Flood-Irrigated Agriculture in Kassala Area and the Possibility of Rehabilitating the Kalahut Agricultural Project

Executive Summary

A mission from Environment and Development Services (EDS) was fielded by PLAN INTERNATIONAL (SUDAN) to study the Flood –Irrigated Agriculture in Kassala area. The mission was also asked to investigate the possibility of the rehabilitation of Kalahut Project.

The mission traveled to Kassala on March 15 and stayed there for 10 days during which it visited over 20 of the villages where PLAN has some interventions. The villages visited were restricted to Kassala and Gash Provinces.

The approach adopted by the mission involved:
1. Interviews with key government officials,
2. Interviews with farmers and other beneficiaries especially PLAN families,
3. Accessing previous reports on agricultural development in the area,
4. Field observations.

Kassala State lies between latitudes 14° 45′ and 17° 15′ north, and 34° 40′ and 37° 00′ east. It has 5 Provinces covering an area of 42330 km^2. The study area is limited to Kassala Province (4030 km^2), and Gash Province (14210 km^2).The population of the State is about 1 234 562 according to the 1993 census.

The study area lies within the arid and semi-arid zone with the following characteristics:
1. Annual rainfall ranges between 172 – 314 mm,
2. Mean temperature around 40 C,
3. Relative humidity 72 % in August and 17% in April,
5. Evaporation averages 7.95mm/day or 2976mm/year i.e. 7 times the amount of annual rainfall,
6. Evapotranspiration is 800-2600mm/year in the area occupied by orchards, 600mm/ year in the Delta and 100 mm/year in the desert.

Kassala State incorporates 5 vegetation zones namely:
1. *Commiphora africana* community
2. Semi-desert scrub and grassland community on sandy soils
3. Arid grassland on clay soils
4. *Acacia mellifera* community
5. *Gash Delta* plant community

Rangelands in the study area can be divided into:
a. Natural range at Atbara and Sitait Rivers, the Gash Die and the eastern khors
b. Summer flood-irrigated ranges e.g. flooded land for cultivation purposes, flooded lands outside the rotation, the Ballack lands and lands under forest inside the Delta.

and diseases, lack of efficient methods for water harvesting, lack of early maturing varieties, inadequate research and extension services and finance.

The Shukria system is a form of mechanized farming. They grow sorghum and sesame. They also keep livestock especially sheep and camels. The size of land owned is large ranging beteen1000-2000 feddans. Most farmers own their own tractors. Some small farmers are also present. The size of their land is 100-200 feddans. They hire tractors and threshers to perform the various cultural operations. The main problems facing the Shukria farmers are unavailability of water at time of harvest, crop failure during years of low rainfall, low prices during years of good crop harvest, marketing, lack of liquid money to perform the various farm operations, little or no utilization of crop residues, government taxes and pests and diseases.

The Rashaida system is dominated by livestock especially camels and sheep. Limited cropping is practiced under the terrace system of cultivation. Efficient water harvesting techniques, early maturing varieties and extension are needed.

Livestock are an integral part of the various farming systems in the study area. The local Hadendawa people depend on livestock for their diet (milk and meat). They also sell surplus animals to earn cash to meet various needs of the household. Livestock are reared mainly on natural ranges. Crop residues and concentrates are also important livestock feed.

The number of livestock in Kassala State amounts to 3.3 million heads. Of these about 38% (1.25 millions) are found in Kassala and Gash Provinces. Animal species raised are cattle, sheep, goats and camels. Donkeys and poultry are also raised.

Cattle types raised in the study area are the Gash, Kenana and Butana. A promising sub-type of the Gash, known as Airashai, is reputed for its high milk yield and docility. The prevailing sheep breeds are Kenana and the Desert sheep of Western Sudan. Two goat breeds are dominating: the Nubian goat famous for its high milk yield and the Taggar goat reputed for its high prolificacy and tolerance to harsh environmental conditions. Two donkey breeds can be identified, a riding and a pack animal. Horses are restricted to big towns and their main use is in pulling carts. Camel breeds are also divided into riding and pack animals.

Livestock ownership varies from 1-50 heads/household. Field data shows that the average holding is 3 cattle, 5 sheep, 8 goats, 0.6 camels and 1 donkey. Herd composition data shows that for cattle 28% are milking animals, 15% are dry females, 10% mature males,25% young females and 22% young males. For sheep 22% are lactating, 11% dry females, 10% mature males, 30% young females and 27% young males. About 15% of the goats are milking, 25% dry females, 15% mature males, 25% young females, and 20% young males. For camels 15% are milking females, 25% dry females, 15% mature males, 25% young females and 20% young males.

Annual livestock off-take is 12%, 18%, 22%, and 8% for cattle, sheep, goats and camels respectively. This is much lower than the national average of 25-30% for cattle, 30-35% for sheep and goats and 18% for camels. Based on these off-take figures the number of animals available for sale is estimated at 62 000 heads of cattle, 219 000 heads of sheep, 217 000 heads of goats and 43 000 heads of camels.

The household consumption of meat in urban centers is estimated at 0.25-0.50 kg/day for 300 days a year. In rural areas consumption is estimated at 1.5-3.0 kg/week. On the other hand poor households consume about 1.0 kg of cheap meat every week. Based on these assumptions the total meat consumption in the study area is estimated at 466 tons which gives a daily per capita consumption of 46g, much less than the national average of 85g. The marketing channels of live animals, meat and hides are described in the main report.

Annual milk production in the study area was estimated at 60 284 000 lb. or 165 162 lb./day. About 84% of the milk produced came from cattle, 10% from goats, 2% from sheep and 4% from camels. Daily milk consumption was estimated at 118 715 lb. This gives a production: consumption ratio of 72% meaning a surplus of 28% available for the market. Milk marketing channels were described in the main report. The cost of production of 1 lb. of milk was estimated at SL236. The sale price at the same time was SL400 giving a net profit of SL164

The main problems facing livestock production in the study area are:

1. Lack of integration between livestock and crop production.
2. The agricultural rotation includes no forage crops despite their technical and economic feasibility.
3. Expansion in mechanized farming led to the concentration of livestock in limited areas resulting in range degradation.
4. Finance
5. Marketing
6. Processing of livestock products and livestock feeds
7. Animal breeds

The mission proposed a non-government administrative council to be entrusted with the development of the livestock industry. This council will set the stage for and assist in the establishment of marketing and other services such as:

1. Milk collection
2. Setting specifications for saleable milk
3. Establishment of small units for the production of evaporated milk
4. Processing of surplus milk
5. Grouping and organizing producers
6. Laying down pricing policies serving the interests of both producers and consumers
7. Protection of range lands
8. Facilitate feed acquisition
9. Training of producers in marketing and other related areas
10. Provision of collateral for group financing
11. Disease control and provision of veterinary services.

The socio-economic status of women in the study area was given due consideration. Women development is constrained by deep- rooted traditions that vary among tribes. The basic task of women is, however, child care and food preparation for the household. Differences in the role of women are also noted between urban and rural areas. In the latter case women are involved in agricultural production especially among the Fulani, Borno and Hawsa tribes. In contrast women involvement in agriculture diminishes among the Hadendawa and Beni Amir tribes and is almost

completely lacking among the Rashaida and Shukria. However, the recent economic and environmental changes forced some women from these tribes to perform some economic activities.

Field data collected by the mission indicated women involvement in a number of tasks either alone or jointly with other members of the family. Most important of these are weeding, dura harvesting, vegetable production, goat and poultry keeping, and fetching water and fire- wood. They are also involved to a less extent in sowing, cattle and sheep management, vegetable processing and marketing, and other income generating activities such as cheese making and hand crafts.

In general, education among women is very limited compared with men. A large number of girls leave school early to get married at the age of 12-13 years. Illiteracy among women stands high at 87%. Health care for women is far from adequate. Malaria, malnutrition and infectious diseases are common. Child care and mid-wife services are weak or absent in many areas. The mission proposed a number of recommendations to promote women development. These include plans and programs to incorporate women in the mainstream of development, enhancing community education, enabling women to have access to credit and other production requirements. Establishing multi-purpose community centers in order to raise the awareness of women and empowering them was also proposed.

Financing is a key factor limiting development in the study area. The policies of the Bank of Sudan for the period 1999-2002 were adequately described. These were:
1. A reduction in the cost of financing,
2) Support to producing families and poor sectors of the community,
3) Shifting gradually from *Murabaha* forms of finance to *Musharaka*.
4) Priority in financing goes to agricultural production, export commodities and industry,
5) A reduction in interest rate to 20% and,
6) A reduction in the amount of advanced payment down to 25% of the loan.

These policies should favorably affect the sector targeted with finance though they may negatively impact on the lending institutions. The major lending institutions in the study area were enumerated. Activities given priority for lending for each were indicated. These included livestock rearing, seasonal vegetable growing, orchard farming, feed industry, oil pressers, cheese making, trade, steel crafts and spare parts, brick making, flour mills, carts and other means of transport, livestock trade and soap industry.

As per TOR the mission should consider the possibility of establishing cooperative societies as a suitable mechanism for provision of agricultural services. The experiences of the agricultural cooperative societies were, therefore, reviewed. The advantages and disadvantages of grouping small farmers into independent organizations were compared and a proposal for the establishment of new cooperatives was put forward.

Priority areas where cooperative efforts are needed, as gathered from field interviews with farmers, are:

1. Possession of agricultural machinery such as tractors, ploughs and harvesters.
2. Provision of agricultural inputs e.g. improved seeds, fertilizers and pesticides.
3. Lending and saving facilities.
4. Marketing of the produce.

Threats to a successful cooperative work are lack of awareness of group management, selection of cooperative leadership, selection of cooperative members and financing. To resolve the latter issue a consortium of banks and other lending institutions was proposed to provide loans with favorable terms to small farmers' groups or cooperatives. It was also suggested that an agricultural insurance system should be introduced.

Training was emphasized as the driving force for any successful work with farmers. It should involve farmers' leaders, farmers and agricultural officers.

Some interventions were proposed, as examples, to improve the efficiency of the production systems. An intervention was proposed only after the farming system was defined and its constraints defined. Interventions were proposed following the description of the farming systems and the identification of their constraints. The intervention should meet the following criteria:

1. It should address the constraints identified.
2. It should be environmentally sound.
3. It should take into consideration the integration between crops and livestock.
4. It should be transparent to the issue of conservation of local genetic resources

The interventions are under 4 programs and 6 projects namely:

1. Increasing the efficiency of flood-irrigated agriculture. This programs contains 3 projects:
   a) diversification of crops
   b) fallow farming and sheep production
   c) forestry farming
2. Improvement of local goats
3. Milk production
4. Increasing the income of Shukria farmers through an integrated approach to agricultural production

Finally the report dealt with the rehabilitation of the Kalahut Agricultural Project. The present status of the project was described. Two phases were proposed for the rehabilitation. The first phase involves detailed studies of the rehabilitation works such as drawings, estimates and tables of quantities. The second phase deals with the execution of the works detailed in the first phase. A budget amounting to 5.7 million Dinars was proposed.

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