5.0 |
| Other | 1.0 |
| Industrial Sector | -.5 |
| Services Sector | <u>6.5</u> |
| Government Services | <u>8.5</u> |
| Other Services | 5.5 |
| Total GDP | 2.5 |

1/ Memorandum on the Economy of Somalia, World Bank, March 16, 1981, p.8.

2/ Ibid p.9.

The fact that such a large proportion of the growth in the Somalia economy over the past six years has been accounted for by the services sector is reflective of the serious economic problems faced by the Somalia economy in general and the agriculture sector in particular. Because so little information and data are available on the economics of livestock in Somalia, the sections below will focus on crop production.

A. Crop Production

For crop agriculture it is clear that production of two commodities -- sugar cane and banana -- has declined sharply over the past decade. The data show that from 1972 to 1978 sugar production dropped by 26 percent and banana production by 60 percent. Declines in production are attributed to several reasons, a number of which can be grouped under the category of poor management. Both the area under cultivation and yields have declined. Declining yields are attributed to lack of fertilizer, excessive rains, shortage of manpower, lack of pesticides to control diseases and salinity problems caused by an outmoded irrigation system.

More complete data is available on export bananas and show production declined by 68 percent between 1972 and 1980, a decline from 188.5 MT to 60.4 MT. The major reason for this decline has been the price paid to producers. While some price increases occurred over the years -- a total of 63 percent from 1973 to 1980 -- these price increases failed to keep pace with domestic inflation. Using 1973 as a base, real prices declined over 50 percent by 1980. At the same time the price of inputs increased substantially causing a significant cost/price squeeze on producers. In 1981, taking advantage of the partial devaluation of the Somalia Shilling

the National Banana Board increased producer prices by 148 percent. It is expected that this action, coupled with the Board's contracting with private firms to operate many of the banana farms owned by the Board, will lead to substantial increases in banana production for export.

For other crops the evidence is less clear cut than it is for bananas and sugar. These crops which include maize, sorghum, sesame, groundnuts and cotton are produced with low technology and minimum inputs, some under irrigation but mostly on dry land farms, while sugar and bananas are high high technology, high input irrigated crops. While 1970 to 1978 trend lines for each of these crops would show slightly declining production over the time period, similar trend lines for the period 1971 to 1978 would show that production had trended upwards. What the data do show is that there is tremendous variability in output from year to year. This is true for crops which are grown under dry land farming conditions and for crops such as maize which are grown largely with partial irrigation.

This leads to a consideration of price and price policy for agriculture products. Relating total production of low technology, low input crops such as maize, sorghum, cotton and sesame to prices for the period 1973 to 1980 does not support a hypothesis that production of these crops is very responsive to price change. The evidence is shaky at best but for nominal price changes it appears there may be a tendency to get a highly inelastic positive supply response. It would thus appear that at best one can expect only marginal increases in production from increases in nominal prices if relative prices do not change to any great degree. It is quite possible that with changes in relative price one would see a greater supply response to nominal price changes due to crop substitution.

The data really show no relationship between "real" prices and production of the four crops. While there is some vague suggestion of a tendency towards a backward sloping supply curve the data are really too scattered to draw any conclusions. It is perhaps not surprising that production of these crops shows some slight positive response to nominal price increases but not to "real" prices. It would appear that low technology, low input farmers, who by definition incur little or no monetary costs during the production process, would be relatively unaffected by any cost/price squeeze. However, it would also be reasonable to suppose that, within the limits imposed by their technology and production goals, they would attempt to maximize returns from nominal price increases.

The data might lead some to conclude that "getting the prices right" is unimportant because Somali farmers do not respond positively or respond only weakly to price changes. To do so would be incorrect. What it is correct to conclude is that "getting the prices right" is not a sufficient condition for bringing about significant increases in agricultural production. ^{3/} There are at least three other factors affecting production decisions by low technology, low input farmers that must be accounted for. First, any response to price changes during any growing season may be swamped by the effect of variability in rainfall. If the rains are good, crop production will be good; if the rains are bad crop production will be bad without respect to price. Weather induced variability is always a major factor and there is really no reason to believe that it is in the

^{3/} It also needs to be recognized that price increases are not the only means of providing incentives to farmers. Cost reductions resulting from technological advances may be as or more powerful an incentive because the effect on quantity demanded would be positive rather than negative.

interest of either producers or consumers for prices to fluctuate fully with changes in the weather. Food security, as well as other types of security, may require some system of floor and ceiling prices. Second, the importance of risk avoidance in a drought prone ecology may cause farmer responses to prices to be less elastic than in situations where farmers are less at risk. Third, the level of the farm production technology available to farmers may limit price responses within very narrow boundaries.

It is the third factor which appears most often to receive less attention than it deserves. For price incentives to be effective, other than at the margin, in bringing about production increases, farmers must be capable of making a supply response. Yet Ted Shulze established two decades ago that low technology, low input farmers cannot bring about significant increases in output simply by adding another hoe or planting more poor seed.^{4/} For low technology, low input farmers to obtain meaningful increases they must move to new higher technology, higher input production functions. Given his current technological level it is simply impossible for the one to one and a half hectare farmer who produces most of the dry land or partially irrigated crops in Somalia to achieve significant increases in output in response to price incentives. This does not argue that it is not important for farmers to receive, at a minimum, some sort of domestic parity price for their products. If some attempt is not made to assure that farmers receive adequate prices for their products then there will continue to be transfers of resources from the agricultural areas of the country to urban areas. This will keep farmers incomes low with a consequent decrease

^{4/} Schultz, T.W., "An Efficient Approach to Modernizing Traditional Agriculture", University of Chicago, Office of Agricultural Economics Research, 1963

in opportunities for saving and investment in such critical areas as improved technology and human capital. Additionally, even though the supply response to price increases is only marginal it may be useful. Finally, given the wide variations in crop production attributable to the variability in rainfall, both consumers and producers would benefit from price stability obtained by the use of floor and ceiling prices.

B. Production Costs and Comparative Advantage

Farm input data in Somalia is extremely scarce and of doubtful validity. Nevertheless the World Bank has attempted to do some work on costs of production for comparative analysis of technological choices in agriculture. While the absence of data meant that the Bank had to rely on data from countries with conditions generally similar to Somalia and the results must contain some inaccuracies, it is the best that can be done given the data situation. The following discussion relies heavily on the Bank analysis. ^{5/}

The Bank's analysis focuses on determining the gross margins of various crops at economic and financial prices. This permits an assessment of the value of various crops to the Somalia economy as a whole and their contribution to farm revenues. Two sorts of data are needed to calculate gross margins; farmgate prices were derived from world prices and costs of production are direct production costs other than labor. Because of the importance of labor costs which are not included in production costs gross margins were related to person days required for production. The following data, abstracted from the World Bank analysis shows the comparative advantage of different crops grown in Somalia.

^{5/} Somalia Agricultural Sector Review, Vol. III, Annex 5. The Outline suggests that the Annex be read as a supplement to this presentation.

| Crop | Per ha | Gross Margin to the Economy (Economic Prices) (1977 SoSh) | | Gross Margin to the Farm (Financial prices) (1977 SoSh) | |
|----------------|---------------------------|---|----------------|---|----------------|
| | | Per Person day | Per Person day | Per ha | Per Person day |
| Bananas | 23,000 | 80 | | 7,000 | 65 |
| Sugar Cane | 6,000 | 60 | | 4,000 | 40 |
| Cotton | 7,400/5,000 _{a/} | 70/40 _{a/} | | 4,800/3,300 | 40/25 |
| Rice | 4,000/3,000 _{a/} | 80/60 _{a/} | | 2,000/3,000 | 60/45 |
| Sesame | 4,000 | 100/70 _{a/} | | 2,000 | 50/30 |
| Groundnuts | 3,000/3,500 _{a/} | 45 | | 2,000 | 30 |
| Maize | 2,000/1,000 _{a/} | 40/20 _{a/} | | 1,500/1,000 | 30/15 |
| Sorghum/Pulses | 1,000 | 14 | | 700 | 10 |

a/ Large scale/small scale technology.

Bananas produce by far greatest gross return per hectare both to the economy and to the farmer. Sugar cane and cotton are roughly equal overall though returns to cotton on large farms are almost a quarter larger than returns to sugar cane.

It should be noted that because sugar production in Somalia is completely integrated only comparisons based on return to the economy are valid. It must also be recognized that dry land crops such as sorghum, pulses and rainfed groundnuts, sesame and cotton cannot be directly compared with irrigated crops because the alternative to production of these crops is not an irrigated crop but livestock or some other dry land crop.

The results of this analysis may be somewhat misleading for a number of reasons. Neither crop rotations or interplanting are adequately accounted for so that the profitability of crop farming system cannot be ascertained. Similarly the analysis does not include integrated livestock and crop production. Likewise, multi-cropping of annual crops is not accounted for so that annual returns per hectare costs and capital depreciation weakens the usefulness of the analysis. Certainly gross margins to irrigated crops would be reduced significantly if all capital costs were

accounted for. Finally, in determining comparative advantage among irrigated crops, it is necessary to consider the number and training of irrigations required for alternative crops because of the great variability in water availability over time. Total net returns to the economy may be greater for low value crops requiring only one or two irrigations during high water periods than for high value crops requiring year round irrigations.

The Bank fully recognizes these kinds of weaknesses and attempted to make comparisons between various sizes of farms and various cropping systems. Again rainfed agriculture was not comparable with irrigated agriculture. The results were inconclusive with respect to the relative returns to farm size under controlled irrigation but did show that crop combinations are probably more important in determining gross return to the farm or the economy than farm size or organization of the farm.

Clearly the results are more indicative than conclusive. The Bank suggests that the results need to be weighed with other criteria such as past experience, investment costs, management intensiveness and foreign exchange costs and benefits. The Bank draws the following conclusion from its analysis.

In summary, while some plantation crops such as sugar and bananas appear to be advantageous as large scale operations with clearly integrated marketing and processing services, larger scale Government farms producing seasonal crops have not proven superior to the alternative forms of farm organization, such as smallholder schemes. The latter have the advantage of requiring fewer management and foreign exchange resources. 6/

Another important conclusion that can be drawn from this analysis is the critical necessity for developing the data base required to undertake accurate analysis of production systems in Somalia and to undertake research based on those analyses.

6/ Ibid p. 251

V. HUMAN CAPITAL

Ultimately development in agriculture or any other sector is going to depend on the capability of the human resources available to plan and carry out day-to-day operations and development projects. From the development perspective it is essential that investment in human capital extend all of the way from the rural mother responsible for the initial training and education of the next generation to the highly trained scientist working to extend state of the art frontiers. Somalia, like most countries that have obtained their independence within the last twenty-five years has not made the investment in human capital development necessary for a country to move from the category of the least developed to middle income status. It is probable that the shortage of human capital is a greater detriment to development in Somalia than the shortage of financial capital. It is not difficult to perceive that Somalia is short of scientists, managers, engineers, accountants, analysts, planners, teachers, and administrators. Similarly, as people attempt to cope with the everyday problems of living, shortages at the skill-level - carpenters, mechanics, electricians, clerks and typists - the absence of well developed human capital is apparent. What is more difficult to understand are the illiterate women unable to read and pass on to their children the information that would make them more productive, the farm laborers only able to work half-time because of the ravages of malaria or bilharzia, the infants condemned to go through life with diminished mental faculties because of severe malnutrition, the farmer unable to use the new cultivator with his ox team because he cannot read the directions for assembling it. Yet the lack of human capital at one end of the scale holds back develop-

ment just as much as the lack of human capital development at the other.

Despite all of the problems that Somalia has faced since independence there has been some increase in the stock of human capital. Most notable has been the National Literacy Campaign initiated in 1974. The campaign brought about a reduction of the illiteracy rate from 90% to 50% with a total of 1,170,000 becoming literate. As an integral part of the literacy campaign other efforts were undertaken to build the stock of human capital. There were 1,600,000 people who received health examinations and were treated as needed and 1,400,000 people were vaccinated against diseases. It is estimated that the investment totaled about 60 million Somalia shillings. As a part of the Rural Development Campaign which was related to the literacy drive, a primer was printed for nomads, nearly half of which provided information on hygiene, grazing, cattle breeding and a little arithmetic. Following the National Literacy Campaign a National Literacy Committee was established to continue providing functional literacy education but this has been successful than the first program. The Ministry of Education also conducts adult education classes which appear to graduate around 6,000 students each year.

In the field of education the other massive investment in human capital was the initiation of the drive for universal primary education launched in 1975. Between 1973-75 -- there was no 1974 enrollment of primary students -- enrollment in primary schools increased by 126 perce .. The other major investment in human capital was the smallpox vaccination program which eliminated smallpox in the country. In addition to these campaigns aimed at the

population in general, the government has since independence established a national university including a Faculty of Agriculture, expanded secondary schooling and introduced technical and agricultural secondary education. There are, in addition, 31 specialized institutions under 8 ministries, 12 of which provide education and training in agriculture, livestock production, fisheries, forestry and range management. Additionally many Somalis have been sent abroad to receive higher education.

Yet, with all of this, human capital remains underdeveloped. Admittedly there has been a flight of human capital to the oil fields in the Middle East, but this probably does not total more than 2.5 percent of the population. At every level the human capital needed for agricultural development is scarce. The likelihood of being able effectively to develop, introduce, manage and operate significant improvements in agricultural technology is highly unlikely given the poor human capital base. Clearly increased investment in human capital is urgently required if agricultural developments is to go forward.

VI. AGRICULTURAL INSTITUTIONS

The institutional structure providing support services to agriculture in Somalia is weak indeed. That institutions would still be developing ought to be expected as Somalia received its independence only 21 years ago and virtually no institutional base had been established by the colonial powers. However, institutional development has been somewhat disappointing due in part to the internal and external stress and strain to which Somalia has been somewhat more than normally prone.

A. Parastatals

Like all other African countries south of the Sahara, without respect to their ideological orientation, there has been heavy reliance on parastatal institutions for development and operation of economic activities including agriculture. There appear to be some 23 parastatals servicing the agricultural sector ranging from financial institutions through vertically integrated agricultural units and processing plants to marketing organizations and settlement and employment creating schemes. Except for the financial institutions none of the parastatals is a profitable enterprise and the banks accumulate their surpluses by lending money to other parastatals. The recent Title III study undertaken in Somalia contains the following critique of the parastatals.

The reason for losses are many. Often they are given unclear or unreasonable mandates. One observer asserts they do not do well the tasks assigned and many tasks for which they should be responsible are left untouched. Management of the parastatals is divided between the parent Ministry (where decision making is usually deferred) and the appointed executive of the parastatals. Each party tends to insist on sharing responsibility with the other. The Ministry of Labor plays a major role in employment decision of individual parastatals which share the burden of generating jobs to all school leavers and university graduates.

Other reasons or manifestations of the sector's poor performance include: lack of feasibility studies, excess scale relative prospective raw material supplies or markets for output, high interest burden, high taxes, including levies on depreciation, detrimental

pricing policies and practices. Individual parastatals face cash flow problems and, therefore, must resort to expensive short-term borrowing because of excessive delays in or inadequate compensation by other parastatals, or by government for products and services, or of subsidies to cope with ceiling prices.^{1/}

It needs to be recognized that not all parastatals are meant to be profit making but rather some are service organizations. Secondly, it is clear that the parastatals have objectives other than maximizing output and revenues. For example, one of the objectives set for parastatals was to provide maximum job opportunities for secondary school leavers and college graduates. Often there were also ideological objectives or beneficial social goals. It ought to be kept in mind that for the most part the description of parastatals quoted above would apply to a dozen or more countries in Africa.

The GSDR has taken note of problems affecting parastatal operations and recently initiated some reforms.

First, the levying of the turnover tax, which had been in effect a 50 percent tax on profits to expedite administration, was modified on June 30, 1981 to become a genuine tax on turnovers. This modification will permit the burden on this tax to be largely shifted to consumers, reducing the tax burden of public enterprises while maintaining a source of budgetary revenue. Second, the GSDR is reviewing the position of public enterprises with a view to improving the economic efficiency of their operations. Public enterprises have been classified into two categories -- profit and service. Those in the former category are expected to earn satisfactory economic returns. Those in the latter are not required to operate on a profit basis, but will be required to operate efficiently, with any subsidies for their operations explicitly provided for in the budget. Third, public enterprises that do not provide essential public services and which are determined not to be viable on efficiency grounds will be liquidated. As a first step in this process, three public enterprises -- the Livestock Development Agency, the National Agency for Building Materials and the Agency for Textiles and Household Appliances -- have been phased out and their functions returned to the private sector. Fourth, the Government, in passing through the effects

^{1/}H. Kriesel, et al, Economic Overview of Somalia with Implications for Feasibility of a PL 480 Title III Program, Mimeo, Undated, pp 31-2.

of the exchange rate action undertaken on June 30, 1981, expects that the cost-price distortions from which public enterprises had been suffering, will be largely alleviated. Fifth, high school graduates are being encouraged to pursue vocational or university studies; it is expected that, over the medium term, this will contribute to alleviating the present shortage of technicians and managers.^{2/}

Another problem associated with parastatals is the strong tendency to establish monopoly or monopsony control by the parastatal. The Agriculture Development Cooperation exercised monopsony control over grain procurement from farmers and the Livestock Development Agency was undertaking a project in southern Somalia which would have made it the sole purchaser of livestock in that area. As noted above, the Livestock Development Agency has been abolished, thereby precluding the possibility of their establishing a monopsony position with respect to livestock procurement in the south. Earlier this year the Agricultural Development Corporation's monopsony position with respect to cereals procurement was partially weakened. Farmers were permitted to sell directly to consumers though they are still prohibited from selling to dealers for resale. However, farmers continue to be limited to selling a number of commodities such as pulses, oil seeds, fibers and export bananas to parastatals. If experience shows that the Agricultural Development Corporation can more effectively perform its function with respect to cereals prices without monopsony control of grain procurement, this may lead to a decision by the government to examine the role of parastatals as procurement agencies.

Not unexpectedly, virtually all of the parastatals suffer from serious management problems. The World Bank has identified three closely related problems:

- deficiencies in management systems
- fragmented managerial talent
- lack of managerial talent^{3/}

^{2/}Somalia - Recent Economic Developments, International Monetary Fund, Washington, D.C., 1981, pp 36-7.

^{3/}Memorandum of the Economy of Somalia, World Bank, March 16, 1981, p. 93.

The deficiencies in management systems include accounting practices and procedures and a lack of operating guidelines and plans. Fragmented managerial talent includes such things as divided responsibility for decision making, control of staffing and other personnel matters by outsiders such as the Labor Ministry, use of committees to make decisions on certain matters, particularly discipline, and split decision making with respect to expenditures. The lack of managerial talent is reflective of the scarcity of administrative/technical talent in the economy at large. This is exacerbated by the brain drain to oil producing countries and the low salaries and incentives in the public sector. A reduction in the number of parastatals or a diminution of the number of functions they are to perform might make a substantial contribution to reducing managerial problems. In any event there will be a continuing necessity to accelerate management training.

It should be remembered that government has a legitimate function in providing a variety of services to support agriculture. These services can probably be as effectively performed by parastatals as by the Ministries. It should also be noted that some parastatals have come into being at the instigation of assistance donors who established units outside the line Ministries to implement projects.

B. Financial Institutions

There are no agriculture credit institutions as such in Somalia. Agriculture credit is provided by the Somali Development Bank and the Commercial and Savings Bank of Somalia. In addition, the Agricultural Development Corporation extends credit for seeds and harvesting to farmers from which it buys grain. There is, of course, an informal credit market in which nomadic herdsman are said to play a substantial role as creditors. Interest on loans from banks

are low in terms of the inflation rate, from 5.5 to 7 percent. The Somali Development Bank makes a large number of loans to agriculture, around 80 percent of total loans, but they amount to only 30 percent of the value of loans. A large part of the lending goes to banana growers and little lending is done to operators of small farms. The Commercial and Savings Bank provides about 20 percent of its short-term loans to agriculture. About 40 percent of the loans are made to individual farmers or cooperatives, a little over 15 percent to the Agriculture Development Corporation, a little less than 30 percent to the Farm Machinery and Agricultural Services Organization and the remainder to the National Banana Board. Some loans do go to operators of small farms, but by far the greatest amount of funds is provided to large scale operators, particularly banana growers.

It is difficult to determine whether there is a need for specialized agriculture credit or thrift institutions. In any event it would appear unwise to expand the number of parastatal organizations to include such institutions. The establishment of rural thrift and credit cooperatives operated by the members rather than the government, particularly in nomadic areas, might mobilize significant amounts of capital for investment in productive enterprises and might be worth exploring.

C. Farm Supply and Marketing Institutions

This subject has been briefly discussed in the section on parastatals because, with the exception of livestock marketing and fresh produce, nearly all legal supply and marketing operations are carried out by parastatals.

Provision of farm equipment and materials is largely the responsibility of one organization, Farm Machinery and Agricultural Service Organization (ONAT).

This includes such things as tractor service, seed, fertilizer, insecticides, etc. There are some minor exceptions. For example, the Incas Box Factory provides boxes for banana farmers and ADC supplies farmers from whom they buy grain with ordinary seed.

For the most part, ONAT operates as a wholesaler, making farm supplies and equipment available to other parastatals or to specialized agencies for delivery to the farmer. Performance by ONAT in carrying out their functions has been less than outstanding. In part, this has been due to shortages of foreign exchange, but only in part. Except for banana production, there is no fertilizer available for sale to farmers except some small demonstration amounts brought in under particular projects. Insecticides are virtually unobtainable, though apparently some small amounts can be obtained on the parallel market. Although responsibility for the import, sale and service of tractors was transferred from ONAT to the Trade Agency for Vehicles and Spare Parts in 1978, ONAT is still heavily involved in the tractor business. Somalia was recently the recipient of a substantial number of tractors from Iraq. The total number was supposed to be 2,500, but, to date, the number actually delivered appears to be around 500. These tractors are rented to individuals, cooperatives, projects and state farms. ONAT also rents out such equipment as plows and bush clearers. ONAT continuously operates at a loss as the rental fees charged do not cover operating costs.^{4/} ONAT is also responsible for seed distribution, but because they have never been able to obtain certified seed for distribution, as noted above, non-certified seed is distributed by the Agricultural Development Corporation. Based upon performance to date, it appears unlikely that ONAT will ever be able adequately

^{4/} Somalia Agricultural Sector Review, Vol. III; Annex by World Bank, p. 15.

to carry out the functions assigned to it. Substantial improvement in import supply could probably be obtained by decentralizing farm equipment and supply distribution.

The only supplies delivered to livestock herders are vaccines and other drugs. The Animal Health Unit provides vaccines and other drugs to herders for a fee. Supposedly these drugs are delivered to herders by mobile units operating out of regional headquarters. Actually, most herders must obtain needed drugs from the veterinary service by going to the regional headquarters because of the ineffectiveness of the Animal Health Unit. In addition, there is an illegal but growing drug traffic carried out by private traders to meet a strong demand by the nomads. Because private sale of animal drugs is illegal and the Animal Health Unit is not nearly able to meet the demand for drugs, it is probable that the incidence of disease among livestock is much greater than it would be if the market carried adequate supplies.

There are four parastatals that were responsible for buying agricultural crops and livestock, of which all but one were the sole legal buyer of farm specified products. The one exception was the Livestock Development Agency which has recently been abolished by government decree because of inefficient operations. The three remaining procurement agencies are the National Banana Board, Agricultural Development Corporation and National Trading Corporation. For the most part, National Trading Corporation procures products from abroad, but it does buy sugar from local sugar plantations and a minimum amount of wheat in northern Somalia. The National Banana Board, which is responsible for the entire banana export business from farm production to delivery to ships, markets all bananas sold for export. The National Banana Board has performed none of its functions well. Banana prices have not kept pace with the costs of production

or inflation, and consequently production of bananas for export has been decreasing. Marketing operations have been poorly implemented, with excessively high costs for packing, transport and handling. Recent action to increase the price of bananas should have a beneficial impact on export quantity, but until marketing and production operations are substantially improved, Somalia will continue to fail to realize potential revenue from banana exports.

The Agricultural Development Corporation is the major buyer of grains in Somalia. Until recently it had sole rights to procure sorghum, maize, oil seeds and rice; now farmers have been permitted to sell sorghum and maize directly to consumers but not for resale. The Agricultural Development Corporation is also responsible for procurement and ginning of cotton. The Corporation fixes the price it pays for agricultural crops and the government sets the price at which it can sell. Thus, the margins to pay for such things as transport, handling and storage are fixed. Although ADC has kept its procurement prices low, too low according to a number of analyses, it has consistently operated at a loss largely because it has been unable to cover the increased costs of transport. It appears that by relying on private transporters that the Corporation has generally performed well in servicing farmers except for its price policy. With recent increases in prices, the opening up of part of the market to private trade and bumper crops of sorghum and maize from the 1981 gu season, it appears that the effectiveness of the Corporation will be tested during the coming year.

D. Agricultural Education

The Faculty of Agriculture, begun in 1971 as one of the first schools of the National University of Somalia, provides the highest level of formal agricultural

training in the country. Located near Afgoi, nestled between the Teacher Training College and the Agricultural Secondary School, approximately 140 students (13% female) study a four-year-degree course following a predominantly theoretical syllabus of general agricultural and basic science. The school year is composed of two semesters, each of which is followed by a month of "field work". Each student is placed in a state-run farm or parastatal agricultural-related institution operated by the GSDR to gain practical experience.

Faculty operations are patterned after the Italian education system and the faculty is affiliated with the Faculty of Agriculture at Florence, Italy. A large number of lecturers (16 in 1981) are sent from Florence and teach their classes in the Italian language. This requires the incoming students to spend their first six months in language study. The medium of instruction is a mix of Somali and Italian.

The school is in the midst of a staff development phase. Ten out of the twenty-five Somali lecturers have received graduate training. The others are awaiting scholarships. Overall morale and the standard of education is good although there are significant deficits in the areas of library (books and building), teaching equipment, and staff housing. A particular critical need is the creation and development of a teaching and demonstration farm. Land and potential water resources are available.

The administration realizes the need for additional resources, development of staff quality and the importance of establishing agricultural research as a significant function of the faculty.

The Somali government assigns successful graduates to work on one of the state-controlled agricultural institutions. However, they bring to their first work

experience a very limited and narrow information base of theoretical knowledge with minimal political experience. Incentives to produce and enthusiasm for the job are difficult to maintain.

The Agricultural Secondary School is operated by the Ministry of Agriculture. The three-year course of general agriculture is primarily theory lectures. The school is poorly equipped and is without a farm. Graduates from the secondary school are predominantly fed into the extension service and lower level technical positions of government agricultural institutions.

E. Agricultural Research

Agricultural research was officially established in Somalia in 1958, but research did not actually begin until the mid 60's following the completion of the Central Agricultural Research Station. There are five agricultural research stations doing research on crops, the Central Agricultural Research Station at Afgoi and four sub-stations. A sub-station also located at Afgoi does research on irrigated agriculture and three sub-stations located at Bonka, Gelib-Allesandra and Abuviu do research on dryland farming. In the early years research was assisted by a technical assistance team from the University of Wyoming. The major effort was made at Bonka in an attempt to develop a management package for dryland husbandry. This research focused on such things as variety trials, animal traction, disease control, plant spacing and weeding and fertilizer applications. The Wyoming team also did some limited work on irrigated farming at Afgoi.

The Wyoming team left Somalia by request in early 1970. Following departure of the Wyoming technicians the FAO agreed to provide research assistance and financed a contract team of technicians from MUCIA. This endeavor was beset with problems from the beginning, and by 1976 the MUCIA contract was terminated. FAO has continued to provide some assistance to the Central Agricultural Research

Station at Afgoi, but such research is carried on at an extremely low level.

Raymond E. Meyer has described current research effort as follows:

Current agricultural research efforts are fragmented both administratively and functionally. This results in an inefficient use of the limited resources available to agriculture research as well as unnecessary duplication of administrative support. There does not seem to be any coordination among the various agencies involved or with extension, nor are there well-defined objectives as explicit goals for attainment. While the MOA appears to have some administrative structure for research the facilities at Afgoi are seriously under utilized and minimally supported. The lack of a functioning analytical laboratory prevents the serious conduction of agronomic research. The focus is on individual crops rather than farming systems or solutions of on-farm problems. There does not appear to be a follow through of research to the final agricultural producer; it is, therefore, incomplete. Identifying maize or sorghum varieties with five fold yield increases is meaningless if it is not supported by farmer field trials under farm conditions and carried through a functioning viable seed farm.^{5/}

In any real sense, research which has the potential of providing technological advances that will permit Somali cultivators to move to new production functions simply does not exist. There is a group of Somali researchers who sincerely want to undertake research which will lead to greater productivity and a Minister of Agriculture who is fully aware of the potential benefits to Somalia from research. Unfortunately, there is neither the technical competence nor the necessary administrative and logistical support required for a meaningful research program. While research for agricultural cropping is in a sad state of repair, livestock research simply does not exist.

F. Agricultural Extension

Extension services provided by the Ministries of Agriculture and Livestock are functioning at an extremely low level. During the period roughly from 1968-1978 extension service was not accorded a high priority and it is reported that by

^{5/} R. E. Meyer, Somalia National Agricultural Research Strategy Terms of Reference, USAID/Somalia, Mogadishu, 1981, Mimeo, p 4.

1978 headquarters of the agricultural extension service had been reduced to three or four persons. The extension service of the Ministry of Agriculture is being rebuilt with donor assistance, but it faces major structural and operating problems. The major problems are lack of adequately trained staff, little or nothing in the way of research results which would provide improved technology for better farming systems and the lack of an adequate method for extending information to farmers. There is little reason to believe that an extension method based on developed country models such as that existing in the United States would be effective. At least three critical elements which contribute to the success of U.S. extension are absent from Somalia. These are the close ties to research and institutional support provided through the land grant colleges, the predominance of large farms which permit the extension agent to influence production on large areas by contacting a relatively few farmers, and the absence of well-developed and active private farm supply and procurement systems which supplement and support the extension services.

Building effective means for providing farmers with information about new and improved technologies and methods is clearly an urgent matter in Somalia. There is also evidence based on work that has been done to date on revitalizing the agriculture extension service that Somalia farmers are receptive to improved practices proposed by an extension service if they are convinced that it will increase their productions and not increase their vulnerability to drought.

VII. AGRICULTURAL ASSISTANCE STRATEGY

A. Introduction

It is the fundamental position of this paper that agricultural development activities will be successful only if they deal with actual problems faced by Somali agriculturalists. There are three critical characteristics of agriculture in Somalia which must be recognized, understood and acted on in order for an assistance strategy to be acceptable at the farmer or herder level. The strategy set forth here is composed of five elements related to each other by the common objective of expanding agricultural production and increasing the number of families engaged in the production of crops. The strategy proposed, even if successfully implemented, will not result in dramatic short-term increases in agricultural production and revenue. It is the conviction of the team preparing this report that no such opportunities presently exist nor are they likely to emerge during much of the 1980s. The strategy proposed is one which is intended to initiate a process that will make it possible for the Somalis to achieve reasonable progress in increasing crop production and herd off-take. We would define reasonable progress in crop production as that which might achieve a compounded rate of increase averaging 4 percent per annum over the next two decades.

There are two additional points which need to be stressed. First, the strategy proposed is meant to be a rolling strategy, one that moves toward greater involvement in such activities as production, marketing, expansion of crop hectarage, reduction of herd size and

conservation of national resources. Second, this is a strategy for USAID/Somalia assistance to Somalia in agricultural development, it is not a strategy for agricultural development in Somalia. The strategy identifies in priority order certain areas of assistance which are considered to be of essential importance to agricultural development in Somalia and are fields of endeavor in which the U.S. can be expected to function with a high order of effectiveness. A strategy for development of agriculture in Somalia would differ significantly, particularly with respect to the number and variety of activities identified.

B. Three Critical Characteristics of Somalia Agriculture

1. The single most important characteristic of Somalia agriculture is that it must function in a drought prone ecology. This means that Somalia farmers, herders and the urban population are continually at risk, though the risk to the urban population is much less immediate. Food security is and will continue to be the first economic and social priority and risk avoidance will dominate decisions made by farmers and herders on production and marketing. The ever present specter of drought and the unpredictability of rainfall means that agricultural development must take place in a fragile environment in which there is always a substantial risk that changes brought about through development activities may bring about unacceptable degradation of the environment.

2. The second characteristic to be considered is that the large majority of the Somali population are livestock producers and are by necessity nomadic. The nomadic way of life is an uniquely

efficient way of using a large part of the ecology and environment of Somalia to sustain and enhance human life. Because of the great variability from year to year, season to season, area to area of water availability, the nomadic movement of animals and people is the only known technology other than stabilized ranching 1/ for maintaining domestic animal production. The problems which have developed with respect to nomadic herding result from increases in the size and number of herds and the limitation on land available. This is exacerbated by development of permanent water resources which are not and cannot be supported by adequate forage. This has resulted in degradation of the environment which in turn increases problems associated with human and animal overpopulation. Because there is no technology for utilizing dry land grazing which is superior to that already employed by the nomads, development efforts in nomadic livestock production must focus on assuring that human and animal populations are kept at levels which make it possible to maximize and maintain incomes to herders over time.

3. The third critical characteristic to consider is that crop producers have developed and are operating in an efficient production management system given the level of technology.

With perhaps one exception, operators of small farms in Somalia produce at a high order of effectiveness within their current technological, environmental and human resource constraints. The

1/ This is not the same thing as saying the farmers are producing at levels which give acceptable yields. They are not. It does not say that given the low technology, low impact agriculture practices and farmer objectives, resources are effectively utilized.

exception is water management associated with irrigated small farms. Characteristically, the dry land farmer is operating under a high risk environment using low technology and low inputs for production of mixed crops, either with respect to time or space, or mixed crops and livestock. The farming system employed or organized strives to maximize food security rather than to maximize output. The farmer spreads his risk by raising both livestock and crops. Water availability for his crops, livestock and himself is precarious and he cannot afford to invest his resources and energy in new technology that may increase his risk.

C. Component of the Strategy

1. Development of an Adequate Knowledge base and Improved Technological and Farm or Herd Management Practices. Implementation of the first priority strategic component requires the initiation of a major effort to establish in Somalia an effectively functioning research capability. This research component is composed of two parts. First, because there is little in the way of detailed information which has been accumulated and set down in an organized form about farming, herding operations, technology, production objectives and the environment in which these activities take place, studies are necessary to accumulate this critical information, Second, research based on findings of the studies discussed above must be undertaken to improve technology and management consistent with farmer and herder production objectives. Both research components can and should be carried out in concert and roughly within the same time frame. This is the essence of Farming Systems Research which is structured to carry out farm level research through a farmer/researcher partnership in problem identification and farm level testing of improved technologies and management

practices. Research undertaken should be comprehensive farming systems research directed at individual crops.

2. Increased Investment in Human Capital Development. Development ultimately depends on the quality of human resources available to carry it out. In Somalia there has been inadequate investment in the development of human capital in terms of development requirements. This is true for the entire society and includes senior scientific and management personnel, professional, technical, clerical and semi-skilled workers plus the farmers and herders who make up the great bulk of the productive population in Somalia. The investment in human capital strategy component should encompass three aspects. First, training and education should be provided to enhance the capability of Somalis in fields of critical importance to agriculture including scientific research, management and administration, middle level operational activities, maintenance and teaching. Second, as knowledge about improved technology and management is produced, farmers and herders should be instructed in use of the new techniques. Third, investment in human capital should include increasing the capability of farmers and their families through improvements in their physical and mental well being. This can be done in a number of ways by increasing the quantity and quality of education and improving environmental health and nutrition. It can include such things as development of better water supplies and improved sanitation, school feeding programs and dietary supplements, integration of agriculture into the primary school curriculum in rural areas, etc. PL 480 resources are often well suited for these kinds of activities and it is recommended that opportunities for using PL 480 resources in this way be explored. Indeed, it is

questionable whether PL 480 assistance to Somalia ought to continue if it is not directed towards investment in human capital development.

3. Decrease Human and Animal Pressure on Nomadic Grazing Areas.

Because of the critical importance of livestock production and marketing to Somalia and because there is no known technology for increasing the efficiency of nomadic herding applicable in Somalia or expanding the amount of rangeland forage available, control of the size of the herd and expansion of livestock and livestock production marketing is essential. In addition to livestock research, it appears that there are two possibilities for decreasing pressure on the range - they are settlement and increasing herd-offtake. Settlement will be dealt with in the fourth strategy component below. Given the current state of knowledge, the most likely approach to increasing herd off-take in the near term is increasing the effectiveness of marketing operations. These operations are for the most part in private hands and they should remain so. The objective should be to take advantage of the fact "that the nomads have been for centuries part of a vast, monetized, trading network connecting Ethiopia and the Arabian Peninsula. Commercial attitudes are consequently strongly developed". ^{2/} One possibility would be to facilitate marketing by providing adequate health facilities, improving stock routes, upgrading water and forage supply systems, facilitating credit, etc. Two examples of the sorts of thing that might work are set forth below.

^{2/} Lewis, I. M. Somalia Culture, History and Social Institutions, The London School of Economics and Political Science, 1981, p. 25.

Improved credit facilities would facilitate marketing arrangement between producers and traders and also between traders and buyers, allow producers to be paid for their animals immediately upon delivery and would permit additional traders to enter the market. It might also encourage producers to establish their own trade organizations so that they can handle more of the marketing functions themselves or thru their own agents. Credit could also be made available to farmers in or near the area of the export triangle so that they could develop small-scale irrigation systems to produce fodder for the animals or establish alternative holding areas. Another possibility is to expand the export triangle to 50 km south of Hargeisa and 70 km south of Burao. After animals are vaccinated (comply with export requirements) they have to be held for 14 days before going into quarantine (2 days only before shipping) near Berbera. There is reported to be plenty of good grazing land south of the present triangle. If this area were provided with some basic infrastructure such as tracks, watering facilities, and also transport and health services, animals could be held there after vaccination rather than in the overcrowded and overgrazed small triangle. This would reduce the problems of disease outbreaks and overgrazing within the present smaller triangle and allow the animals to continue growing and be in better condition at the time of shipping. It would also reduce the need for transporting so much hay and fodder into the triangle.

Over the longer term possibilities for decreasing herd size include such things as increasing the birthing rate of all kinds of livestock, increasing milk productivity or alternately bringing about

changes in the nomadic diet by in part, substituting grain consumption for milk consumption. All of these could reduce the size of the herd necessary for providing the nomads subsistence. There are really two essentials. First, whatever is done should be focused on improving the existing system not changing it. Second, no increased burden should be placed on existing government institutions nor should new government institutions be developed.

4. Near Term Assistance to Small Farm Operations. Because the knowledge base for ways to improve crop production is so limited, the strategy recommended is to focus on infrastructure improvements that will facilitate increased productivity of small farms and expand the number of small farms. It would appear that the most appropriate means for doing this would be (a) to increase permanent water supplies available to semi-permanent dry land farmers in the interriverine area, (b) to provide new water supplies in the interriverine dry land farming areas not now being cultivated, and (c) to improve water management for small farms in the river valleys. The purpose of this strategic component would be (a) to permit semi-permanent dry land farmers to become permanent settlers so they would have more time to devote to farm activities, particularly at the beginning of the rainy season and be in a position to take advantage of new technologies as they are developed, (b) to provide water supplies that would make possible opening up new land for dry land farms in the interriverine area and provide an opportunity for the semi-permanent or permanent settlement of nomads, and (c) in irrigated areas, to conserve water, prevent water logging, spread water over larger areas, put the farmer in a position where he will be able to maximize returns and food security from

new technological development and increase the amount of land being irrigated.

5. Strengthen the Institutional Support Systems for Agriculture. Research has been dealt with elsewhere. This strategic component could include improving the performance of government institutions that deliver agricultural supplies and equipment to farmers and herders, provide credit, or purchase agricultural products. Consideration should also be given to developing non-governmental institutions or systems to handle some of these functions and thereby reduce the burden on already overtaxed government institutions and personnel. In addition, educational institutions such as the Faculty of Agriculture and the Agriculture Secondary School must be strengthened in order to increase the quantity and quality of agricultural support personnel. Finally, but by no means last, institutions responsible for providing information to farmers need to be strengthened and broadened. Carrying out the institution strengthening component of the strategy with qualitative and quantitative increases in knowledge, information, financial resources, farm inputs, and market outlets could facilitate the development of private small and medium scale agricultural enterprises as the major productive segment of Somalia agriculture.

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DRAFT PRELIMINARY

Somalia Agricultural Sector Strategy Outline

I. Framework

A. Purposes of AID's Agricultural Sector Strategy

1. Major Purpose - Increase near term (3-5 year) production and incomes in Ag. Sector.
2. Secondary Purpose - Begin the development of key institutions necessary to sustain and continue production increases.

B. Potential and Constraints in the Agricultural Sector

1. Livestock

- a. There is an upper limit to the carrying capacity of the low-input livestock economy which is likely to be reached over the next decade.
- b. Offtake from this sector depends primarily on market conditions.
- c. Increases in offtake are likely to occur if there are price increases or improved market opportunities
- d. Price increases depend on external markets and export policy (particularly export taxes and the 35% drawback requirement.
- e. Before anyone can determine what interventions are useful for increasing the domestic value added of livestock (i.e. through fattening or other processing), a thorough study of potential markets must be conducted looking into prospects for live animals, chilled meat, canned meat, and hides and skins.

2. Non-Traditional Exports

- a. At present, other exports are very limited.
- b. We cannot push development of non-traditional exports, before there has been extensive study of potential markets.
- c. In any case, non traditional exports are probably the domain of private, multinationals with existing marketing networks.

3. Irrigated Maize

- a. Irrigated maize acreage was expanded in response to liberalized markets.
- b. There is substantial potential for yield increases through adaptive research of existing low-input technologies.
- c. Input delivery systems will be a constraint to further production increases, and a way must be found to circumvent fertilizer factory.
- d. The Extension Service needs to be expanded beyond its current limited outreach.
- e. There are major gains (or avoidance of major losses) available through rationalizing the irrigation system on the Shebelle:
 - (1) Drainage
 - (2) Water Allocation
 - (3) Water Management
 - (4) Planned further irrigation Development
 - (5) Transport Infrastructure

4. Dryland Sorghum

- (a) Sorghum is the major traditional smallholder crop.
- (b) There are potential short-term production gains available from adaptive research of existing low-input technologies

5. Cross-cutting Sectoral Issues

(a) Policy

- (1) Market liberalization has already paid major dividends, but concessional food aid will be a hindrance to major increases in demand for grains, dairy, and edible oils.
- (2) Parastatal organizations continue to be a serious hindrance (e.g. fertilizer, proposed milk reconstituting plant, state farms, etc.)
- (3) Civil service salaries and size preclude any serious approach to institutionalizing any public sector activity.

(b) Research

- (1) There is a need to slowly strengthen the development of a Somalia indigenous agricultural adaptive research capacity.

(c) Extension: expect major responsibility to lie with IBRD

(d) Input Delivery - A major problem

- (1) Parastatal
- (2) Fertilizer currently costs twice as much to produce as it costs to import.

(e) Marketing - O.K.

(f) Credit - no felt need

(g) Transport Infrastructure: have no information on current needs.

(h) Agricultural Planning and Policy - Limited institutional capacity with many donors already involved.

4.

(i) Training

- (1) No sense now of sectoral demands
- (2) Existing capacity to produce Ag. (B.Sc.)
- (3) Need to develop mechanism to produce agricultural technicians, particularly in irrigation management.

(j) Irrigation - important need now to develop software for irrigation on Shebelli with spinoffs for irrigation on Juba.

- (1) Land use planning
- (2) Land Tenure
- (3) Water and Land Charges
- (4) Water Allocation
- (5) Water Management
- (6) Legal Framework

(C) Proposed Approach

1. Interventions with short term payoffs (5) years.

- (a) Livestock Marketing
- (b) Adaptive research in maize and sorghum

2. Interventions with medium term payoffs (5-10 years)

- (a) Irrigation software in Shebelli
- (b) Infrastructure development in Shebelli
- (c) Non-traditional export development
- (d) Livestock Market Development

✓ RC

maize

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5.

3. Interventions with Long Term Payoff

- (a) Development of adaptive agricultural research capacity.

4. Agricultural Development in Somalia will not take place without the following policy changes:

- (a) Privatization
- (b) Civil Service Reform
- (c) Reduction of concessional grain imports

Substantial progress on all of these fronts must occur within five years.

It is critical that USAID use its PL480 and ECF resources to work toward this end.

DRAFT
D.Aronson:drv
August 6, 1979

SOMALIA

AGRICULTURE SECTOR REVIEW

THE SOCIAL IMPACT OF AGRICULTURAL DEVELOPMENT

Introduction

1. The objective of this annex is to review and analyze the impact that recent development policy has had upon Somali society. Since 1970 at least, when the Second Charter of the Revolution articulated the goal of social justice through the philosophy of scientific socialism, the Somali Democratic Republic has been clearly committed to a social policy of development with equity. Since over eighty per cent of the population is directly engaged in agricultural production, an analysis of the social impact of agricultural development can measure the degree to which overall Somali social policy is being achieved in practice. The first part of this annex reviews the country's social and cultural resources, the basic elements with which the development strategy must work. The second part examines the role of the state and its institutions in transforming Somali society, and describes the consequences of political and social forces on rural producers. The final section focusses on problems in and prospects for the achievement of social objectives, and contains our recommendations for government action to resolve some of the dilemmas posed by the gaps between the theory and the practice of societal development in Somali conditions. This annex makes no judgement on the validity of Somalia's social goals, but only reviews how far government is now actually going to realize the goals it has set for itself.

I. The Social and Cultural Resources

2. The concept of "human resources" as generally used is far too narrow to encompass the human factors that are important to understand in the development process. Society is much more than the sum of its individual members' energies, skills, and potentials that can be harnessed for new endeavors. Rather, it is a complex structure of groups, activities, interests, and relationships. This structure must be understood just as well as other structures like soil or hydrogeological formations before it can be determined how it can best be mobilized for new undertakings. Existing patterns in the distribution of social groupings, in the strategies by which groups attempt to achieve their own goals, or in the relationships they have with one another can be obstacles to particular types of change or they can be the building blocks for new ideas and structures. An adequate description of the social and cultural "landscape" is thus a necessary first step in assessing social policy.

Population

3. The national census of 1975 is currently being processed. The provisional figures which have so far been released permit a general overview of population distribution, but do not yet allow detailed statements of age and sex ratios, the total labor force, size-classes of settlements, or the like. It is expected that the full analysis will be available for the purposes of the next full round of development planning now getting under way.

4. The current revised figure for the total 1975 population

is 3,722,000.^{1/} Accepting this figure, and further assuming a net annual growth rate of 2.5% (estimates vary from 2.3 to 2.7%), the population by mid-1979 would have been 4,111,622. Of the 1975 totals, 59% were classified as "nomads", 22% as "settled farmers", and 19% as the "non-agricultural" population.

(a) By region

5. Somalia is now divided into sixteen administrative regions, as indicated on Map 1. For general planning purposes these regions are sometimes grouped into six macro-regions which correspond to broad differences of geography. The total population, area, and population densities for each region are shown in Table 1.

6. In general the lower rainfall areas of the northeast and central rangelands carry the lowest populations and densities. Two areas bear the highest densities: the first is the two major river valleys of the south and the better-watered Bay Region between the rivers; the second is the northwest, the primary area of intense commercialization of livestock. In rough terms of economic geography, the country can be characterized as two zones of relative concentration of activity connected by a large area of sparse utilization. It is to be expected that one effect of the recent paving of the highway linking the zones will be to intensify economic activity in the intervening zone.

^{1/} This total is 230,000 more than the provisional figures which appear in earlier government and IERD documents. Since those figures were released, Lower Juba reion has been divided into Lower Juba and Middle Juba Regions, and the total for the two as now given is 193,000 more than the total for the former single region. The new figures also give Middle Shebelli region 37,000 more people than before. In any case, the census was carried out in the disturbed conditions of the longest drought in modern history, and may have overcounted.

(b) By settlement pattern

7. Table 2 shows the population of the country by settlement type, according to the three categories used by the 1975 census. Each of these categories requires some explanation.

8. The "non-agricultural" population of the census was defined as the population of the regional and district capitals. The category is thus not strictly the urban population, since some towns are not capitals. As well, non-agricultural workers in areas outside the capitals are not included in the category, while farmers and herders who happen to live in the capitals are .

9. The "settled farming" population is those people in permanent villages. The category thus includes the crop farmers (except as above), but it also includes many people who may live in permanent settlements but who derive the principal part of their income from pastoral activities. In Somalia there is a continuous gradation from non-livestock-owning farmers or plantation workers to sedentary but full-time pastoralists. This category thus includes a large but unspecified number of people who are classified in some documents on Somalia as "semi-nomads."

10. The "nomadic" population includes all those enumerated outside permanent settlements. It is evident from the table that the nomads are not restricted to the rangelands of the central and northeastern super-regions, but are also quite high proportions of the regions where crop farming is practiced. In only three regions, Beadir (Mogadishu itself), Lower Shebelli and Bay (where substantial numbers of people have sedentarized), do nomads constitute less than 60% of the total population. Nomads are the constant features of the Somali social landscape, settled people (62% of whom live in four of the sixteen regions) the special case.

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11. The large proportion of nomads (59% overall) poses special problems for Somalia (as for its sister "pastoral republics," Mongolia and Mauritania). Census-taking, planning, providing social services and general administration are all complicated by the mobility of the population. The government has embarked upon a general policy of settling nomads, but realizes that sedentarization can only take place as sufficient resources, which nomads now have to move to exploit, eventually become available at permanent sites. In fact the frequency with which pastoral Somali change residence, and the regularity of their migration routes, vary by area and over time. Some are nearly sedentary but live in dispersed homesteads, while others move frequently and opportunistically over a large territory. Most spend at least four months of the long dry season (jilaal) at or near a permanent water point. Even when they move, they range within broad areas associated with their descent groups. Nomadic "anarchy" is an exaggeration; planning can proceed once detailed knowledge of environmental constraints to move is assembled.

Factors of Unity

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12. The resources that Somalia can rely on for the development effort include the relative unity that exists in religion, language, culture and historical outlook. The Somali people have always been a nation in that sense, though only recently have most of them been in a single state. This consensus manifests itself concretely: civil servants, for example, can be posted anywhere in the country without feeling alien in language or culture, and can therefore begin working immediately; written communication is clear and well-understood by all; the vision of all Somalis as underdogs in the partition of their historic lands by more powerful foreigners underpins a loyalty to the nation which has endured over time and has been mobilized by successive national leaders from earliest days. The



uniformity in even relatively esoteric subjects like the folk systems of astronomy, measurement, and edaphology, can enable extension workers, researchers, or curriculum designers to make quick progress with their clients unencumbered by conflicting ideas or foreign concepts.

Traditional Socio-Political Structure

13. The creation and expansion of colonial administrations in the first half of this century wrought profound changes in the organization of Somali society. The independent state of Somalia has further altered the basic social and production processes, and will be examined in Part II below. But the traditional structure that is being transformed still exists, however weakened by the growth of the modern state. That structure represented a relatively successful adaptation to environmental and social constraints at a low level of technological complexity. It enabled Somalis to occupy a vast and often inhospitable land, and it provided basic subsistence, social, and physical security. Importantly, it still provides to many Somalis their most significant relationships to other people and to the resources necessary for their daily life. It is this structure that the state seeks to develop, change, or replace.

14. The fundamental idiom in which the traditional world was understood was that of kinship. Membership in one of the six broad patrilineal descent groups (technically, clan-families) gave each Somali an ultimate claim to a place in the social order. Belonging meant sharing the overall rule of customary law and having a stake in the particular resources of land, water and power that each clan-family defended as the patrimony established by the clan's founder. Four of these clan-families were largely pastoral by occupation-- the Darod, Dir, Isaq, and Hawiye--while

two were primarily agricultural-- the Digil and Rahanwin. Outside this structure in what is now the Somali Democratic Republic lay only the Arabized communities of the coastal trading towns, some Galla-speaking pastoralists and farmers, and Bantu-speaking cultivation groups who pushed up from the south into the riverine areas and were largely incorporated into the agricultural clans of the Somali.

15. The name of one clan-family provided the individual with a basic "address" (as I.M. Lewis points out), a location in the social structure. Each lower-order segment of one's genealogy identified one more specifically, and the relations between segments at greater or lesser genealogical distance provided guidelines to each person on how to behave toward others. This identification was important in part because small groups were frequently physically interspersed with others from many different clans. For while each of the large clans and clan-families was identified with from one to three or four large blocks of territory, the exigencies of the environment meant that individual groupings might range widely into areas beyond the zone ordinarily most securely occupied by themselves and their close kin.

16. Among the pastoralists it was the "dia-paying group", however, that was the most effective mobilizer of ongoing loyalties and obligations. Formed from among close kinsmen (but not necessarily including all of them), this group entered a collective formal contract (or treaty, heer, in Somali) to pay and collect compensation for injury and death. By sharing political risk and ranging physical force when necessary, the dia-paying group provided its members basic social and physical security. The group acted only when necessary, however, and from day to day there was no centralized political authority over the actions of individual herding units. The

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moral force and influence of Islamic religious leaders helped to bind the otherwise centrifugal social forces, while wealth, intelligence and tact could earn a man considerable influence within his lineage.

17. Among the cultivators of the south the control of access to the limited resources of land and water enabled clan and lineage leaders to wield more power than among the pastoralists where these resources were more widely dispersed. Chiefly hierarchies were therefore more concretely established, and the statuses of stranger, client (which status was formally abolished in 1960), and full clansman were more rigorously distinguished. Nonetheless, cultivating villages regularly comprised people of several different lineages, and village leadership was in the hands of the elders of the constituent clan segments. Villages as such were not aggregated into wider political units, but a solidarity grew across lineage segments within the village through water point construction, village maintenance, and agricultural task sharing.

18. Access to other major factors of production, labor and capital were also regulated through the system of kinship. Islam and specifically Somali custom guided the choice of marriage partners in part on the basis of the wider political alliances they would encourage. Rules allowing polygyny and strictly guaranteeing female chastity before and after marriage permitted pastoralists to disperse the family labor force as necessary to provide for the different needs of various classes of livestock. Inheritance patterns kept lands and livestock in family hands, usually in the male line.

Indigenous Systems of Production and Exchange

(a) Pastoralism

19. The vast majority of the Somali labor force is engaged in

pastoral activities. For the majority of the population pastoral production is the major subsistence mode. Most Somali cultivators also keep substantial herds, and even town-dwellers usually own a few animals. Few Somali own no livestock at all. Pastoralism is labor-extensive as well, in that it involves constant if not especially strenuous activity to care for the herds. Some animals (e.g., goats) are easier to herd than others, and some parts of the year involve less labor than others (e.g., in drawing water from deeper wells). In general, however, animal husbandry keeps all family members busy from an early age (in crop-growing families young children of nine to twelve are often responsible for the sheep and goats). The slack periods of crop farmers (during which times educational outreach, for example, can proceed) are much less pronounced among herders.

20. Pastoral production is carried out as household enterprise, with the senior male of the nuclear or composite household as herd manager. Individual animals may be owned by household members other than the head, and those owners may thereby have a subsidiary role in major husbandry and offtake decisions. As well, some animals may be in the herd on loan or on contract, and may not be alienable by the herd manager. Calculations of potential offtake from a herd must take into account the differential alienability of individual animals within it.

21. The mix of livestock species that one family holds varies according to local ecosystemic factors like disease vectors or the type of pasture available, to family fortunes and points in the domestic cycle, and increasingly to demand factors from the commercial sector. Table 3 gives, from the 1975 census, the average family herd by livestock types and by regions of the country, but the figures (a) are likely to derive from relatively inaccurate counts, and (b) certainly mask wide

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variation among families in both the numbers of animals owned and in the mix of species in individual herds. At the most general level Table 3 (and see Annex , Table) does demonstrate the higher numbers of sheep and goats in the non-agricultural areas of the north and the concentration of cattle toward the better-watered south. According to the census it is the intermediate climatic zone in the central rangelands that has the largest family herds in the country.

22. Grazing management is complex. It requires quick responses and great flexibility to take advantage of the sporadic and fleeting resources of water and grass in the arid lands where most pastoralists live. Somalis have adapted to their particular ecosystem in three primary ways:

- (a) By keeping goats and sheep plus cattle or camels (not often both of the latter), they make efficient use of the vegetation of individual and adjacent pastures and spread the disease risk;
- (b) By oscillating between dispersed grazing in the two rainy seasons to harvest the vegetation of areas as far from permanent water sites as is practicable, and more concentrated grazing in the dry season around the permanent water, they in effect practice a rotational system which reserves pasture for dry season needs; and
- (c) By subdividing the herd into segments, with the bulk of the camel herd (halweyn) tended far away from the rest of the family for much of the year by the young men of the family, and sometimes also by keeping wives as sub-herd managers in different locations, they further minimize risk at the cost

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of dispersing household members. (This strategy can complicate the task of extension education, since different decision-makers for any given sub-herd are in different places; but it is, of course, an entirely rational way to manage the family herd and the range resources.)

23. Herd Offtake in traditional conditions before the current era of intense commercialization (about which, see para below) is unknown. Somali did not have a culturally-elaborated emphasis on bull animals, and it may be presumed that male cattle and camels in excess of the number of potential breeders and workers were removed from herds early to increase the milk available for human consumption. In a pilot household survey in 1975 carried out by the Somali Central Statistical Department, sex ratios of the different animal classes held by settled farming and nomadic families were enumerated as follows:

Sex of Animals held by 104 households

Middle Shebelli Region, 1975

| | <u>---Settled Households---</u> | | | <u>--Nomadic Households-----</u> | | |
|--------|---------------------------------|----------------|------------------|----------------------------------|----------------|------------------|
| | <u>Males</u> | <u>Females</u> | <u>M/F Ratio</u> | <u>Males</u> | <u>Females</u> | <u>M/F Ratio</u> |
| Camels | .5 | 2 [?] | ← 1:4 | 190 | 404 | 1:2.1 |
| Cattle | 65 | 247 | 1:3.8 | 348 | 1776 | 1:5.1 |
| Goats | 98 | 347 | 1:3.5 | 715 | 4227 | 1:5.9 |
| Sheep | 19 | 58 | 1:3.1 | 414 | 2802 | 1:6.8 |

It is difficult to attribute complete accuracy to these figures, or to interpret them given the drought losses that could have occurred in the two years before this survey. It can be seen, however, that in virtually all cases the offtake of males is quite high and that the notion sometimes held that pastoralists build up their herds without considering the consequences is obviously mistaken.

(b) Cropping

24. There are households (hh 60000 in Bay) propel engaged in farming in Somalia, mostly as dryland farmers in the area between the Juba and Shebelli Rivers, especially in Bay Region. In addition, flood recession farming and traditional small-scale irrigation are practiced on the banks of the two rivers. Despite the statement sometimes made that farming is of recent introduction of Somalis, in fact farming has been practiced for at least four centuries.

25. As elaborated in Annex , dryland farms average about five hectares in size. With technology based on the hoe, the area actually cropped is primarily a function of labor availability at the peak period of demand during weeding. Farm families average between five and six people. Those farm families with more labor available are likely to hold more livestock and to devote that labor to its husbandry: it appears that throughout the period for which there are any records, the use or sale of livestock products has given more benefit than additional investments in croplands. There is little data on the size of holdings per active crop worker--i.e. that control

for the size of the family and therefore would permit discussion of class distinctions among farmers-- or of the use of the labor of hired help or sharecropping clients. A summary of the data available on farm size, labor demands, and yields is given in Table 4. In these circumstances it is impossible to discuss whether the growers of most of the non-subsistence crops, or the innovators of new crops, animal or tractor plowing, or schooling for their children are from any particular layer or type of the dryland farming families.

26. In most areas of dryland farming the main crop is sorghum, with several local varieties. Pulses may be interplanted with the sorghum, and sometimes millet and maize are also grown. The total area cultivated in any one year is divided into several plots in different areas; this practice and that of low plant densities on the plots maximize the farmers chances, in local conditions of highly scattered rainfall and no land scarcity, of having enough moisture so that at least some of his planting comes to full harvest. Field preparation is minimal except when the brush of a fallowed area needs cleaning. Seeds are dibbled or broadcast and slightly ridged while being covered. Weeding is the most time-consuming of agricultural tasks, and thus proves the major bottleneck to expanding the area under cultivation. No inputs of insecticide, herbicide, or fertilizers (not even deliberate manuring by the local herds prior to planting) are used. Since local varieties are interplanted and have different maturities, harvesting is of individual heads of grain by the use of knives. The crop of the second shorter rainy season ^{Nov/Dec} (deyr) is less likely to succeed than that of the longer gu, but if the year is a good one farmers store as much as they can--up to three years' worth ^{Apr/May - Harvest Aug} has been observed and farmers

report stored grains lasting ten years--in shallow pits lined with leaves, covered with branches, and sealed with soil. In all cases crops are the personal possessions of the household that grows them, although fields may revert from the household to the wider lineage group if they are permanently abandoned.

27. Traditional irrigation takes place in two ways: by successively planting the alluvial soils along the rivers as the flood recedes, and relying on both the residual moisture and on rainfall; and by the construction of irrigation channels from run-off streams or the rivers. In both cases, for obvious reasons of water use optimization, fields are smaller, closer together, and have higher planting densities than in rainfed areas. Maize is the staple crop, but beans, fruit, cotton, and sugar-cane are also grown. Technology is similar to that of the dryland areas. Labor demands are higher for the preparation of the generally heavier soils and for the maintenance of irrigation works. On the other hand the greater potential for cash incomes from the wetland crops, as well as the greater prevalence of tsetse along the rivers, correlates with the generally smaller livestock holdings of irrigation farmers. Again the mix of variables such as types of labor availability (adult, child, hired, etc.) size of holdings, and returns to labor for different crops are not well enough known in any of these farming systems to be able to say what the probable effects of such factors as price changes or reliable input supplies would actually be.

28. Other farming systems are even less well described in the literature than the above and are less significant. These indigenously developed systems include: ox-plough cultivation of the Northwest Region; temporary cultivation of many small areas in abundant rainfall

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conditions (wherein nomads may opportunistically scatter seed, protect the plot with a thorn fence and return later to harvest); run-off (tug), diversion of Sanaag and other regions in the north ; date palm cultivation in the northeast; and vegetable gardening (including, recently, a rapidly growing number of cassava farms) around Mogadishu. As well, the agriculture practiced by riverine peoples who spend large amounts of their time working on various plantation schemes is also unstudied.

29. Social factors in indigenous agriculture include the mechanisms which distributed workload and risk and therefore guaranteed a minimum of security except during general calamities. Land clearing, and the construction of wells, water harvest tanks (uar), irrigation channels, and minor public works were all often carried out by community collaboration: membership in the group, whether acquired by birth or adoption, implied both acceptance of the tasks to be shared and the right to claim help in time of need. Clan and lineage organization and membership entailed a guarantee of security of tenure and the obligation to share in the compensation that might be assessed against one's group for damages caused by any of its members. Whether a strong principle in favor of generous redistribution of grain surpluses existed is not known: in some areas of Africa this factor helps account for the situation in which individuals, rather than reinvest in crops or hire labor, invest instead livestock, which can be loaned out or "hidden" in distant herds.

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Standards of Living

30. [Text to come, including notes on health, shelter, education, income and expenditure distribution, insofar as known.]

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II. The Role of the State in Social Transformation

The indigenous fabric of Somali society and culture is still intact. Indigenous cultural and economic systems have enabled Somali people to exploit a harsh environment and to implant their influence over a physical area quite large by comparison with most other Eastern African ethnic groups. The southwestward expansion of Somali pastoralists and cultivators has ensured the "Somalization" of the peoples from the south who pushed up into the coastal and riverine settlements of the southern part of the country, Somali pastoralists are increasing in numbers in neighboring Kenya, and Somali entrepreneurs have migrated both south and northward across the Gulf of Aden. Somalia has continued to generate poets, religious and political leaders out of the resilient internal processes of her own culture. The eighty per cent of Somalis who live in rural areas still provide most of their needs either by themselves or out of resources available in their own local areas and from their neighbors and kin.

Yet obviously there have been profound changes in the society as well. Most of them have been brought about by the growth of the state political, administrative, and development apparatus over the course of this century so far. It is not the task of this annex to trace the details of Somali colonial history, but to understand the forces which underlie the development effort in the country it is necessary to analyze some of the effects of the growth of the state.

The Monopolization of Power and the Decline of Traditional Political Structures

The colonial territorial governments among the Somali, and especially the independent republic, have deliberately sought to substitute their political authority for the older authority of the clan structures.

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As the state has monopolized the use of force, the relevance of the clans and the contractual dia-paying groups in guaranteeing physical security has declined. Every successive government in the country has exerted a firmer control of the instruments of force and a parallel stronger determination to eliminate the influence of clan structures at least in the domains of politics and of conflict and its resolution. There is debate as to exactly how far clan loyalties have been eroded- one authority points out that there were about as many candidates for the 1969 elections in the country as there were dia-paying groups, and that even today despite official discouragement, clan ties provide the individuals primary identity. If clan still provides a social "address," however, it does not provide firepower: the government now effectively makes use of its powers of coercion to ensure that its policies are carried out, while other bureaucratic agencies--for example pension schemes for civil servants or insurance companies--have increasingly taken over the payment of various kinds of compensation. In the settled villages, moreover, the appointment of village chiefs is now firmly under the control of state authorities. The position at the moment is that day-to-day matters of local interest are still being worked out mainly by local political processes, but the fundamental matrix of policy is now in the hands of the state.

Urbanization and Migration: Employment Outside Agriculture

The expansion of the colonial and post-colonial state structure, together with the accompanying economic changes, has had a dramatic effect on the pattern of urbanization in the country. First, the raisons d'etre of the coastal settlements have been transformed. In the past they were the entrepots of the dhow trade, sited where harboring and fresh water

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were available, and where access to the hinterland was favorable, at distances about a day's sail apart. While in some areas political influence spread from the port over the hinterland, for the most part the interior was politically autonomous, and the relationship to the coast was cast in commercial terms alone. In the modern period, a few coastal settlements have added major administrative and economic functions (Kismayo, Berbera, and especially Mogadishu), but most others have gone into steep decline (e.g., Adale, Mait, Zeila) as the dhow trade declined and as economic and administrative functions were focussed along inland commercial routes. Second, this new pattern of urbanization concentrated activities in a few locations.

Hargeisa has grown from a tiny settlement to being the country's second largest city by reason of its favored situation as the colonial administrative center for the British protectorate in the north. Above all, Mogadishu has almost achieved a heavy urban dominance

as political, economic, industrial, administrative, higher education and cultural functions have all been aggregated to the capital. With 10% of the country's total population, Mogadishu is now experiencing the difficulties of providing jobs, amenities and services that might better be handled with greater decentralization of urban activities.

The growth first of the colonial administration, second of the commercialization of agriculture, and third of the independent Somali public sector has provided wholly new occupation types in the country. Wage employment (..% of which is directly for the state) has become something that herders and crop farmers all over the country perceive as a real possibility for at least some of their children. So much is this so that some nomads are spending as much as So.Sh. 4000 a year to board a child of

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primary school age near a village school. Some of the aspiration for wage employment will be realized, of course, abroad on the Arabian Peninsula. Most children may not finish school and may, if they find employment at all, find it at levels that require only muscle-power, not academic skills. Be that as it may the current situation is that increasing numbers of rural families, even when not forced to migrate en bloc to the towns through the loss of their livelihoods through drought or ill fortune, are sending one or more children to the urban areas to diversify their sources of family income. Whether their expectations that sustained remittances will be forthcoming and will repay the investments in schooling and the opportunity costs of lost family labor remains to be seen. Nevertheless, urbanward migration is now taking place on a major scale in Somalia and must be understood as an expression of confidence in the relative ability of urban employment to generate supplementary family income.

Intervention in Production Systems

From the time of the earliest appearance of colonial interest in Somali territory there has been intervention in the conditions of agricultural production. At first this interest was commercial, and in the livestock sector the influence of the state has been mainly limited to conditioning the trade flow in livestock. In the crop sector influence has been more direct. Recently the state has intervened with increasing intensity for ideological, strategic, and political reasons. The overall consequence of this history of state involvement in agriculture has been the emergence of an embryonic system of social class, as will be elaborated below.

The commercialization of livestock. The earliest interest of the British in the northern Somali coast was as a source of meat for their

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expanding garrison at Aden. Trade in pastoral products (and those collected in the wild) was ancient, being first recorded in detail from both coasts fully 650 years ago. Trade of live animals, ghee, hides and skins was entirely in private hands, organized by brokers between pastoral producers themselves and merchant exporters, with some market dues going to the chiefs of the port communities. In the twentieth century the trade has grown enormously (its current scale is detailed in Annex); the oil boom periods of the Arabian peninsula first in the 1950's and then in the mid-1970's have funded huge new demands. In Somalia production has remained with nomadic families--there has been no substantial change in the organization of production itself. The orientation has changed, though, from primarily subsistence to primarily market pastoralism. Commercialization has undergone this significant intensification while remaining virtually entirely in private channels. Private traders have invested in water storage units to localize production, in a transport fleet to move animals to market and port in hay production activities (building exclosures in good rangeland) to support the international movement of the live animals, and in collective efforts to increase government support of their positions and to routinize commercial transactions to better serve them. Government has responded to the importance of the livestock sector for overall government revenues by improving port and road infrastructure by supplying animal health supervision, by organizing a payment transfer system that enables the exporter to profit as well from imports he can buy and ship with part of his livestock sales proceeds abroad, and by otherwise not intervening in the commercial sector to the degree that has been true for commodities traded by less influential, sometimes non-Somali, merchants.

The acquisition of the river valleys.

Those Somali who were historically fortunate enough to acquire the lands along the two rivers have now all but lost them to large-scale private and public interests. Such lands were traditionally claimed by clans or village groups, but relatively little was actually used by them on a continuous or intensive basis. As in many other countries, the colonial powers held that lands not actually being intensively used were fair game for government purposes. Thus, starting in 1908 with the Italian scheme for concessionary agriculture to help pay for colonial administration and to supply tropical products to the metropole, large tracts of the best-favored riverine lands have been acquired for crop production in large-scale enterprises. The first of these were for private banana plantations and the Jowhar sugar estate, but the right of eminent domain has been asserted by each successive government to requisition land for large-scale crop schemes. In some early cases there was acknowledgement of traditional tenure, since the land was purchased from clan elders (who may not have had any clear right in customary law to alienate it). More recently compensation has only rarely been paid or sought, with the population apparently "content to profit from the labour opportunities and increased circulation of wealth which the projects offer" (Lewis 1967:22), or at least not inclined to protest very sharply. As irrigation canals were built away from the rivers themselves, additional lands were taken over for plantation crops. Some of it was developed, then abandoned, and sometimes repossessed as the economics or technology of various crops fluctuated. There has been no attempt to account for how much irrigable lands and of what quality, remains in the hands of

villagers. It may be assumed, on the other hand, that the 209 banana plantations on the two rivers, together with the existing irrigation projects and state farms on both rivers occupy virtually all of the high-quality lands. In all, the 1977 Hunting Report records that 35,000 ha were under controlled irrigation (27,000 ha on the Shebelli and 7,500 on the Juba). While some of these lands were being occupied at least temporarily by small-holders, most were held by large farmers (many of them the Somali successors of Italian concessionaires) and the Government. More importantly, there are identified at least 47,000 additional hectares for large-scale irrigation development: indeed, as the Hunting Report notes, "the great bulk of the investment on the rural sector is to be devoted to the construction of new irrigation schemes" (p.33). If this development were technically possible (see Annex ___ on Water Resources), it would complete the takeover of even presently flood-irrigated bottom-land from traditional producers. The data being sketchy at best, it is not our point here to measure the present balance of small holdings to large. Rather, it is the overwhelming trend not just to controlled irrigation technology but to the permanent alienation of lands from their traditional owners that is the central point of social relevance.

Early outreach to small producers. The two preceding paragraphs indicate the extent to which new interests implanted themselves within traditional production areas. There were also a few attempts to improve conditions for small producers themselves, but these were pale even by comparison with other African colonies. In the former British colony they were of a highly limited nature, consisting of the creation of small veterinary and medical programs, the construction of a handful of schools and a few roads and boreholes, and the beginnings of a system of land registration

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for the agricultural holdings of the northwest and the forest gum production areas to the northeast. In the south the offer of wage employment on the what were to be models of progressive concessions turned frequently into the impressment of labor that had to be guarded to keep it on the fields. The building of a chain of schools and medical facilities evidenced the early Italian motivation to "uplift" the population, but the agricultural experiments run at Genale and Villa d'Abruzzi were solely directed at plantation crops. After World War II governments slowly extended health, education, and administrative services. For the first time there were experimental programs in farmer credit, water catchment construction, grazing rotation, farm mechanization, animal traction in the south (it was of course innovated indigenously in the northwest), as well as the beginnings of agro-industry. But until independence there did not occur anywhere in Somalia any attempt at all, to cover the countryside with any service or administrative demand: there was not even the collection of a head tax or an animal tax that might have brought government into contact with the mass of the population.

The Growth of State Organizations. Since independence, and especially since the 1969 revolution, the activities of the state in the countryside have accelerated considerably from their low previous level. To understand the reasons for the particular programs undertaken and their consequences, it is necessary to see them in the context of the evolving nationalist and socialist commitments of the country. We do not here specifically discuss the pre-socialist period as such, but rather those lines of policy, whenever initiated, which have had major impact in the countryside.

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a. The Socialist Commitment. The declaration in 1970 of the socialist nature of the Somali revolution reflected the country's growing consensus that the continuation of policies begun during the colonial period could not break the chains of its poverty. It also declared a will to effect change in the countryside after a decade of drift in development terms. These three strands of thought-- ending neo-colonial subservience, ending national poverty and changing the face of the countryside--have dominated development policy since.

(i) Ideology and Education. The colonial experience had engendered a strong sense of national injury among Somali. The national territory had been divided, allocated and reallocated among foreigners with no consultation of Somalis. By comparison with her colonial neighbors Somalia had been clearly neglected. At the beginning of the 1970's the new government determined to overcome this sense of disinheritance, this marginalization. It resolved a long debate by adopting the roman script for writing the national language. It embarked on two major literacy campaigns, the first in 1973 in the cities to spread familiarity with the written language, and then in 1975 throughout the country with the Adult Literacy Campaign. Even though the major drought had struck and the literacy workers were diverted to the relief effort, within a few months 854,000 Somalis, nearly half the adult population, had become sufficiently versed in their language to earn certification of their literacy. For the first time, a mass mobilization in the countryside had been undertaken, and it worked. In the circumstances the boost to national self-esteem may have been as important as the technical result: since there were few materials available to sustain the new reading skills, many people (one survey in 1977

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said 50 %) soon relapsed into non-literacy. But the demonstration of education as a tool for participating in the nation was also effective. Primary school enrollments, at only some 70,000 in 1974, rose to nearly 200,000 in 1976, and more and more rural parents were beginning sacrifice the value of their children's labor and (for nomads) the cost of boarding in order to keep the children at school.

(ii) Implementing scientific socialism in Development. Government's determination to eliminate the vestiges of colonialism and to force the pace of economic growth has given rise to a number of interrelated policies. Among these the most notable have been the following:

- the nationalization of the banks and the creation of the state
- export and import trading monopolies in many items, in order to try to control elements of commerce felt to have been bleeding the country;
- the holding down of wages in the public sector, in order to try to prevent the use of government service to amass wealth. The wage scale has not been amended since 1969 except for the lowest-salaried workers (although allowances have been changed), so that after inflation the purchasing power of salaries has seriously declined. Appendix I of this Annex outlines public sector compensation levels. Reaction to this squeeze has been of two types: out-migration to jobs on the Arabian peninsula (at salary levels which Somalia could probably not match anyway), and at least as importantly a massive diversion of attention from official duties to pursue business ventures outside official duties.

- rapid expansion of the state sector in crop agriculture, and especially in irrigation. Annex describes in detail the Crash Programmes and State Farms and the present and proposed state or joint-venture projects in irrigation. All of these stem from convictions, stated in explicit policy or not^{1/}, that crop enterprises offer the best hope of rapidly increasing national output and of substituting domestic products for imports, that state organization of these enterprises should be the most direct way of effecting these increases since technical and labor inputs can be fully controlled, and that irrigation, of course, more fully guarantees yields of high-value crops.
- Most of these convictions are shared by other countries of far different political persuasion. They grew firm before the turn to scientific socialism and before the drought. These two events merely deepened Somalia's own commitment to state production and irrigation as a guarantee for the country's food security. Yet, as Annex makes clear, faith in this direction has not been rewarded.
- the creation and spread of cooperatives in agriculture, trade, and industry. The extensive organization into cooperatives was clearly meant to reach small producers and to help achieve the socialist transformation within the country. The cooperative Law (no. 40) of 1973 envisaged western-style service cooperatives only as a prelude to the full collectivization of production--

^{1/} For example, the Ministry of Commerce and Industry, in a pamphlet describing the Crash Programmes, states as their objectives: (a) creating job opportunities, (b) promoting transformation of the land tenure system, (c) increasing food production for the country, (d) orienting youth to modern farming (e) motivating cooperation and spirit among youth. These goals speak to legitimate national needs

service or "multi-purpose" cooperatives and group farms were "lower type Cooperatives, while the transition to higher type cooperatives (collective cooperatives) shall be the final stage" for the "future socialist pattern of the economy."^{1/} In the absence of effective extension or a strong tradition of cooperative labor, the inducement to farm cooperatives and group farms in the crop sector (and grazing associations or traders cooperatives elsewhere) was to be the provision of free or highly subsidized government services including, notably, tractor plowing. Government intervention has had technical and morale problems, however. As a result, attempts to organize and manage collective responsibility (especially on group farms, which were to be small-scale collectives by volunteers on surplus land with government support) have failed, and the Cooperatives Department has reverted to a policy of total individual responsibility for plots within the farm. No full-scale collectives of the third stage have yet been organized and doubts have been expressed as to whether they will be.

b. Redistributing population. A final aspect of policies to break the poverty of the countryside has been the strategy of resettling the population. It is important to note that this social strategy had been proposed before the drought, and is only part of socialist strategy as a secondary matter.

^{1/} Quotations from Law No. 40 of 4 October 1973 as printed in Agricultural Cooperatives in Somalia: Handbook, Ministry of Agriculture, Mogadishu, 1977.

The policy arose for two reasons. First, it is difficult and costly to bring administrative and social services to a dispersed and mobile population. This fact had early suggested to the Somali government, as it has to many others, the cost efficiency of getting nomads into large, settled communities. As well, the commitment to large-scale irrigation development implied the growth of a labor force for irrigation well beyond that available from neighboring villages. No overall calculations of labor force recruitment to the total range of projects was ever done (with the result that there has been serious competition for labor and some shortages even of unskilled labor on the Juba and in the Northwest). But the ILO/JASPA study estimated (p.43) that 27,800 laborers would be necessary for the agricultural projects of the 1974-1978 Plan period. It was in this setting that the drought struck in 1974-75. Suddenly the attention of the nation was riveted

not only on the need to care immediately for those thousands of pastoral people bereft of their livestock, but also on the prospect that all future population increase in the pastoral sector should be absorbed outside pastoralism to avoid any further charge on the rangelands. The creation of the Settlement Development Agency in 1977 was the concrete response to the emergency situation, but the policy of attempting to redistribute population has taken diverse forms, as follows:

- The Crash Programmes, as noted, were to provide employment training and started by recruiting from the ranks of the urban unemployed, whose numbers had disturbed the new government already by 1970. The five Revolutionary Youth Centers, created in 1974, are further institutions for training and education, mainly at younger ages, of orphaned or unattached children.

- sedentarization of Somalia's nomads is generally understood to be national policy, though it has never been explicitly elaborated. The 1974-1978 Five-Year Development Programme called nomadic pastoralism a "tradition ridden mode of production" (p. 21) and called for its "transformation into a more secure and productive one" (p.38). It may be fortunate that the policy has not been pursued for its own sake, because world-wide experience has shown that premature and/or forced sedentarization of pastoral peoples simply does not work short of massive coercion. Creating the conditions under which pastoralists do not have to nomadize to find the resources of water, forage, minerals, craft materials, market opportunities, and other necessities of their lives provides the only basis for encouraging their settlement. the resettlement schemes proper were the response to the drought emergency. In all 105,000 people were taken from nearly twenty refugee camps and resettled in the three large agricultural settlements of Dujuma, Sablale, and Kurtun Warey (90,000 total) under Settlement Development Agency responsibility, and the four fishing communities of Eil, Adale, Brava, and El Hamed (15,000 total) of the Coastal Development Authority. As Table 4 indicates, the population (especially of adult males) in the agricultural settlements has declined steadily and is now at 56% of the original total. Moreover, their performance as agricultural production organizations been extremely poor to date, three years after their founding. The population of the fishing settlements has held up, but the number of boats

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actually working has declined to 12 or 15 % of those originally available for reasons fully discussed in Annex . Thus it should be clear that even if these communities eventually become economically self-supporting, the huge start-up costs that will have been involved obviously preclude the replication of this technique of resettlement to any major degree.

Nonetheless, the ILO/JASPA employment study predicted that from 1977 to 1981 Somalia's population would grow by 414,000, of whom the 186,000 in the pastoral sector should probably, it argued, be moved into other pursuits in order to protect the range (ILO/JASPA, pp. 25-26). If government accepts this position, and to the extent that resettlement is not spontaneous, it is clear that new strategies will have to be devised to accomplish whatever resettlement task government takes upon itself over the long term.

Summary and Consequences: The growth of Class Differentiation in Rural Somalia

Traditionally Somalia was a land where class differences were very small. The classic work on northern nomads is I.M. Lewis' A Pastoral Democracy (1961), so called because of the strong political and economic egalitarianism of virtually all household heads. In the agricultural areas there was somewhat more hierarchy of political power than among the nomads, but still general equivalence of access to resources within each clan's territory.^{1/} Lewis also spoke of townsmen as the extension of lineage groups in the countryside rather than as an urban class apart (1961:94), and said that

^{1/} I.M. Lewis, "From Nomadism to Cultivation," in Mary Douglas and Phyllis M. Kaberry, eds., Man in Africa, London: Tavistock, 1969. Pp. 59-77.

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Somalia's lack of resources had produced even during colonialism "little diversified class structure" (p. 267). While there may be some debate about the past as Lewis has portrayed it, there can be little doubt that sharp differences of income have emerged. Tables 5A and 5B show the extent of these differences for the public sector as a whole and for a single agro-industrial enterprise, the sugar estate at Jowhar. The wages paid to civil servants and unskilled laborers at all the State Farms and other agricultural enterprises and at the project construction sites are roughly equivalent to those in this single example. Unfortunately the size distributions of different shares of rural wage income cannot be calculated, since the total numbers of workers at different wage levels are not compiled in any one record.

Differentials in the rural wage sector are only one small element of a nascent class structure. Cash income from the sale of labor or of surplus produce accounts for only a part of the total income of rural farming families. The larger share is still from subsistence production. Thus a part-time plantation worker who in addition raises most of his food and sells some of his crop surpluses may be better off than a full-time skilled worker whose sole income is his salary. The distribution of total income has never been researched, but it is still possible to speak of an emerging class system. This is because differentials of power, of access to strategic resources, and of life chances - "opportunities" - are now cumulating in Somalia in ways that make the lives of people in different classes substantially distinct. While some individuals may overlap two (or more) categories, it is now possible to speak of at least the four following classes in rural Somalia: (a) the agents of the state, (b) rural

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wage workers, (c) the "mobilized" rural producers (d) the residual masses.

(a) The agents of the state are those middle and higher level salaried workers whose jobs put them into rural areas at least at some periods in their careers. They are the managerial, technical, and skilled workers on state enterprises, including foreign assistance projects, state farms, agro-industries, and district and regional administration. Their jobs are relatively secure and do not depend on their productivity in economic terms or even their day-to-day health in the way that a herdsman's or a farmer's income does. Though their numbers are small, they control the fine detail of life in the rural areas: they decide which laborers may be hired, have access to transportation, determine what local suppliers will be favored or whose service needs will be met first, administer regulations and justice, supervise a variety of government operations from purchasing grain to distributing food-for-work. They have ready access to communications channels and are well versed in their use, so their own needs are easily articulated. Like their urban counterparts they have time and resources to engage in business concerns outside work. Because they know the bureaucracy, they can more easily provide their children the help and education they will need to retain high status. Given that control of crucial means of production and redistribution of the social product is in the hands of the state, these people, its local representatives, are all-important gate-keepers to government resources. Simply by being there, they become major local

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political figures. To the extent that the government role in the countryside increases, they become ever more significant. A parallel group in the private sector in the rural areas, made up largely of merchants but also including some plantation owners, is in the same class position. It is defined by its public sector segment because its existence as a class, as we have seen in discussions of livestock commercialization and the nationalization of certain enterprises, is so heavily dependent upon public policy.

(b) Rural laborers. This class is like the first in owing its existence to the activities of the state, and in depending on cash for many or most subsistence needs. It consists of construction and plantation workers and the lower-level staff of agro-industries. Much of it is made up of part-time laborers who, in the main, retain claims on animals or land in the subsistence/produce marketing sector. Little is known of their total earnings or their methods of managing jobs with their own production enterprises. Obviously it is not a transitional group, for the size and permanence of this class has grown with the enormous expansion of state enterprises in the last few years, and it will grow further if present policies continue. With some education and an increasing dependence on wages, its interests in such secular services as health and education are similar to those in more active control of the wage sector. But it will realize its aspirations for steady employment or for better opportunities for its children only if the state itself fares well, because as opposed to the first class, whose jobs are quite secure, the number and duration of jobs for this class fluctuates widely. Petty traders also probably belong to this class,

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since their livelihoods also depend on the circulation of cash in the rural economy. For all of the members of this class, political power is not a question: often their jobs are far away from their true homes, and the very servility of their status on the job lends them no confidence in their positions. On the other hand they are certainly not a rootless or landless class, either.

(c) The "mobilized" rural producers. This class has been produced by its members' own initiative and contacts with the state and its structures. They are the clientele of development projects and the administrative apparatus: the members of cooperatives, the attenders of adult education classes, the local political leaders of small communities, the members of livestock grazing associations, the adopters of new technology introduced by agricultural and fisheries agents, the nomads trained as fishermen or farmers in the resettlement programs. Through some dynamic of their own resourcefulness, their good connections with the first class, or their fortunate location, they are the ones receiving a high share of those services the state offers. They do not rely so much on the state as the first two classes: rather, they benefit from it. As its beneficiaries they can also be called upon to support it, and they form the bulk of the membership of the mass social organizations that regularly rally in regional headquarters and provide the hard core of the supporters of the party. Because they earn their livelihoods independent of the state, they are more insulated from changes of broad policy than the rural laboring class. They, too, probably send high proportions of their children to school as a wager on the urban economy, but their children are more firmly rooted in ongoing community life than the more frequently transplanted members of the first

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two classes. As irrigated land or improved range is made available to small producers, this is the emerge in possession of the lion's share of the best resources. Historically, for example, nomadic sedentarization has usually led to increased social differentiation--those mobilized for quick exploitation of new opportunities will come out on top. This class is not necessarily a "progressive" class, however. Traditional society encouraged quick appropriation of available resources, the difference being that those resources (like fresh grass) were only temporary themselves. A class mobilizing its own energies can also be a class most orthodox religiously or most loath to share any newfound opportunities.

(d) The residual masses. It remains a fact of national life in Somalia that a large majority of rural crop and livestock producers carry on beyond the reach of the agents of government. The prices they get for their products, or the availability of goods they buy, or the circumstances of their access to facilities depend heavily on government policy, but they are only passively constrained by those policies. The primary goal of their production is for their own subsistence, though their choice of subsistence techniques is affected by market conditions. Many cannot afford to give up their children's labor to have them attend the tuition-free schools, or if they are nomads cannot afford the boarding costs. By definition they are the last to be exposed to development projects, and before the benefits reach them the projects may run out of resources. In the nomadic areas they are the ones, for example, now losing range areas to fodder production, being reoriented by the siting of wells or ranches without much consultation, and being disrupted by the continuing difficulty in having unrestricted access to the Haud

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summer pastures. Whether nomads or farmers, they are the most remote from government, but probably the most directly affected by natural forces. So they form the class from whom drought refugees have flowed. While they own not inconsiderable standing wealth in the form of land or animals, they are the "poorest of the poor" in terms of their chances of improving their lot. Whether they will ever move into the ranks of the "mobilized" producers depends on the cost-effectiveness of government strategies in extending services to cover their needs before other classes consolidate their positions. Thus government has clear choices to make about the future of this so far neglected class.

(e) Summary. Any analysis of class differences necessarily relies on qualitative factors beyond sheer quantities like the distribution of income. It is thus inevitably more subjective than discussions of numerically-based issues. In raising questions of the emerging patterns of differential influence, opportunity, and income we cannot claim to be definitive. We have merely attempted here to stimulate further consideration of, and especially research on, such matters. The value of class analysis is to focus the attention of all the interests involved on the ways in which policy implementation and (other social forces that may be beyond government's influence) are affecting the society in broad terms. The classes we have identified are not necessarily fixed, nor are they in overt conflict. Since we have not discussed urban class interests or the class structure of the whole nation, much analysis remains to be done. In the meantime there can be no doubt that class interests have emerged and do threaten to become more divergent in the future.

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III. Problems and Prospects in Social Development

Somali development policy is clearly and laudably devoted to the development of Somali people, and not simply to abstractions like the growth of the economy or of production at large. This commitment to the masses of the citizenry has been expressed in both the statements and the actions of the Government and of the Somali Revolutionary Socialist Party.

As general policies are translated into strategies for dealing with particular problems, however, there is the danger of diluting the original overriding goals. Some policy values may be in competition with others for priority. Strategies for achieving certain goals may subvert the possibility of reaching other goals at the same time. It is in the spirit of constructively monitoring the social effects of the agricultural development strategies that are now being implemented in the country that the following issues are raised.^{1/}

I. SELF-RELIANCE AND SELF-SUFFICIENCY: THE DIFFERENTIAL SOCIAL IMPACT OF STRATEGY CHOICES

The concepts of self-reliance and self-sufficiency have different implications at different levels of the society. Traditionally, for example, individual rural households were self-sufficient for most of their routine needs and self-reliant for the remainder by exchanging their labor, products and loyalties with others for clothing, social insurance and physical security. By contrast, in the contemporary national society

^{1/} See also the 1977 ILO/JASPA report, Economic Transformation in a Socialist Framework, pp.66-69, for an assessment of the contribution of particular projects to overall development objectives. Their summary table is reproduced here as Table 6.

physical security is provided by the State and a large fraction of the population, most obviously those in urban areas, must exchange their labor for virtually all their subsistence needs.

The Government is committed to the policy of self-reliance at the national level out of two major considerations. First, the country must be enabled to import the things which it does not itself produce. Second, it must build up its capacity to care for its people at the times of natural calamity over which it has little control. The first of these considerations primarily serves the urban population, because it is there where the bulk of import purchasing power now lies. The second, meant to provide national food security during droughts, can be met in a number of ways, by exporting high-value goods to build up national reserves, by raising and storing security food stocks, or by increasing the capacity of individual households and communities to withstand drought years.

So far, drought-proofing the nation appears to be taking precedence over drought-proofing individuals. Indeed, individual families and communities are becoming more dependent on outside forces rather than less so. This is because:

- strategies for self-reliance have favored large-scale crop production schemes rather than small-holder schemes, depriving small-holders of the best croplands and making increasing numbers of agricultural laborers dependent for their livelihoods upon management performance over which they have no control.
- strategies for distributing domestic foodstuffs, especially grains, have discouraged on-farm storage.
- national land and credit-policies outside the banana-growing areas have tended not to encourage capital improvements on farms and

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rangelands except under direct government sponsorship.

- the particular commodities favored for development or the ways of handling them (rice, fruits, meat for canning, fish) have been directed more to the urban or export markets than to the feedback effects into the domestic rural economy.
- insufficient attention to the diversification of export markets has made especially the livestock and banana producers highly dependent upon conditions in a handful of foreign markets.

In short, ways must be examined to increase substantially the efforts being made to achieve internal self-reliance and individual self-reliance at the same time as national self-reliance. These goals are not mutually contradictory. But pursuing national self-reliance primarily with an export-oriented strategy can put a heavy burden on the state as drought-proofer, when that burden could in fact be shared with individual producers, communities, and the internal marketing system.

II. SCARCE RESOURCES AND THE QUESTION OF EGALITARIAN DEVELOPMENT

Government is committed to an egalitarian policy of development, reflected in its wage and price policies, its careful nationalizations of key sectors of the economy, and its construction of a powerful mass political party to guide national policy. Yet its strategies of resource development currently run a strong risk of favoring a few rather than the many, and ultimately of excluding many rural producers from the potential benefits of development. Government must act with great vision to prevent the further crystallization of a pernicious class system in the rural areas.

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This issue arises because key land and water resources all over the country are being appropriated for particular purposes without any overall assessment at all as to how all the people will be served. If there were enough high-potential areas for everyone this question would not arise. To the contrary, it will at best be a very long time before the lands of good potential can be improved enough to carry, at reasonable standards of living, the population than can be anticipated to have to use them.

Favored rangelands are being appropriated by private traders for fodder production, holding areas, and by government for both its own ranch sites and on a first-come, first-served basis for grazing associations and cooperatives among willing nomads. So far there has been little complaint from nomads not included in these schemes, but we are forced to wonder whether the day will come when the large residual population will wake up to find that it has been squeezed out of all the good grazing lands.

There is a finite quantity of irrigated water currently and potentially available, and under various technologies and economic situations, therefore, a finite number of people can be supported on this resource. To date no application of an egalitarian-oriented strategy for maximizing the number of people who can directly benefit from the irrigation program has been attempted, nor even this variable of benefit spread been put into a mix of decision-making criteria. Yet soon it may be too late for smallholders to get any benefit at all except as rural laborers.

In mixed agricultural areas the provision of agricultural and social services has also tended to favor high-cost alternatives (tractors, hospitals) that can be replicated for everyone only over a very long term. Low-cost inputs and delivery systems in agricultural technology, extension services, health and education must take precedence (and indeed some efforts

in this direction are beginning) before a structure of favored and disfavored areas and individuals gets firmly fixed.

To summarize, rational over-all land-use and resource-allocation planning must be developed quickly to provide overall guidance to the piece-meal appropriation of resources now taking place. The proposal recently mooted in the National Range Agency for a national land-use planning unit ought to be pursued with vigor (whether in the NRA or not).

III. POPULAR PARTICIPATION IN DEVELOPMENT

Great strides have been taken by the Somali people and their Government to root development firmly among the people. The literacy campaigns, the self-help schemes (iska wax u qabso), the crash programmes and the mobilization of social organizations have all increased the readiness of Somali citizens to play a full role in their own development.

Yet there are recognized problems in maintaining the momentum that has been building up.

- By 1977-1978, primary school enrollments had fallen off to 80% of their 1975-76 peak, and fully 35% of those registered for Grade I in that year failed to appear for Grade II in the next year. There was, however, a tripling of intermediate education and a doubling of secondary enrolments over the same period.
- One survey, at least, has shown a 50% lapse of literacy skills among those who had earlier passed the test, while rates of completion of adult education courses are still very low (in 1978 74% of those enrolled in the final year of adult education took the exam, and of those who took it only 40% passed).
- Rural laborers hired by the day or the task in herding, on farms or in other activities can hardly be expected to build up much

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commitment toward conserving the resources in their care. Waste of precious irrigation water, starving of calves to maximize saleable milk by hired herders, "slaughter-tapping" of gum trees and general lack of concern for the long term are now beginning to result from practices which deny a worker his fair share of the rewards that can come from optimum resource conservation .

- Settlers in the agricultural and fisheries resettlement schemes, having benefitted from the massive government drought relief effort, are now leaving the settlements in large numbers. If this trend continues there is not only a grave threat posed to the viability of the settlements themselves (especially those in agriculture) but also to the larger policy which the settlement schemes have represented, that of sedentarizing what is supposed to be at least the excess population of the nomadic areas.

To come to grips with the theme of disillusionment or alienation that runs through these diverse situations, Government must structure systems of incentives and rewards so that people can build self-confidence and the knowledge that their own efforts in every field will be supported and sustained.

IV. MIXED AGRICULTURE BUT UNI-PURPOSE AGENCIES

In advanced production systems with highly specialized goals, individual enterprises can be serviced well by equally specialized agencies. In Somalia, however, for the vast mass of the population agricultural production is not specialized, and should and will not be specialized in the foreseeable future. So-called crop areas have large numbers of nomads and semi-nomads in them, and the settled farmers themselves gain a sub-

stantial portion of their income from the sale of livestock products. In many of the range areas there are possibilities for some agriculture, tree crops, or even fishing. Somali family agriculture enterprises normally engage in the diversified production of meat, milk, handicrafts, grain and other crops in some places, the collection of wild products for sale, and the part-time sale of labor power.

In this situation it makes little sense for each specialized agent of a different government institution to address the Somali small producer in isolation.

- The logistics and management problems of fielding different corps of service agents with sufficient coverage to have a substantial impact are very costly and redundant.
- Should the crop farmer, for example, follow the advice of an animal husbandry man who tells him to turn his crop residues into silage, or that of a crop extension agent who urges him to plow his residue back as "green manure"?
- Who will know enough about the total situation of individual families-their available labor, demands of their herds, their claims on land and water resources-to give those families adequate information on which to base their production and investment decisions?

In a few current projects these questions are starting to be addressed through the concept of a multi-purpose extension service integrating a number of agencies and ministries. It is obvious that this integration needs to be followed through on a country-wide basis. In addition, the autonomy granted to regional and district ministry representatives under the lead-

ership of Governors and Commissioners needs to be clearly and forcefully structured so that local problems can be addressed when necessary by a fully collaborative team approach.

V. MISSING INSTITUTIONS: TOWARD AN INFORMED SOCIAL POLICY

In the last ten years social policy in Somalia has been made by increasingly wide consultations with the Somali people. But the institutions which might gather the information upon which such policy might be more knowledgeably based are lacking from the array of agencies dealing with rural society.

- The Somali Academy of Arts and Sciences has just been expanded to include social science research, but no budget or staff have yet been added to begin research toward Somali social development.
- Individual ministries have research sections within their planning departments, but they are either under-staffed or not staffed at all. If they did begin to develop their research arms, it would undoubtedly be with technical (agricultural, animal production, fisheries) research workers before the regional planners, general ecologists or sociologists who would examine each ministry's mission in a wider social context.
- So far social sciences other than economics have been taught in the national university's Faculty of Education, whose main mission is to disseminate existing knowledge to prospective teachers rather than to expand the frontiers of knowledge for the purpose of intermingling action for national development.

There is , in short, a pressing need to accelerate the mounting of full-fledged, action-oriented research in such fields as demography,

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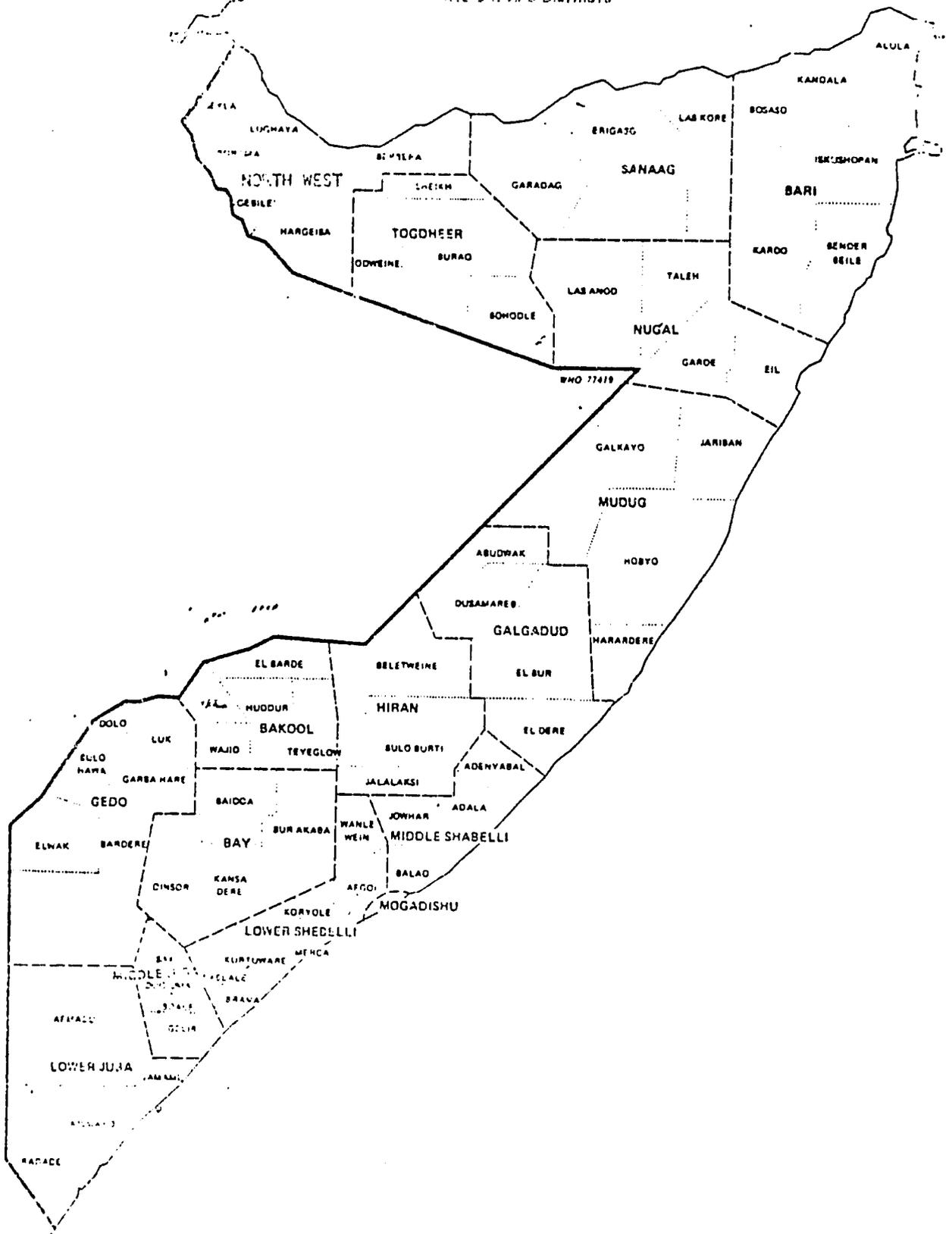
social anthropology, sociology, regional planning, and policy studies. By monitoring on-going social change and analyzing existing social conditions, these social sciences can help to ensure that the strategies chosen by policy-makers reach their objectives in ways that are most beneficial to the largest number of people. The government should consider a program whereby the proposed Social Science Directorate of the National Academy can be fully developed to do research relevant to development needs.

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TECHNICAL NOTE ON PUBLIC SECTOR COMPENSATION LEVELS

(text to be inserted here)

SOMALI DEMOCRATIC REPUBLIC
REGIONS AND DISTRICTS



SOMALIA

AGRICULTURAL SECTOR REVIEW

Population, Area and Population Density by Region

| <u>Region</u> | <u>Population</u> ('000) | <u>Area</u> ('000 km ²) | <u>Population Density</u> (population/km ²) |
|---------------------------|------------------------------|---|--|
| I. <u>North-West</u> | <u>698</u> | <u>86</u> | <u>8.12</u> |
| Wagoyi Galbeed | 440 | 45 | 9.78 |
| Togdheer | 258 | 41 | 6.29 |
| II. <u>North-East</u> | <u>386</u> | <u>174</u> | <u>2.22</u> |
| Sanag | 145 | 54 | 2.69 |
| Bari | 154 | 70 | 2.20 |
| Nugal | 87 | 50 | 1.74 |
| III. <u>Central</u> | <u>397</u> | <u>113</u> | <u>3.51</u> |
| Mudug | 215 | 70 | 3.07 |
| Galguduud | 182 | 43 | 4.23 |
| IV. <u>Shebelli River</u> | <u>1,188</u> | <u>82</u> | <u>14.49</u> |
| Hiraan | 147 | 34 | 4.32 |
| Mid. Shebelli | 263 | 22 | 11.96 |
| Low. Shebelli | 398 | 25 | 15.92 |
| Benadir | 380 | 1 | 380.00 |
| V. <u>Juba River</u> | <u>651</u> | <u>116</u> | <u>5.61</u> |
| Gedo | 212 | 32 | 6.63 |
| Mid. Juba | 216 | 23 | 9.39 |
| Low. Juba | 223 | 61 | 3.66 |
| VI. <u>Inter-Riverine</u> | <u>402</u> | <u>66</u> | <u>6.09</u> |
| Bakool | 100 | 27 | 3.70 |
| Bay | <u>302</u> | <u>39</u> | <u>7.74</u> |
| <u>Total</u> | <u>3,722</u> | <u>637</u> | <u>5.84</u> |

Source: 1979-81 Three-Year Development Program, Table 19-1.

SOMALIA

AGRICULTURAL SECTOR REVIEW

Population by Settlement Type, Region

| Region | Total Pop. ('000) | Nomad: | | Settled: | | Non-Agricultural: | |
|--------------------|-----------------------|----------|----|----------|----|-------------------|-----|
| | | Subtotal | % | Subtotal | % | Subtotal | % |
| I. North West | | | | | | | |
| 1. W Galbeed | 440 | 271 | 62 | 118 | 27 | 51 | 12 |
| 2. Togdheer | 258 | 198 | 77 | 42 | 16 | 18 | 7 |
| Sub-total: | 698 | 469 | 67 | 160 | 23 | 69 | 7 |
| II. North East | | | | | | | |
| 3. Sanaag | 145 | 113 | 78 | 22 | 15 | 10 | 7 |
| 4. Bari | 154 | 116 | 75 | 27 | 18 | 11 | 7 |
| 5. Nugal | 87 | 66 | 75 | 15 | 17 | 6 | 7 |
| Sub-total: | 386 | 295 | 76 | 64 | 17 | 27 | 7 |
| III. Central | | | | | | | |
| 6. Mudug | 215 | 170 | 79 | 22 | 15 | 13 | 6 |
| 7. Galgudud | 182 | 119 | 66 | 24 | 19 | 19 | 10 |
| Sub-total: | 397 | 289 | 73 | 26 | 19 | 32 | 8 |
| IV. Shebelli River | | | | | | | |
| 8. Hiran | 147 | 116 | 79 | 22 | 15 | 9 | 6 |
| 9. Middle Shebelli | 263 | 166 | 63 | 68 | 26 | 29 | 11 |
| 10. Lower Shebelli | 398 | 193 | 48 | 143 | 36 | 62 | 16 |
| 11. Benadir | 380 | - | - | - | - | 380 | 100 |
| Sub-total: | 1,188 | 475 | 40 | 233 | 20 | 480 | 40 |
| V. Juba River | | | | | | | |
| 12. Gedo | 212 | 181 | 85 | 22 | 10 | 9 | 4 |
| 13. Middle Juba | 216 | 141 | 63 | 52 | 24 | 23 | 11 |
| 14. Lower Juba | 223 | 155 | 70 | 48 | 22 | 20 | 9 |
| Sub-total: | 651 | 477 | 73 | 122 | 19 | 51 | 8 |
| VI. Inter-Riverine | | | | | | | |
| 15. Bakool | 100 | 79 | 79 | 15 | 15 | 6 | 6 |
| 16. Bay | 302 | 100 | 33 | 141 | 47 | 61 | 20 |
| Sub-total: | 402 | 179 | 45 | 156 | 39 | 67 | 17 |
| TOTAL: | 3,722 | 2,184 | 59 | 811 | 22 | 727 | 20 |

SOMALIA

AGRICULTURAL SECTOR REVIEW

Estimated Average Number of Livestock Per Agricultural Household,
by Region, 1975

| <u>Region</u> | <u>Camels</u> | <u>Cattle</u> | <u>Sheep & Goats</u> | <u>Total Livestock Units</u> |
|--|-------------------|-------------------|------------------------------|--------------------------------------|
| I. <u>North-West</u> | | | | |
| 1. W Galbeed | 7.8 | 1.9 | 68.2 | 16.1 |
| 2. Togdheer | <u>6.7</u> | <u>0.9</u> | <u>37.8</u> | <u>11.2</u> |
| Sub-total: | 7.3 | 1.5 | 56.6 | 14.2 |
| II. <u>North-East</u> | | | | |
| 3. Sanaag | 7.6 | 2.7 | 80.9 | 17.9 |
| 4. Bari | 8.3 | 0.6 | 120.1 | 20.8 |
| 5. Nugal | <u>9.7</u> | <u>0.8</u> | <u>52.1</u> | <u>15.6</u> |
| Sub-total: | 8.3 | 1.4 | 90.3 | 18.6 |
| III. <u>Central</u> | | | | |
| 6. Mudug | 18.8 | 8.5 | 97.0 | 35.3 |
| 7. Galgudud | <u>11.3</u> | <u>6.2</u> | <u>66.3</u> | <u>22.9</u> |
| Sub-total: | 15.7 | 7.6 | 85.0 | 30.3 |
| IV. <u>Shebelli River</u> | | | | |
| 8. Hiran | 16.5 | 6.1 | 51.6 | 26.5 |
| 9. Middle Shebelli | 5.0 | 7.8 | 22.2 | 13.5 |
| 10. Lower Shebelli | 4.4 | 6.3 | 4.3 | 9.9 |
| 11. Benadir | - | - | - | - |
| Sub-total: | <u>7.0</u> | <u>6.9</u> | <u>19.8</u> | <u>14.5</u> |
| V. <u>Juba River</u> | | | | |
| 12. Gedo | 19.1 | 12.9 | 30.0 | 32.4 |
| 13. Juba (Before separation into two regions) | 3.7 | 12.9 | 3.2 | 14.3 |
| Sub-total: | <u>8.9</u> | <u>12.9</u> | <u>12.5</u> | <u>20.5</u> |
| VI. <u>Inter - Riverine</u> | | | | |
| 14. Bakool | 10.1 | 5.3 | 17.3 | 16.1 |
| 15. Bay | <u>7.5</u> | <u>5.3</u> | <u>5.6</u> | <u>12.3</u> |
| Sub-total: | 8.3 | 5.3 | 9.0 | 13.4 |
| TOTAL: | <u><u>8.9</u></u> | <u><u>5.3</u></u> | <u><u>41.3</u></u> | <u><u>17.3</u></u> |

Notes: 1. Source: Table 19-4 of 1979-1981, Three Year Development Program. Revised Draft.
2. Livestock units calculated on the basis of FAO norms: Cattle = .8; Camel = 1; Sheep and Goats = .1.

SOMALIA

AGRICULTURAL SECTOR REVIEW

Farm Size, Labor and Returns

(Summary table to come)

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Earnings Differentials in Government Employment

| Reference Group | Average Gross Monthly Earnings (Lira) | Coefficient of Differentials in Earnings |
|--|---------------------------------------|--|
| 1) <u>Messenger</u> (Grade 5 on the "D" Scale) | <u>220</u> | 1.0 |
| 2) <u>Clerical and Technical Staff</u> (Grade 2 on the "C" Scale) | <u>660</u> | 3.0 |
| 3) <u>Executive & Senior Technical Staff</u> (Grade 1 on the "B" Scale) | <u>1,030</u> | 4.7 |
| 4) <u>Top Administrative & Professional Staff</u> | | |
| a) Middle Ranking Senior Administrator (A-4) | <u>1,160</u> | 5.3 |
| b) Director of Department (A-3) | <u>1,950¹</u> | 9.0 |
| c) Director General of a Ministry (A-2) | <u>2,500¹</u> | 11.0 |
| d) Minister | <u>5,000¹</u> | 23.0 |

1/ After accounting for all allowances such as housing and responsibility allowances.

Source: Computed from the salary scale attached to the Civil Service Law. From ILO/JASPA, p. 339.

Annex:
Table: 5b

Earnings Differentials in SNAI Sugar Factory, 1976

| Occupational Group | Average Gross Monthly Earnings | Coefficient of Differentials in Earnings |
|--|--------------------------------|--|
| 1) Unskilled Labourer in Plantations | 200 | 1.0 |
| 2) Unskilled Labourer in the Factory | 315 | 1.6 |
| 3) Semi-Skilled Labourer in the Factory and in the Field | 600 | 3.0 |
| 4) <u>Skilled Artisans</u> | | |
| Electrician | 690 | 3.4 |
| Mechanic | 780 | 3.9 |
| Pan-Boiler | 815 | 4.0 |
| Refiner | 510 | 2.9 |
| 5) <u>Technicians</u> | | |
| Engineer | 2,350 | 12.0 |
| Agronomist | 1,575 | 8.0 |
| 6) <u>Administrative and Senior Clerical Staff</u> | | |
| Accounting Officer | 795 | 4.0 |
| Middle Grade Clerk | 693 | 3.5 |
| Low grade Clerk | 635 | 3.2 |
| 7) <u>Managerial Staff</u> | | |
| Head of Services | 1,650 | 8.3 |
| Director of a Department | 2,675 | 13.4 |
| General Manager | 3,900 | 19.5 |

Source: From ILO/JASPA, p. 330.
Data supplied by the SNAI Sugar Factory - JOWHAR.

Project Contribution to Specific Objectives 1985

| Policy and Project | Self-sufficiency in food and raw materials | | Balance of payments | | Use for industry and services | | Distribution, Justice & basic needs | | Growth of GNP | | Control of the economy | | Government revenue base | | Cost benefits | | Training | |
|--|--|---|---------------------|---|-------------------------------|---|-------------------------------------|---|---------------|---|------------------------|---|-------------------------|---|---------------|---|----------|---|
| | * | 2 | ** | 2 | *** | 4 | *** | 5 | * | 2 | ** | 3 | ** | 5 | ** | 4 | *** | 2 |
| <u>Improving existing agricultural</u> | | | | | | | | | | | | | | | | | | |
| (1) <u>Traditional</u> | | | | | | | | | | | | | | | | | | |
| Cooperatives | * | 2 | | | | | *** | 5 | | | ** | 3 | | | | | *** | 2 |
| N.W. Agricultural Dev. Project | *** | 2 | ** | 2 | | | ** | 3 | *** | 3 | | | | | ** | 4 | | |
| Fixed price and markets | * | 3 | | 2 | | | ** | 4 | | 1 | | 2 | | | | 1 | | |
| (11) <u>Modern</u> | | | | | | | | | | | | | | | | | | |
| Sugar and Banana | | | *** | 4 | *** | 4 | | | *** | 4 | * | 3 | ** | 5 | ** | 4 | * | 2 |
| Grapefruit seedlings | | | ** | 5 | * | 3 | | | *** | 4 | * | | * | 4 | ** | 5 | | |
| Water command (Johar & Kurlere) | | | * | 5 | | 2 | * | 2 | | 4 | | | | 3 | | 3 | | |
| Water command (Johar & Kurlere) | | | *** | 3 | ** | | | | *** | 5 | | | | | *** | 5 | | |
| <u>Extending irrigated area</u> | | | | | | | | | | | | | | | | | | |
| (1) <u>Emphasis on foodstuffs</u> | | | | | | | | | | | | | | | | | | |
| Kurlere & Yente | * | 1 | | 1 | | | | 2 | | | * | | | | | | | |
| Fazole II | * | | | | | | | 2 | | | * | | | | | | | |
| Kurun-Waray & Sablale | *** | 4 | * | 3 | | | *** | 5 | | | * | 3 | | | | | *** | 4 |
| Atter-Mardinle & Islad | *** | 5 | * | 5 | * | 2 | | | * | 4 | * | 5 | | 4 | ** | 5 | * | |
| (11) <u>Emphasis on cash crops</u> | | | | | | | | | | | | | | | | | | |
| Juba Sugar I & II | | | ** | 4 | *** | 5 | | | *** | 5 | ** | 5 | ** | 5 | * | 4 | * | 2 |
| Erlonji & Golwein | | | *** | 5 | * | 3 | | | ** | 4 | * | 4 | ** | 5 | ** | 4 | * | 2 |
| Fazole I | * | 1 | ** | 4 | ** | 4 | | | ** | 4 | * | 4 | * | 4 | ** | 3 | | |
| Gazole-Bulo Murerta | *** | 3 | *** | 3 | *** | 3 | ** | 2 | *** | 5 | | 1 | * | 2 | *** | 4 | | |
| (111) <u>Reliance of food & cash crops</u> | | | | | | | | | | | | | | | | | | |
| Rural | *** | 4 | * | 4 | * | 2 | *** | 5 | * | 1 | * | 4 | | 1 | | 1 | *** | 4 |
| Cocoa programme (indirectly) | * | 4 | * | 2 | * | | ** | 5 | * | 2 | * | 3 | * | | | | *** | 4 |

1. Stars indicate emphasis within project - read across the row
2. High numbers indicate contribution/the policy - read down the column but note variations in project size.

Source: ILO/JASPA, p. 68.

Annex:
Table: 6