

The International Fund for Agricultural Development
Near East and North Africa Division
Project Management Department

REPUBLIC OF THE SUDAN

GASH SUSTAINABLE LIVELIHOODS
REGENERATION PROJECT

Target Group and Project Description
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I. TARGET GROUPS AND PROJECT AREA

A. Target Group

Location and Population

1. GSLRP is located in Kassala State, in Eastern Sudan. With two important water resources such as the Atbara River that irrigates the New Halfa Irrigation Scheme¹, and the seasonal Gash River captured through flood control, Kassala State serves as a refuge area at times of crisis. Drought and civil unrest have drawn internally displaced people and refugees to settle in Kassala thus increasing demographic and economic pressure on a well endowed but fragile resource base. Today, it is estimated that Kassala State hosts 20% of the refugee population in Sudan. As such, it is an important target area for relief programmes and food aid. In the Gash area, the population is estimated to have increased sevenfold over the past 20 years; tenants have increased fourfold in the Gash scheme, whereas the production base – the cultivated area – has decreased by 50%.

2. **Population.** The population consists of an estimated 87 000 households comprising around 480 000 people. Their communities are essentially rural; small townships are focused on Gash flood plain and along the main road to Port Sudan. The Hadendowa, the largest of the Beja ethnic group, is the major tribe and have traditional land rights. The tribe consists of semi-nomadic pastoralists who rely on agriculture as a limited secondary activity to provide staple grain at subsistence level. Other ethnic groups include pastoralists and sedentary agriculturalists and horticulturalists. There are an estimated 180 villages, which range in size from less than 100 to more than 250 households, and numerous semi-sedentary camps. The main towns are Aroma and Wagar with about 8 and 11 thousand people², respectively.

Poverty and Gender Situation

3. The majority of the people in the Project area are poor. Living in larger villages of mud brick housing and in smaller settlements of traditional tenting, they are dependent on subsistence farming of very small holdings allocated according to rainfall or floods, sharecropping, a few livestock, casual labour, firewood collection and sale, as well as charcoal making and marketing.

4. **Indicators of poverty.** A Multiple Index Cluster Survey by UNICEF in 2000 indicated that Kassala State is among the poorest in Sudan when ranked on the basis of maternal and child health, nutrition, and child education. Malnutrition, tuberculosis and malaria are rampant. The under five moderate wasting rate is estimated at 12.3% and the severe wasting rate is estimated at 4.7 %. The rate of live births weight below 2.5 kg is 25.4% and serves as a proxy indicator for women's malnutrition. Of children aged 0-29 months, 24.6% fall ill with malaria. Infant and child mortality rates are 1.5 times the average for Sudan. There are 101 infant deaths for 1 000 live births, and 172 deaths of children under 5 years per 1 000 live births.

5. A recent needs assessment conducted for UNICEF's Child Friendly Communities programme showed localities in the Project area to be among the poorest in terms of social development indicators. In the Project area, the average cultivated land of one feddan per tenant and the ownership of 1-10 head of small livestock are insufficient for the food security of households whose size is estimated at 5.5 persons.

¹ From 1980 to 1988, IFAD co-financed the New Halfa Irrigation Rehabilitation Project, located approximately 150 km to the West of GSLRP.

² Prior to the collapse of GAS, the urban population in Aroma was of the order of 50 000 people.

6. **Poverty Ranking.** A major reason for poverty in the Project area relates to the institutional degradation of the Gash Scheme. This has resulted in the following: (i) mismanagement of resources including decrease in delivery of water, abolishment of cash crop production and collapse of the marketing structure of the cash crop; (ii) loss of cash crop undermined the revenue base of the Scheme and hence further loss of capacity to provide irrigation and agricultural services; (iii) the Scheme management lost its autonomy after it changed hands from the private sector to the public sector and in one account the government put its hands on the financial reserves of the Scheme (iv) unsolicited interventions from the part of government on land allocation.

7. With respect to household level poverty ranking in the Project area, there are three main categories; and people shift from one category to the next. Firstly, the poorest are not registered on the irrigation scheme and sharecrop very little or no land and may comprise some 20 000 households. They have no livestock, and are fully dependent on cash earnings from casual labour on farms or in local villages or towns, and by cutting and selling firewood and manufacturing of charcoal. Among the poorest are around 4 500 women-headed households, which are not included in the irrigation scheme. In this case, contrary to Hadendowa social codes, female heads of households are increasingly involved in crop harvesting and handicrafts, for which they are either paid in cash or in-kind.

8. Secondly, there are about 17 000 households who either do not have land in the irrigation scheme registered in their name or, if they do have, have not had an allocation for the year under the lottery system. Many of these get small areas (less than one half feddan) on which they grow sorghum, on 50% produce share-crop basis. This is insufficient to satisfy the household's staple grain needs, although they may have a few small ruminants and in some cases a cow. A large proportion of their income is derived from firewood collection and charcoal production and from seasonal casual labour, both locally and outside of the area. There are also some 3 000 households of West African origin or who have emigrated from other parts of Sudan and who live under the same economic conditions in GAS, but they tend to be less poor. Some 50% of these households are concentrated in Kassala block. In these non-Hadendowa households, women also generate income as seasonal agricultural labourers. They are generally located in the southern part of the irrigation scheme near commercial horticultural holdings and orchards.

9. Thirdly, an estimated 20 000 who cultivate one feddan registered in their name or sharecrop more than two feddans. They have up to two of cattle and 10 small ruminants. Similar to the majority of the poor, the women stay at home; men supplement their income by casual labour in towns and, if they are getting poorer, engage in firewood collection and charcoal manufacture on a part-time basis.

10. To be above the poverty line, people have to cultivate more than one feddan registered in their name on the scheme, have more than five cattle, and over a dozen small ruminants. They may also have a male family member employed in town either on a regular or casual basis. The household women stay at home and are busy with domestic activities ranging from manufacture of tents and other household goods to childcare. This group usually includes the leaders of the smaller settlements, who are rarely significantly richer than their co-villagers. There may be up to 10 000 such households.

11. There is also about 5 000 wealthy people, who have access to more than 10 feddan, and large herds of livestock which may be far away from the area at different times of year. They also have regular income from owning shops or larger scale trading and other activities. They include civil servants, the main Hadendowa leaders as well as leaders of the larger villages.

12. **Causes of Poverty.** At the household level the dynamics of impoverishment and enrichment are related to the following factors: access to land, livestock numbers and their overall condition, the stages of household development, the number of dependent children and adults, as well as vulnerability to disease and other life cycle crises. Death of a working husband or divorce is a major cause of impoverishment for households. The women headed households established in this way tend to be the poorest, due to the fact that they lack the main male income earner. In non-Hadendowa

families, women can work as agricultural labourers and in other activities without any loss of status. In the case of Hadendowa women, household heads and the poorest are forced out of the home to work, though in the context of their culture, this lowers their status and is a particularly undesirable situation.

13. Some households which are primarily dependent on cultivating land on the scheme are impoverished on a cyclical basis, as they are poorest in the years when they have no or less land allocated, while their standard of living is better when they have irrigated land.

14. Livestock disease and death are a major cause of impoverishment for households. Government veterinary services are weak and recurrent drought and resulting feed shortages contributes to livestock attrition. The most obvious case is the major drought of the early 1980s which is still quoted daily by the people of the area. At that time, the vast majority of livestock perished, and this marked the moment when the Hadendowa changed over from being primarily livestock herders to considering crop production as important as livestock.

15. **Coping Strategies and Solidarity Mechanisms.** Most of the coping strategies to address impoverishment are individual and household based. The main community mechanism among the Hadendowa is the *sagadeeb*, a mechanism according to which poor members of the group receive grain or livestock for subsistence, from the sheikh or from other members of the group. The *sagadeeb* system provides some of the poor with basic necessities sufficient to guarantee their survival, rather than providing them with access to productive assets which would enable them to become self-reliant and overcome their poverty. Most importantly it is a mechanism which on the one hand ensures sustained dependence of the poor on the tribal leaders, and thus encourages their loyalty and on the other hand prevents them from developing their own economic independence. The land allocation system of GAS in the past has strengthened this social structure through the allocation of large areas of irrigated land to sheikhs, leaving them to manage it in whichever ways they decided might be best to benefit the poor. Hence their power has been increased at the expense of household level economic self-sufficiency and autonomy.

16. Access to food aid has become a major coping strategy for the people of the Project area. There is great demand and expectation of food aid and this is an important input for the poorest families.

17. **Gender Situation.** The Hadendowa tribe being the most important in population size on the Gash Delta has been the focus of numerous gender studies. Women's involvement in productive activities reflects the tribe's pastoralist nature and an adaptation to a life of confinement. While they make all items used for home making, they have no other activities. Illiteracy is a major problem and most do not speak Arabic. Women used to process milk into butter and sour milk, and older women used to market the products; however both these activities have more or less disappeared due to the absence of surplus milk. In recent years, under the influence of NGOs and other external support, women have started to raise a few poultry and produce eggs for the market; although the Hadendowa still do not consume these products much.

18. According to Islamic law, women inherit land. However, most women forego their inheritance rights in favour of their brothers, and are often excluded from the land distribution and allocation. This practice is based on reciprocity: the brother provides protection to his sister; in exchange, the sister foregoes her inheritance rights. This system of reciprocity reaches its limits in times of livelihood stress and land scarcity, when the brother can no longer guarantee the subsistence and security of his sister. As no women are registered on the books as landholders, it is not surprising to find that women are not members in any of the farming organizations.

19. With increased poverty, women are developing alternative coping mechanisms. Women participate in savings groups, *sandug*, for consumption purposes and engage in home based income generating activities such as mat making and poultry rearing. In the poorest households, economically active women are reported to contribute up to 50% of household income. However, household income

still falls below subsistence levels, leading to reliance on external aid. Only the poorest Hadendowa women have any activities outside the home; when economic necessity is pressing, these women may work as wage labourers in agriculture locally, primarily in harvesting and, to a lesser extent, in weeding.

20. There is a marked difference between the life style of the Hadendowa women and that of women from other social groups in the area. For example, women from West African groups are fully involved in economic activities, working in agriculture as labourers in the well irrigated enterprises and elsewhere, having micro-enterprises in food processing and marketing, making handicrafts and selling them and also being involved in livestock husbandry.

Stakeholders and Target Group

21. The stakeholders in the target group universe will be:

- (a) Policy-makers, including MOAF and MOIWR.
- (b) National Financiers, in particular MOFNE.
- (c) Other Government resource administrators, such as GAS, the State MAAWI and other line ministries, and Local Councils.
- (d) Traditional leadership that controls land allocation, in particular the Nazir of the Hadendowa and the tribal sheikhs;
- (e) Tenants of GAS who have inherited entitlement (*rabt*) to wetland.
- (f) Non-Hadendowa tenants who have been allocated new land tenancy rights or who have gained a seasonal or permanent access to wetland, namely merchants and horticulturists.
- (g) People who have been excluded from the traditional *rabt* but benefit from *sagadeeb*, including women – and widows – and destitute households.
- (h) Casual beneficiaries from the deterioration of the irrigation system, namely the herders and the charcoal makers;
- (i) Recent migrants or internally displaced people from Hadendowa clans in Hamaish Koraib Locality who have settled in the Gash delta with the concurrence of the Central Government, and whose residence situation and claim on the land is unclear.
- (j) Non-agricultural residents, such as the traders and Government officials and staff, who will stand to benefit from the regeneration of livelihoods in the Project area.

22. Out of an estimated population of 480 000 people in 87 000 households, most of the rural population encompassing some 369 000 people or 67 000 households will form the Project's primary target group, of which 40 000 households will be accommodated on the irrigation scheme and 27 000 provided with Project benefits through livestock activities and off-farm enterprise.

(a) Project Area

23. The Project area has been determined by an assessment of the livelihood strategies³ of the target population that inter-relate the resources of the Gash scheme and those of the rangelands surrounding it. It has been defined to be small and primarily inhabited by poor households dependent on agricultural production, and encompasses the entire locality of Gash, as well as parts of Hamaish Koraib and Kassala localities (See Map 2). It includes the entire command area of the Gash scheme, as well as the east bank of the Gash River and the range lands north and west of the scheme; but excludes Kassala city to the South and its surrounding villages.

³ IFAD fielded a Livelihoods and Poverty Assessment mission, financed by the DfID, to the Project area between 11 November and 2 December 2002. A Population Survey was undertaken in March 2003.

Physical Features

24. **Topography, Soils and Vegetation.** The Project area is dominated by the Gash River and its terminal fan. The landform is flat with an average slope of 0.1%, with isolated rocky outcrops (*jebels*) to the east and in the north rising to the Red Hills. The dominant soils on the Gash flood plain are Fluvisols, highly productive silt, silty loam and loamy sand deposits. They are inter-dispersed with Vertisols that occur more frequently in the north of the flood plain and in the terminal fan. Because their infiltration rates are moderate to slow they are not as suitable as the Fluvisols for crop production under flush irrigation.

25. In the north and west where the rainfall is lower the vegetative cover is poor and includes scattered acacia trees and short grasses and shrubs. On the clay soils in the northern reach of the Gash flood plain and the terminal fan where the water table is shallow, the vegetation is denser and a significant area is covered with semi-evergreen woodland. Mesquite (*Prosopis chilensis*)⁴ has become an aggressive invasive shrub along the Gash riverbanks and over flood plain on areas that are public lands or under-utilised, especially on well drained soils where its root system can reach the water table. Because of its extensive root system it also provides a degree of stabilization where it has colonised the river bank levees. Although it is the major weed pest of the irrigated lands, the shrub has become the economic base of the charcoal industry and provides one of the few sources of cash income, particularly for non-tenants and sharecroppers.

26. **Climate.** The climate is semi-arid to arid. It is hot throughout the year with maximum temperatures ranging from 42°C in May to 34°C in August. Minimum temperatures range from 25°C in May to 16°C in January-February. The average annual rainfall ranges from 260 mm in the southeast to less than 100 mm in the northwest. It is highly seasonal, occurring between July and October, and is extremely variable in amount, intensity and distribution. The effectiveness of the rainfall is severely limited by high evapo-transpiration rates ($\geq 2\ 000$ mm per year) and it commonly fails to penetrate to the depth of the root zone. This means that the rainfed median effective growing season is from less than 30 days to 60 days which presents a harsh environment for the main staples of sorghum and millet. Droughts are frequent, can be prolonged and present a serious restriction on agriculture, which consequently relies on irrigation.

27. **Water Resources.** The principal water resource is the Gash River which rises in the Ethiopian highlands. It is ephemeral, meanders because its grade is low, responds rapidly to storm rainfall in the catchment area and is characterized by intense flood flows extending over an effective period of 60-70 days from July to September with high sand and silt loads. Downstream from Kassala town its flood waters are used to irrigate the Gash Agricultural Scheme, before dissipating in the terminal fan some 100 km north of Kassala town where it provides moisture for natural forests, pasture and seasonal wetlands crop production. It also recharges the aquifers, which support stock water points.

28. Recharge comes directly from infiltration from the Gash River during floods and from percolation of overland flow from the Gash Scheme. The depth of the upper (shallow) aquifers in the Gash basin ranges between 6 m and 30 m; they are underlain by thick sediments. Along the river in Kassala area and on the flood plain the aquifers are being exploited by pumping from shallow wells for horticulture, and are the principal source of water for human consumption. The shallow aquifer in the Gash Die is also a major source of water for livestock.

29. In the west of the Project area, hafirs⁵ and hods⁶ are used for water storage. They are recharged from either outflow from irrigation canals where they are adjacent to the Gash Scheme or from rainfall

⁴ Mesquite was originally planted in GAS in a pilot programme for stabilizing canal banks. Its spread to a large degree reflects poor scheme management and deterioration in the infrastructure which has reduced the area which can be irrigated. Mesquite will be cleared from the scheme and replaced in public areas by other tree species, which may be used for timber and charcoal production.

⁵ Earth walled reservoir usually located on a depression to collect overland flow.

runoff. Because of the high potential evapo-transpiration and seepage they only hold water for a limited period in the dry season. While this may indicate that utilization of the range for livestock production is water limited, it may not be the case in practice. Rather the availability of surface water may be in harmony with the range resource.

Land Tenure and Land Use

30. Traditional land rights have been to a large degree recognised. Within the Gash irrigation scheme Hadendowa tribal clans are allotted 75% of the land while the 25% of the land is allotted to other groups such as investors, horticulturists and Government and Irrigation Scheme employees. Farmers do not have tenancies on a permanent portion of land but move from one site to another within each clan's irrigation block on a lottery basis as a fair system for equitable access to wetland to ensure the best opportunity to gain irrigation water for crop production. However, the system is skewed towards the more affluent, as those who first pay the initial instalment of water fees are given priority in the allocation of wetland.

31. The allocation of land has been under severe stress since the extended drought in the mid-1980s. While the irrigation scheme was originally designed for 12 000 tenants, the number of tenants has increased considerably: from 22 000, in 1988; 32 000, in 1992; 42 000, 1998; to 45 000, in 2002. As well, there is pressure from the additional demand for land by some 47 000 households that have migrated to the Gash Die, north of the scheme.

32. As a consequence, the present average tenancy is less than one feddan. Because of restrictions on the supply of irrigation water only 10% of this allotted area can be farmed which is insufficient to provide household food security. This is exacerbated by the inequitable distribution of land where 60% of the land is held by 3% of the farmers, namely the tribal leaders who also control 200-300 feddans in each block to provide food for the poorest, and investors who may hold up to 100 feddans. In general, this land is commonly worked by wage labour or through share-cropping arrangements.

Farming Systems

33. **Nomadic Pastoralism.** The loss of animals during the droughts of the mid-1980s has caused a shift towards agro-pastoralism. Pure pastoralism, including the migration of the entire household with their animals, is no longer generally practised by the Hadendowa. Rather they are establishing their camps on the Gash flood plain, around urban areas and centres where emergency food supplies may be obtained. Male members travel with the livestock while the rest of the family remain behind. The other minor ethnic groups grow field crops and practice intensive horticulture in the Gash Agricultural Scheme and adjacent areas where there is groundwater. Three main farming systems can be recognized in the Gash irrigation area.

34. **Agro-Pastoralism.** This system is characterized by reliance on livestock for social status and perceived wealth. A narrow range of crops is grown at subsistence level on the Gash flood plain and the terminal fan, and in other areas such as Gash river overflow course to the west where moisture is available after flooding or rains. The system is traditionally practised by the Hadendowa tribe (and other Beja groups) who range over the north east of Sudan west of the Atbara and Nile rivers north to the Red Sea. The herd composition is dominated by cattle that migrate over the rangeland relying on natural grazing and browse after the rains. Small ruminants are confined to the areas around the camps and water points. Camels are the prestige animal.

⁶ Underground cistern constructed to store overland flow. They are also used in hafirs for underground storage to reduce evaporation losses. At present there are 280 hods constructed over the range of which 25 are located on the Gash flood plain. Each hod serves a range of around 2.3 km radius, which is suitable for grazing small ruminants.

35. Estimates of livestock numbers before the 1984 drought and 2002 indicate that, contrary to the common interpretations, there has not been a sustained loss of animal wealth within the global context. The situation is confused and livestock ownership is skewed; the Hadendowa herds probably have not recovered, which may have allowed other pastoralists such as the Rashaida with more pragmatic attitudes and diverse income sources to fill the vacuum on the range.

36. Interaction between livestock and crops is limited to grazing crop residues after harvest. Fodder crops are not generally grown although animals may be let into crops to forage in periods of feed shortage. This can be a source of conflict and other farmers may retain guards to protect their field crops until grain harvest. The main crop grown is sorghum. Land preparation may be carried out by tractor – animal traction is not practised – or manually. All other cultural practices are undertaken by hand.

37. Women are allowed to own livestock. Husbands traditionally give cows to women as wedding gifts and subsequently women can acquire a considerable animal wealth through breeding and trading. Hadendowa women own 60% of the cattle in the Gash Delta and men frequently herd their wives' cattle rather than their own. There are taboos; for example, women cannot milk cows under tribal tradition.

38. **Tenant Farming System.** The system was originally established to exploit the Gash Irrigation Scheme for cotton production. It was characterized by land ownership by the scheme owners – the Government of the day – communal traditional rights of the Hadendowa over the land, and tenant farmers. Under the farming system the tenants grew a regulated amount of cotton (10 feddans) as a cash crop and an area of sorghum (1 feddan) for food self-sufficiency. The tenants provided the labour – or paid wage workers – while the scheme management provided seed and was responsible for the operation and management of the irrigation system. Scheme management also arranged the ginning and marketing of the cotton crop. The income from the sale of cotton was divided equally between the tenants and the scheme management. The scheme management's portion covered the costs of seed, ginning and marketing charges and its profit.

39. The crop mix relied on cotton yields and a sufficient commodity price to economically operate the scheme. Falling cotton prices in the 1970s and reduced deliveries to scheme management – in part due to increased incidence of smuggling – and high prices for vegetable oils, caused a shift to castor seed production. Castor remained the main cash crop in the farming system but with declining production and profits until the mid-1980s. Since then, the farming system has relied on sorghum due to the overwhelming need for food crops and the tenancy land allocations have been fragmented due to pressures from Hadendowa households moving onto the Gash flood plain.

40. The farming system has relied on a rotation where only one third of the net command area is cropped and irrigated each year to match the quantity of water diverted from the Gash river flood. Silt deposits from the flush have provided sustainable production for some 80 years with no perceivable deterioration in soil fertility. The system remains fundamental to the successful rehabilitation of the irrigation scheme and is practised by both the Hadendowa and investors. It is adaptable to a range of cash crops to increase farm profitability when tenants' farms are of an economic size that sufficient revenues can be raised to pay water rates which can be applied to the scheme's maintenance and operation.

41. **Horticultural Farming System.** The horticulture farming system is the one of the foundations of the economy of Kassala State and generates significant wage labour demand. It is becoming an increasingly significant component of the land utilization on the Gash flood plain and involves perennial irrigation. It is practised mainly by minority immigrant groups who have the financial resources to install necessary private irrigation infrastructure. Water is abstracted by pumping from wells sunk on the shallow aquifers on land that is not inundated by flood. The irrigation method involves small border check basins and intensive crop husbandry. The dominant vegetables and fruits that are produced are onions – both for the fresh market and for dehydration – and bananas. The

horticulture farming system has the lowest livestock-crop interaction of the three farming systems in the Project area and most horticulture farms are fenced.

II. PROJECT DESCRIPTION

B. Project Rationale and Objectives

Project Rationale

42. Policy areas important to the generation, growth and sustainability of Project's benefits include.

- (a) The establishment of a strong, professional and independent management of project-related resources that is responsive to poor beneficiaries' development needs. The **sector policy context** for achieving this includes: promotion of good local governance and clear responsibilities for Government bodies; relaxation of pricing and marketing controls; greater farmer crop choice; privatization; decentralization; participation and associated legal structures, for example, FU and WUAs.
- (b) **Land tenure reform** directed towards equity, sustainable land use and capital investment in irrigation and farm production is required.
- (c) **Irrigation reform** policy geared to economic self-sufficiency and sustainability and complemented by disaster preparedness measures is important.
- (d) **Research and extension** policy needs to reflect more fully the needs of poor rural producers.
- (e) **Rural financial services** policy needs to be directed towards allowing poorer producers to build up and operate sufficient assets to escape their poverty using community group-based financing modalities.
- (f) There is a need for policies for **social services support** in the context of poverty-reducing investments in production and gender-sensitive development initiatives.

43. The Project design takes these key policies into consideration and is also fully consistent with IFAD's regional strategy and Government poverty reduction strategy and will:

- (a) Pilot critical policy reforms in the field of land tenure, and devolution of land and water rights.
- (b) Concentrate investments on the regeneration of the livelihoods of disadvantaged rural populations.
- (c) Address issues of direct relevance to the livelihood strategies of the target group.
- (d) Empower women to participate more fully in the development process.
- (e) Assist the development of partnerships with local level civil society institutions.

44. Specifically, the Project has been formulated and appraised in such a way that it will have the following strategic characteristics:

- (a) Simple design with a few clear components, straightforward funding and disbursement mechanisms.
- (b) Implementation through existing federal, state and local institutions and their strengthening where necessary.
- (c) Concentration of project activities in a defined project area.

- (d) Preferential selection of poorer households for all investments, including for irrigation support; priority given to female headed households.
- (e) Strengthening of the empowerment process of local populations through emphasis on the use of decentralised implementation mechanisms and community and demand based approaches.

45. Project rationale is based on the fundamental premise that sustainable livelihoods can be re-established for the poor in the Project area by combining rehabilitation of the irrigation system with a more equitable land tenure mechanism which will ensure that the largest possible number of poor farmers have stable tenure on small but economically viable holdings. According to the same rationale, the landless and women in particular, will be enabled to achieve sustainable livelihoods through support for the development of off-farm income generating activities. Rationale for the design is also based on the expected positive relationship between development and peace: improving the living standards of the majority of poor people in the area should reduce social tensions. Active participation of the intended beneficiaries in detailed design and implementation of activities at the community level and community endorsed participatory selection of beneficiary tenants are expected to ensure overall support for the Project approach among the population of the area.

46. The Project will address the problems of those remaining landless by providing them with viable income earning potential both in the services and the livestock sectors. Part of the Project rationale is to ensure sustainability of interventions, which should be achieved at community level by empowering communities to directly manage their assets and services and by working through the most effective local level institutions, whether administrative or elected.

47. **Participatory Approach.** The participatory approach is fundamental to Project design and is based on the highest possible level of involvement by the target group members in all aspects of implementation. It will be a major element in ensuring overall acceptance by both the government and the target group universe of the new land tenure arrangements. Towards this, the participatory approach will encompass the processes of representation and arbitration, and implementation of criteria for selection of farmers in GAS as demonstrably as possible – and with endorsed authority.

48. Communities will access funding for community investments on a participatory basis and will be expected to take an active part in the management of their associations whether for irrigation or for domestic water supply and other specific interests, such as the use of the range. In the larger villages, women and other micro entrepreneurs will form production – for the purchase of inputs – and marketing groups. In brief, the Project approach will be to provide training and capacity building in technical and financial management to ensure the beneficiaries' ability to manage their economic and social assets, giving priority to improvements in living standards for the poorest in the population.

49. The Project approach will also focus on strengthening the State and Local agencies that are best able to ensure the sustained effective and efficient management of the rehabilitated infrastructure and provide the social and economic services needed at the local level.

50. **Gender Equity.** The gender situation in the Project area varies according to the socio-ethnic groups. While women's economic role is considerable in some social groups; in others, most women live a secluded life at home and do not participate actively either in farming or in livestock husbandry. It will therefore be essential to have a diversified approach to ensure that both men and women benefit equitably from Project investments. Although it will be extremely difficult to achieve such gender equity, women's living conditions can be enhanced and that they can gain significant benefits through a carefully designed programme. In this programme specific activities, which will directly affect women's livelihoods and their empowerment, will be developed to reach the most isolated women, and gradually bring them into the mainstream of social and economic life. Focus will initially be concentrated on the poorest women household heads whose economic and social situation is worst. Project financing will be allocated to activities.

51. **Gash Agricultural Scheme.** The institutional arrangements will have the following features. Firstly, operational functions at block and masga levels will be the responsibility of WUAs, and GAS will have responsibility for assuring the supply of water to the main canals and masga outlets and contain a small but competent staff. There will be a clear demarcation between GAS and MOIWR with respect to the Gash river waters. Secondly, GAS will continue to be an autonomous entity under the auspices of the Federal Government; overall responsibility for the scheme will rest with a Board of Directors (BOD), reporting to the Federal Minister of Agriculture. Towards this, the present BOD will be streamlined as an effective policy and administrative organization, and contain with due representation from the apex organization of the WUAs. Thirdly, the BOD will be responsible for the operation and maintenance of the scheme, for the budget, and the selection, retention, training, incentive structures and disposal of GAS staff. Fourthly, the Project Executive Board (PEB), which will be closely linked to the BOD, will be responsible for the proper functioning of GSLRP.

52. Between 90 000 and 120 000 feddans may be irrigated⁷ with a relative degree of annual reliability. With a change from the present three-course rotation to a two-course rotation based on an economic farm size of three feddans under a cropping model of one feddan of sorghum and two feddans of fodder crops (or a cash crop of farmer's choice) some 30 000 to 40 000 tenants will have access to irrigated land on the scheme. While this may accommodate the existing tenants it cannot absorb the entire primary target group including those that are currently landless. This enforces the view that the mechanisms for land policy and the settlement of land rights, will need to be transparent and based on clear eligibility criteria for selection of farmers. Similarly, allocation of wet lands will need to be based on clear prioritization criteria and transparency. Guidelines for the selection criteria are provided in Annex 1 for which the agreement of GOS has been secured during appraisal, including the formation of legal committee to establish land rights. Responsibility for land allocation will be vested in an independent body and negotiated among the respective stakeholders.

Project Objectives

53. The overall **goal** of the Project will be to regenerate the livelihoods of the maximum number of poor people in and around the Gash delta, compatible with the efficient and sustainable use of its land and water resources and based upon a shared vision of development and stability of the related institutional arrangements.

54. The **purpose** of the Project is to ensure an efficient, equitable and sustainable operation of the Gash Agricultural Scheme and its integration into the local economy.

55. The **specific outputs** of the Project are: (i) the elaboration and maintenance of a shared vision of development; (ii) establishment of the related institutional arrangements appropriate to the shared vision; (iii) rehabilitated water and other social infrastructure and water harvesting devices; (iv) improved crop and livestock husbandry practices; (v) establishment of financial services and a community initiatives fund; and (vi) strengthened State planning capacity.

(b) Project Approach

56. The implementation approach will take into account enabling policies aimed at securing equitable access to strategic assets- land and water- by the primary target group. To this effect, five policy areas will be essential for the reform process required to ensure the Project is successful. These policies relate to water and land rights, infrastructure, WUA membership rights and organization. Most of these measures will be implemented in concert with the rehabilitation of the irrigation infrastructure for each block.

⁷ In addition, upwards of 3 000 feddans may be used for horticulture using groundwater resources.

57. Under the Project approach the Government will undertake priority actions to ensure that institutional reforms and physical rehabilitation will be done in a timely manner. Towards this, the Government will need to establish before loan signing:

- (a) The legal committee for land reform (LCLR) to address present land tenure arrangements and allocation of land in the Project area.
- (b) An inter-ministerial decision on the respective responsibilities of the Gash Agricultural Scheme (GAS) and MOIWR in regard to river control and stream regulation, and scheme rehabilitation and development.
- (c) A senior coordinator for the crash programme with demonstrable experience in management of irrigation development projects and in facilitating inter-agency collaboration to monitor the timeliness of activities undertaken by GAS, MOIWR and FNC as detailed in the crash programme
- (d) The approval of the crash programme budget.
- (e) A draft text for the legislation on community based and resource based users' associations such as WUAs. It will be based on similar previous experiences in the States of West, North and South Kordofan and will be voted at Kassala State level.
- (f) The candidate for the post of Project Coordinator who will participate in Loan Negotiations.

Action Research and Impact Monitoring

58. The enabling policies listed above need to be supported by specific action research activities consistent with the time frame of the policy reform agenda. Consequently, the Project will include provisions for carrying out such research and studies. To the extent possible, these will be conducted as part of the impact-oriented monitoring activities with the support of short-term technical assistance (mainly national).

Innovative Features and Linkages to Corporate Strategy

59. The Project will be IFAD's first intervention in Sudan since the COSOP and generally follows its thrusts in line with IFAD's strategic framework and regional strategy for the NENA region. In this regard the Project targets a geographical area with a high concentration of poor with the aim of infrastructure rehabilitation, community-based development and empowerment, focussing on crop and animal production and equitable access to natural resources.

60. GSLRP is an investment project whereby it will create opportunities and incentives for reforms rather than relying on measures such as loan conditions and government assurances. It has several other innovations. The first relates to land reform to ultimately provide farmers with secure, stable land tenure. The second relates to the introduction of the concept of Water Users' Associations with responsibility for the development, maintenance and operation of their members irrigation enterprise from the collection of water fees. In this regard, partnerships will be formed among WUAs, their apex organization, scheme management and Government to assure the sustained and profitable operation. The third relates to application of a rangeland management and conservation strategy to enhance the capacity of landless (in terms of irrigated land) to improve their livelihoods, through the commercial exploitation of invasive tree species in a control programme. The fourth relates to the methodology of outreach to women in conservative societies through a comprehensive local training and awareness programmes directed at both women and men and local leaders, for building their capacity to become productive.

(c) Project Components

Summary Description

61. The Project will be implemented over a eight-year period and is composed of five components:

- (a) **Irrigation Infrastructure Rehabilitation** that will enhance the capture of flood waters through better control of river flow, reconstructing the water reticulation network canals and access roads, and improve field layouts.
- (b) **Animal Production and Rangeland Management** that will improve animal health services, restock men and women with improved animal breeds, and develop a sound land use policy through the rehabilitation of community-owned livestock water facilities, construction of water containment and spreading structures, and control of mesquite invasion.
- (c) **Community Development, Capacity Building and Empowerment** that will increase drinking water supply and quality by refurbishing existing facilities, build the capacity and empower communities through training both men and women, group formation, and provision of community initiative grants - on a matching basis - for social services support.
- (d) **Financial Services and Marketing** will allow the target group the resources to increase their productivity through the provision of credit lines for improved crop inputs and a community based investment credit (CIC) operated by a participating financing institution (PFI) for groups such as WUAs for the acquisition of farm machinery, food processing enterprises and pre-financing for produce marketing and for poor men and

women acquisition of livestock, food processing equipment, micro-enterprises and income generating activities.

- (e) **Institutional Support** that will encompass the formation and empowerment of WUAs, GAS, State Line Ministries and agencies, and the Project Coordination Unit to assure that the Project parties can achieve the objectives.

Component 1: Irrigation Infrastructure Rehabilitation

River Control and Stream Regulation

62. Under the Project, GOS and IFAD will support river control and stream regulation works by MOIWR on a proportional financing basis.

63. **Works Upstream of Kassala Town.** Due to erosion on the left bank of the river at Gira'a near the border with Eritrea, the river is changing its course westwards. An island has formed in the original river course and immediate intervention is needed. This will involve the construction of a channel 1 000 metres long, 50 metres wide and 3 metre deep along the original river course.

64. **Works in Kassala Town Reach.** The river control works in the Kassala town reach involves a system of flow containment spurs which project into the river. They incorporate a heavily protected head at the river end and a shank connecting it to the bank. In this way the effective width of the river was reduced to about 120 metres; the area between the spurs became silted up and could be reclaimed for agriculture. The system was complemented by earth embankments – tie banks – running parallel to the river connecting the landward end of the spurs. A programme of new spur construction using a more conventional pitched design will be implemented. To date, 28 spurs have been constructed out of the total number of 44 required for the protection of Kassala town. These spurs and their tie banks will be repaired and the remaining 16 spurs and their associated tie banks constructed.

65. As well, to properly protect Kassala Town from floods, the Khor Sumeit offtake will have its capacity increased. This may be done by constructing another offtake structure. Also, the old bridge to Kassala from the Port Sudan road is throttling the flow of the water due to siltation and the slab of the bridge will be demolished or raised, and the river bed will be excavated.

66. **Works Downstream of Kassala Town.** The initial step in river control and stream regulation will be the development of enhanced design criteria for the diversion of flood waters from the Gash River. This will include such parameters as the angles required to ensure that water can be abstracted at the canal offtakes at levels that flow in the main canals and reach the command area fields. The works will involve the construction of new and repair of existing river bank protection and control structures.

67. The river control structures will consist of rock pitching with random placement on gravel and sand filter; and of such size and batter that it will be stable under maximum flood flow energies. Improvements to stream regulation will include the construction of short-crested trapezoidal section concrete weirs or gabions and associated works; where needed new offtake structures will consist of concrete-stone structures with open-orifice gates and drop-logs, or undershot screw-controlled gates.

Rehabilitation of GAS Infrastructure

68. **Main Canals and Structures.** The Project will support the engineering design and earthworks for main canals to be reformed to their original design. The *masga* inlet structures will be repaired or new ones installed as the case may need. The existing open-orifice inlets from the main canals will be repaired and their drop-logs replaced where necessary. Pipe culverts and inlets with no regulator device will be substituted with open-orifice or undershot screw-controlled gates. It is expected that some 70 *masga* inlet structures will have to be replaced under the present block layout.

69. **Roads and Cross Structures.** Access roads are needed on the main canal embankments, along *masga* canals, along the western embankment of the river from Kassala to Wagar as well as to sites where river works will be undertaken. Also, existing raised roads need maintenance. Roads on the main canal embankments will be constructed by widening the two top embankments widths to six metres each and machine compaction. Those along *masgas* will be constructed by widening only one top width on the right side of the *masga* (no irrigation). The roads will be raised, six metres wide and one metre high, with a 2:1 side slope. A 100 mm gravel layer may be added on the top of the roads. Pipe culverts will be used for crossing field channels where required.

Component 2: Animal Production and Rangelands Management

70. The Project will support activities to reduce the incidence of livestock disease and increase production by breed improvement and restoration of disadvantaged households' livestock numbers. As well, a sound land use policy will be developed by rehabilitating community stock water facilities, construction of water containment and spreading structures, and management of mesquite invasion.

Animal Health and Production

71. **Veterinary Services.** The Project will support investments to strengthen animal health services by improving the Animal Health Administration (AHA) facilities. The office at Aroma will be upgraded with the construction of an integrated veterinary centre. The veterinary clinic at Wagar in the North of the Project area will be re-established with the inclusion of a diagnostic laboratory, an examination room, operating theatre and dispensary. As well as civil works, the veterinary centre and clinic will each be provided with the necessary equipment for their operation.

72. To expand the outreach of AHA services, two task-fitted mobile veterinary clinics will be procured. They will be deployed to the veterinary centre and clinic to provide outreach to areas of livestock concentration in the Gash and Hamaish Koraib localities. The schedule will include routine visits to population centres in the Project area and recurrent seasonal visits to stock water points in the irrigation scheme and on the range. The two veterinary officers providing services in the field with the mobile clinics will be provided with appropriate housing. The mobile clinic veterinary officers, veterinary technician and driver will also be supported with the payment of salaries and allowances. The Project will also finance the mobile clinic's operation and maintenance costs.

73. **Animal Health Agents.** Both men and women will be selected by the tribal groups and trained in preventative animal health care, simple curative procedures and improved animal husbandry practice. They will take up the responsibilities for routine basic animal health care in the villages and camps and be given follow-up training by AHA veterinarians at annual workshops. They will also be trained in record keeping and basic accounting principles.

74. The animal health agents who successfully complete the training courses will be certified to practice by AHA be supplied with a basic kit and initial supply of medicines and drugs. The basic kit and initial supply of drugs and medicines will be provided by way of a loan to be repaid in instalments geared to the seasonal pattern of demand for animal health services. The animal health agents will operate under the supervision of the veterinary officers attached to the mobile veterinary clinics. They will conduct their practice on a fee-for-service basis with an agreed margin on the price of medicines from the veterinary revolving fund to assure a profitable income and maintain their competitiveness with AHA veterinarians. The re-supply of medicines to the animal health agents will be made on a cash payment from their profits.

75. **Veterinary Drugs Revolving Fund.** The Project will establish a veterinary drugs revolving fund within the AHA under modalities that will involve the procurement of medicines at bulk wholesale prices and their supply to animal health agents at cost plus a mark-up to cover losses from spoilage and use-by date expiration.

76. **Animal Distribution and Improvement.** A large number of the landless and poor women and men have lost most of their animals because of recurrent drought and the effects of desertification. They will be assisted in restocking to sustainable levels so that they can improve their family incomes. The priority target group will be poor women and in particular women household heads. As women prefer goats – their milk is used by the family and sold – they will be provided with a nucleus herd of goats. This will be done through a community initiative under modalities that may include the return of the first borne to the women’s group for redistribution to other beneficiary members within the group.

77. Livestock improvement will be undertaken on a community group basis where improved sires will be provided on credit and lent on to livestock owners who will be responsible for the husbandry of the animals under the supervision of animal health agents and overall auspices of AHA.

78. **Dairy Production.** The Project will also encourage dairy production based on a mixed farming system, where the main focus will be on increasing milk production and productivity through improved breeding and use of fodder feed supplements, and small scale dairy products processing.

Rangelands Management

79. **Rangelands Management.** A range monitoring system will be established in PY1 with the full participation of the Hadendowa tribal leaders and spontaneous range users associations. As the first step a range management study will be initiated immediately after Project start-up; MAAWI range and pastures officers and Kassala Drinking Water Corporation staff will be trained in geographical information systems (GIS) and provided with the necessary tools including appropriate satellite imagery for range reconnaissance and hydro-geological survey to identify potential groundwater locations. The proofing of the groundwater resource will be done by EMS techniques and test drilling.

80. A comprehensive land use plan for the Gash flood plain and Gash Die will be developed. The plan will include the mapping of land classes for irrigation, areas identified for future expansion of the irrigation scheme and lands to be set aside for forestry and pastures within the irrigation scheme. This will be complimented by a comprehensive range management programme encompassing the adjacent rangelands and mapping of the land use potential capacity and water resources.

81. The adjacent rangelands will be improved with the construction of water conservation works to retain rainfall and enhance pasture regeneration by expanding on the initiative already started by MAAWI. Low banks will be constructed across the contour with graders or tractor drawn one-way ploughs and directed towards stock water points. Where seasonal khor flows can be used to enhance rainfed agriculture through water spreading, in particular to the East of the Gash River, simple gabion structures will be installed under beneficiary contribution modalities.

82. Strategic water points will be located to meet the requirements of conserving the range and to optimise the distance livestock travel to water over the range. The basic tenet will be to maintain a range utilization practice that remains water-limited. The criteria to do this will involve parameters such as the distance livestock can travel to water⁸ while minimising their impact around the water points. The rehabilitation and construction of the livestock water points will be done with the full participation of the communities and contribution to the works in cash or kind, and procedures established for community maintenance of the water points.

Mesquite Control

83. Mesquite infestation is a prime concern of the GAS and members of the target group currently exploiting the irrigation scheme. The problem is to a large degree a result of poor field and marginal

⁸ For example, best management practice would limit the distance sedentary goats have to travel to water to no more than 2 km, and to 17.5 km for cattle.

land management arrangements. While it is recognized that mesquite eradication will be a major activity for IFAD-financing support, the responsibilities for recurrent control and the economic benefit derived from charcoal manufacture by the target group will need to be undertaken before the modalities of such action are formulated.

84. On the range, mesquite control in conjunction with range user associations will be the responsibility of the MAAWI Range and Pastures Department, and FNC where reforestation activities have been agreed. Provision has been made to reforest some 25 000 feddans on the range and in the public areas of GAS.

85. A strategic plan for reducing mesquite infestation in irrigated fields and its containment on public lands and river banks will be given high priority at Project start-up. It will take due consideration of mesquite's economic importance as the primary source of cash income, particularly for the landless, and river bank stabilization effects. The plan will identify suitable alternate non-invasive tree species for establishment on public lands and women's group woodlots in the GAS area. Such tree species will include tree legumes well as other trees with extensive root systems.

86. Once prepared, the plan will be presented to the stakeholders – the tribal leaders, tenant farmers, charcoal makers and FNC – for their agreement. Central tree nurseries and women's group nurseries will be established. A capacity of over 1.0 million trees per year over a 5-year period may be required to replace mesquite in the ecosystem, and this is available in the FNC nursery at Kassala.

87. In GAS, a scheduled mesquite control programme will commence in irrigation fields and is expected to be covered by the tenants themselves once they gain fixed tenancies and are assured water supply. It will be coordinated with the crop-fallow rotation and may be done during primary land preparation. Heavy infestations on abandoned fields and public lands may be cleared on a labour-intensive basis to provide paid income to local people. The cost of the control measures will be partially offset by the recovery of wood for charcoal manufacture. Bulldozers may also be used. The methods will involve pushing with open root-rake blades or pulling using a heavy link-chain and metal ball, recovery economic wood, windrowing and burning. Butts and roots will be removed to prevent re-sprouting by cutter bar (a steel knife fitted between two tines and fitted to the 3-point linkage of the bulldozer) and raking. Removal of mesquite from river banks will only be undertaken when replace tree seedlings are available for planting.

88. Reforestation within GAS will be done on a block development basis at the commencement of the rainy season in July-August to increase to opportunity of seedling establishment.

Component 3: Community Development, Capacity Building and Empowerment

89. The Project will support activities that aim to improve access of local communities to safe and reliable domestic water supply, and to improve the livelihood options of households with no registered land on the Gash Scheme.

90. Service delivery under this component will be based on a clear gendered analysis of community assets and needs, and establishment of an elected community development committee with a clear mandate for undertaking development activities that have both community wide benefit and that enable poor households to improve their livelihood options. Given that many of the activities undertaken by these committees are expected to have a higher benefit for women, a target of 50% women participation is proposed. The responsibilities and discretionary powers of the community development committees will be negotiated, agreed with Government and given the force of law.

Domestic Water Supply

91. Communities in the Project area suffer from insufficient and unreliable potable water supply, with the consequence that many households lack reasonable access to water, especially in the dry

season. There is a high differential in the unit cost of water with the consequence that relatively well-off households in large villages pay a lower unit price for water. This situation is maintained by a “monopolistic” system of private or public water management. In addition, unsanitary conditions encourage the spread of water borne diseases.

92. **Pipeline Reticulation Network Rehabilitation.** The Project will undertake the following activities, with support from Kassala Drinking Water Corporation:

- (a) Rehabilitation of the existing water reticulation pipelines with any necessary additional wells at the locations on the aquifer; and complete redesign of the outlet system. Water sources will be determined decided from the hydro-geological study to be done under the animal production and rangelands management component.
- (b) Support to community-based well and effluent works in locations where the pipelines cannot reach, through the community development initiatives.
- (c) Establishment of a co-managed system involving community organizations, localities and the Kassala Drinking Water Corporation for all types of drinking water supply, with provision of the necessary technical and management training its sustainable operation.

93. **Systems for Larger Communities, Smaller Communities and Encampments.** Large, small and encampment communities which are outside the reach of the pipelines may also need support in improving their domestic water supply systems. The Project will finance with matching contribution from the beneficiary communities:

- (a) Engineering design of suitable improvements or repair to the existing systems; including the social aspects of design to ensure clean water availability separately for humans and livestock, hygienic drainage, and other needed facilities.
- (b) Contracting, under appropriate procurement procedures for the cost of the schemes.

94. **Support to Management of Water Supplies.** The Project will support the communities in: (i) establishing democratic procedures for selecting their water management committees, including equal women’s representation; (ii) technical training on water outlet management to enable the communities to make minor repairs and to maintain the outlets on a regular basis, thus avoiding unnecessary breakdowns; (iii) training in management and book keeping to ensure that all financial aspects of these schemes are managed in a transparent and open manner; (iv) training on gender issues related to access, use and disposal of water in order to ensure that the new system incorporates women’s views and participation. Communities will decide through general meetings (if necessary of men and women separately) whether to collect fees beyond the immediate needs of the water scheme and use these funds for other activities or investments of common interest.

Women’s Empowerment

95. The present component addresses issues related to social skills and to enabling selected women to build up their knowledge and skills in technical areas deemed important for the improvement of local livelihoods.

96. Coordination with local NGOs and other donors will be important to ensure that public agencies, community organizations and local leadership build awareness and capacity regarding women’s access to and benefit from productive and social skills; outreach of services to women; and tailoring of services to women’s needs.

97. **Larger Villages.** The Project will offer women a menu including the following: (i) functional literacy training; (ii) hygiene, nutrition and basic health care education; (iii) elementary group management skills; and (iv) advanced training on specialised skills such as midwifery, health assistance, paravet services, agricultural extension, forestry, etc. The combination of training activities

will be identified with the community groups, based on assessment of women's needs and skills, existing resources, future opportunities arising from Scheme and range rehabilitation.

98. **Encampments.** Given the small size of these settlements, the limited productive roles undertaken by women, activities will start with raising women and men's awareness about the importance of including women in social and economic life. Prominent and authoritative tribal leaders and individuals, who can play an advocacy role in this respect, will be identified and requested to take a leading role in these campaigns.

99. Once men's approval has been gained, the work in these communities will start with a series of training and information sessions with women, held at regular intervals, and addressing different topics of interest to them. These sessions will be conducted in such a way so as to emphasize the use of existing resources and knowledge, as well as encourage collective action to resolve common issues. The outcome of these sessions will be the formation of one or more groups of women of different ages wanting to take up specific activities or learn specific skills.

Capacity Building for the Households with No Registered Land on the Gash Scheme

100. The Project will provide the following interventions to assist these households or economic interest groups reach economic self-sufficiency:

- (a) Orientation on management of off-farm enterprises and terms of access to credit services;
- (b) Orientation on book-keeping skills, participatory decision making between spouses or group members, group formation and management;
- (c) Vocational training in enterprises that have a good economic potential.

101. Enterprises will be supported based on an analysis of women and men preferences in light of business development opportunities identified in collaboration with community organizations, traders, and existing banks. Potential enterprises include but are not limited to: livestock trading; marketing of scheme produce; animal pharmacy enterprises; food processing and in particular milk processing due to the increased milk production from the higher livestock productivity; trade skills; fuel wood and charcoal production and distribution; non traditional forestry products; vegetable gardens.

Community Development Initiative (CDI)

102. Following a community needs assessment, and in agreement between community development committees, localities and the Project, the latter will provide financing on a proportional basis, with a 25% contribution in cash or kind from the beneficiary communities and, as the case may need, from the Local authority. The following community initiatives will be eligible for support:

- (a) Social infrastructure and improved services such as drinking water supply outside of the water pipeline reticulation network and education initiatives, sanitation services; education and health services.
- (b) Economic infrastructures such as the construction of basic premises for micro-enterprise production or marketing.
- (c) Transport for local produce and for water transport such as donkey carts and tankers.
- (d) Other potential cooperative or collaborative business opportunities that would be identified by non tenant households and would serve to build women and men's economic skills and income opportunities.

103. In addition to initiatives that have community wide benefits, individuals and groups who have successfully completed the different training sessions under the women empowerment and capacity

building sub-components, will be eligible to win training points that will be exchanged for vouchers with a monetary value. Such vouchers could be cashed for exchange with productive equipment selected by the voucher holder.

Component 4: Financial Services and Marketing

104. The provision of financial services has been found to be a most tangible focus for mobilizing Project beneficiaries and forming their institutions. For WUAs and specific-interest groups, and their members, credit will be required in regard to: water rates and other seasonal inputs to produce cash crops using improved technology packages; the acquisition of income earning community-based assets; acquisition of farm machinery units; storage and marketing of cash crops on an equity sharing arrangement under the Islamic Banking system; and food processing, in particular for milk products.

105. Credit financing is based on two modalities – a credit line for supply of seasonal inputs, and a Community-based Investment Credit (CIC) to meet the needs of WUAs, household consumption needs (pre-marketing), produce marketing food and feed processing. A Participating Financing Institution (PFI) will take responsibility for the disbursement of credit on commercial basis and will contribute 20% of the credit cost. The PFI will receive physical and human capacity building support, but not operating expenses.

106. The credit will be provided to the PFI, under assured modalities that will include a revolving fund and the application of profits from lending to its overheads and operating costs. Savings mobilization will be a prerequisite for obtaining group and individual credit. Such savings will be used to build a guarantee fund and replenish the CIC.

Incremental Credit

107. The credit lines will involve:

- (a) Short-term Credit; seasonal credit for cash crop production and payment of water rates. This will be under a normal credit line facility to the PFI
- (b) Medium-term Credit under the community-based investment credit (CIC) for:
 - Marketing pre-financing.
 - Farm machinery acquisition by WUAs.
 - Livestock acquisition.
- (c) Long-term credit under CIC for off-farm micro-enterprise and for such initiatives as processing plant for products such as milk.

108. **Smallholder Cash Crop Added-value.** While staple grain crop production will ensure the food security of the target group, cash crop production will be fundamental to the economic justification of the Project. In this respect cotton production which was the original cash crop base still has potential for re-introduction although there will be constraints to the marketing chain as ginning facilities are not available in the Project area. There is, however, a wide range of alternate cash crops which will fit the cropping systems and field rotation. These include a wide range of forage or fodder crops and potential field crops, as well as horticultural enterprise.

109. To fully exploit this potential the Project will support a marketing study which will also explore the feasibility of added value enterprise for the purpose of establishing a crop produce processing facility in the Project area. Such agro-industry enterprise might include consideration of fodder pellet or briquette manufacture for both trade and as a local drought reserve animal feed.

110. To establish and ensure the sustainability of the financial services provided by the Project, a credit supply and demand study will be undertaken. The PFI will provide one of its Senior Officers at

its Kassala branch to be responsible for the mobilization of the target clients, for the planning support and control of the financial mechanisms. As well, a mobile bank will be supplied for outreach to clients in the Project area.

Component 5 Institutional Support

111. The establishment and strengthening of institutional framework will be the keystone to successful Project implementation and the sustainability of its outputs. The parties that will be involved include Water Users' Associations, GAS and State government line ministries and agencies.

112. **Water Users' Associations.** Tenants will bear the financial need for the operation, maintenance and improvements of their scheme. In order to be able to do that they must have secure access to land, improve productivity through application of technical packages, increase the water application efficiency and disseminate knowledge and interchange experiences. This can be done through the organization of water users associations (WUA) to participate in the field operations and management of the scheme and thus assure the livelihood of their members.

113. The WUAs will be legal entities under the law of Sudan with legal status under a State government decree to establish group-based irrigation organizations. The State government will also determine the legal status of the WUAs, with respect to financial policy (including credit), and the statutory requirements for audit and arbitration. They will be formed following a set of Project rules developed by the PCU Legal Advisor on the modalities for selecting association members and regulating their operations (these may be modified during the process of mobilization). Each WUA will have an elected Board which will represent the WUA group members. At *masga* WUA level the number of Board members will depend on the number of subdivisions in the *masga*. Its office bearers will include a Chairman (responsible for overseeing all aspects of field development, and irrigation operation and maintenance at *masga* level), a Treasurer (responsible for the collection of water rates⁹ and negotiation with the Project Financing Institution), and a Secretary (responsible for taking minutes during meetings). Assistance will be provided for the formation and registration process, training WUA leaders in group management and community-selected irrigation field supervisors in water management.

114. The establishment of the legal entity of the WUAs will be realized shortly after the start up workshop. In conjunction with block rehabilitation, a predetermined number of tenants will be formed into each WUA which will be entrusted with a fixed land allocation of a *masga* rotation pair. It will be responsible for field development and maintenance, and irrigation and crop production services, including financing, and will remain independent of GAS and other civil institutions. Further stabilization of land allocation at individual tenant level will not be guaranteed until it has been demonstrably assured that the targeted *masgas* can be irrigated reliably through improvements in *masga* design and irrigation efficiency and field development – and tenants are inculcated on the purpose of the WUA and the function of each level of participatory irrigation scheme management, and their capacity built to manage their own operations.

115. At present the *masga* sizes are too large for even distribution of water under flood flow. Possible solutions that will be taken into consideration in the development plan will include the extension of *masga* canals with checks and diversions, reduction in *masga* field-widths and establishment of cross-borders for more effective control of overland flow following a reuse design. Water spreading at the head end of each border will be improved by such methods as constructing a furrow and levelling the first reach of each border.

⁹ Water rates will be apportioned on a formula that takes into account the operations and maintenance responsibilities between the WUAs at the different levels of the irrigation scheme – *masga* and block – GAS and MOIWR for river training maintenance downstream of Kassala

116. Funds will also be provided by the Project for the demonstration of improvement in *masga* design and irrigation efficiency. Water rates will be applied to the costs of block improvement as well as WUA member contribution in cash or kind, and be done by the beneficiaries themselves under fee-for-work initiatives under appropriate supervision.

117. **Gash Agricultural Scheme.** The development of sound management and operational capacity of GAS is fundamental to the success of the Project. To assist in developing its capacity and capability to provide services to the target group, the Project will renovate the GAS workshop and stores and a limited number of houses to accommodate field staff. It will also provide earthmoving machinery and equipment to undertake operations and infrastructure maintenance and a limited number of vehicles, office equipment and office furniture and materials. For the rehabilitation and development of the irrigation scheme the Project will provide technical assistance in design engineering and water management.

118. Key staff will be trained in general management and irrigation operations with the purpose of creating an independent professional management capability. They will also be supported with performance-related allowances, to supplement basic salaries, on a decreasing scale. Incremental operating costs will also be supported – from the first two years – on a decreasing scale as costs are offset by revenues from water fees.

119. **Ministry of Irrigation and Water Resources (MOIWR).** The re-establishment of effective river control structures and stream regulation – both upstream and downstream of Kassala to the Gash Die – will be a prime element of optimising the capture of flood water for irrigation in GAS and safeguarding resources from flood water flow. To assist MOIWR Kassala Office in developing its capacity, it will be provided with earthmoving machinery and equipment to undertake the task. River gauging stations will be re-established with adequate telecommunications and water monitoring equipment supplied, including that required for groundwater testing and measuring. The Project will provide for limited number of vehicles to ensure proper supervision of works. For the purpose of proper monitoring and supervision an Engineering Manager to head the MOIWR team and to coordinate with the GAS and PCU will be appointed. The Engineering Manager, the Engineers responsible for works design and supervision, and support staff will be supported with allowances to supplement basic salaries and a proportion of the operating costs on a decreasing scale, they will also be provided with training to enhance the capacity for future operation and maintenance of the system.

120. **Agricultural Services.** The MAAWI in conjunction with MOAF and ARC will be responsible for defining the technology options available to the target group so that they can fully exploit the opportunities presented by irrigation scheme rehabilitation. Assistance will be provided for an extension leader and a limited number of support staff to be responsible for Project activities and linkage with the local staff cadre and Project beneficiaries. This will consist of the provision of a vehicle for outreach in the field, extension communication aids, performance-related allowances, to supplement basic salaries already paid by the state, and a contribution to the incremental costs directly related to the additional activities related to Project implementation.

121. At local level extension officers will be appointed to provide regular services to the WUAs and will be linked to the GAS block management structure. They will be supported with motorcycles for transport, extension kits, and performance-related allowances, to supplement basic salaries already paid by the state. They will also be supported with funds to establish on-farm demonstration plots with contact farmers, field days to present results, and for the incremental costs of the extension activities.

122. MOAF, as the case may need, and the ARC will be contracted by MAAWI to undertake technology transfer activities and adaptive research. The prime purpose will be the improvement of grain sorghum seed quality and agronomic practices, and the comprehensive assessment of alternative cropping patterns and the range of promising crops – and best varieties – that can be economically exploited in the irrigation scheme. These will include field crops, fodder crops, and fruit trees and

vegetables. ARC will develop from this adaptive research technical packages for each crop under the parameters and variables of flush irrigation – in particular in the Gash – and which match the resources available to farmers and can be demonstrated through extension officer supervised on-farm demonstration plots. To do this, ARC will be supported through refurbishment of the required facility of the Kassala Research Station, provision of a vehicle to work in the field, office furniture and computer equipment, and the necessary field tools and equipment. The adaptive research programme will be financed on a lumpsum and estimated at USD 25 000 per year, to be reviewed on the quality and outcome of the work undertaken as part of the Cooperating Institution's annual supervision.

123. Support to Project Coordination Unit. The Project will have a small Project Coordination Unit (PCU), based in Kassala, which will be responsible for enabling the development of autonomous PIAs and assuring successful implementation of Project activities. Assistance will be provided for staff salaries paid at local UN rates, vehicles, office equipment and furniture, and incremental operating costs. Provision will also be made for external and local technical assistance and studies. As well, assistance will be provided to support the costs of the IFAD Projects Central Coordination Unit in Khartoum on a proportional basis in conjunction with other IFAD projects.

(d) Project Risks and Assumptions

124. There are five main risks that the Project could face and which were discussed at the appraisal mission and that the Government agreed to address. Firstly, there is a risk that the required institutional reforms especially those required for equitable land allocation will fail to keep in tandem with rehabilitation and development. For this assurances have been obtained during the appraisal and again at loan negotiation for government political commitment for legal and joint understanding of the reform and rehabilitation processes. The federal Minister of Agriculture and Forestry issued a ministerial decision on 6 September 2003 to establish the Legal Committee for Land Reform.

125. Secondly, the institutional capacity of GAS is inadequate. A major training programme will be part of the institutional support component and include in-service training and assistance from the advisors in the PCU. Associated with this may be the reluctance of the tribal leaders to cooperate with land tenure reforms and irrigation scheme rationalization. This will be countered by stakeholder consultation and negotiation over clear entry and exit rules from the scheme, the autonomous management structure of GAS with clear delineation of responsibilities and authority between the Government, the native administration and GAS, a phased reform-rehabilitation process, and the development of livestock production – an important source of livelihood and prestige for the leaders.

126. Thirdly, there is the risk that beneficiaries will be unwilling to contribute to the costs of investments in irrigation and water management structures or to assume the responsibilities for their costs of operation and maintenance, which arises because in the past the government have waived water fees. This risk will be countered with the formation of WUAs– building on existing forms and rules of water management (*gura'a sheikhs* and *masga sheikhs*) – and their strengthening to better identify and prioritise the needs of the farmers. At appraisal agreement has been reached on measures and procedures for tenancy reform that will lead to equity and security of land tenure. It will also be offset with the application of labour-intensive works, and the re-introduction of profitable cash crops to augment staple food production. To ensure the active participation of the communities and their organizations in such productive activity, the Project will provide support services including the training of WUAs and extension agents.

127. Fourthly, recurrent drought and poor or high river flow is a risk. The Project design will help to reduce the risk of drought effects and poor flow with enhanced water supply for human consumption and livestock, and water conserving structures on the range. Greater efficiency of water application and capacity for irrigated crop production will result from the improvement in the irrigation network and field layout under the scheme rehabilitation programme. The damage that may result from high flood as was the situation during the appraisal mission will be reduced by the excavation and rehabilitation of control structures on the river course and efficient operation of the irrigation network

inside the scheme. Indeed, as revealed by the Environmental Impact Assessment Study (EIA), the Project will have positive impact on the environment by restoring the operation of the system to its original design when the flood scheme was conceived. As such the Project is environmentally friendly.

128. Lastly, civil unrest around the margins of the Project area could be a risk. The Project design's stress on independent, transparent management, local responsiveness and benefits from both irrigation scheme and off-scheme investments, which together with wider promotion of good local governance removes excuses for civil disturbance and provides basis for conflict resolution.