

Eastern Nile Technical Regional Office

**WATERSHED MANAGEMENT FAST
TRACK PROJECT, SUDAN
DETAILED PROJECT PREPARATION
STUDY**

Environmental and Social Interim Report

Stockholm July 2007

SWECO International AB

Project No. 1989151

COWI

AHFAD University



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1 Introduction

This environmental baseline assessment and social analysis for the watershed management interventions focus in particular on:

- Identification of potential positive environmental and social impacts of the watershed management activities and measures to improve these.
- Identification of potential environmental and social risks and measures to mitigate these.

The social and environmental was conducted through field surveys, Participatory Rural Appraisals (PRAs) and stakeholder consultations in selected focus study areas. The social and environmental assessment findings will feed into the Operational Manual and the Environmental and Social Management Framework.

The social assessment deals with the social dynamics and social key issues in the three project areas using five conceptual entry points¹ for analysis: social diversity and gender; Institutions, rules and behaviour; Stakeholder interests; and Social risks/exclusion in line with the WB understanding of social assessment. The purpose is primarily to inform project design on social dynamics, conflicts and risks that should be addressed and later monitored to avoid detrimental effects on the project outcome. The purpose is also to ensure inclusiveness, i.e. that all key stakeholder and beneficiaries are considered and biases against more vulnerable beneficiary groups ruled out.

Elements of the social assessment are already contained in various documents drafted by the Consultant Team (CT) and this report should be read with reference to these, i.e. the inception report and annexes, the stakeholder data base, the interim technical report, and the interim institutional report. The present report draws together the social assessment elements contained in the various consultancy reports and supplements with additional findings from desk reviews of existing documentation and findings from varies field visits.

2 Social Key Issues in Lower Atbara

2.1 Population

Lower Atbara is one of the least developed areas in the Nile State. The population is estimated at 65,000 sedentary people and 15,000 people involved in pastoralism. 45% of the former population have left the area in response to the degraded livelihoods (reduced

¹ In line with World Bank Guidelines for Social Assessment, e.g. WB/Social Development Department: Social Analysis Guidelines in Natural Resource Management. Incorporating Social Dimensions into Bank-Supported Projects, 2005.

cropping seasons, reduced arable area, drift wood etc.) resulting from the Kashm el Girba dam which was build in 1964. There is a distorted age pyramid as those who have left or leave the area are those in the productive age.

As in other parts of Sudan, Lower Atbara is the home of different ethnic groups. Due to its arid climate and harsh living conditions, especially after the building of the dam, it has to a lesser degree than the other project areas attracted immigration of population groups and IDPs from other parts of Sudan. It has a certain grazing potential and therefore attracted different nomadic groups. The major sedentary tribe is the Jaaliyn. The Rashayda, Bushariyeen and Kamalab are the main nomadic tribes in Lower Atbara area. The first group raises camels and sheep, the second have more sheep and fewer camels, and the third group has sheep and goats. As witnessed during field work, the sedentary population has strong family and neighbourhood support systems and overall Lower Atbara appears more homogenous than in the other project areas and has a lower potential for conflict over natural resources.

As far as poverty levels are concerned, it was reported to the CT that prior to the building of the dam the area was prosperous and the natural resources sufficient to maintain the different livelihood systems. Nowadays, poverty is rampant with an increasing trend as one moves upstream. The CT observed many indicators of poverty as for example poor infrastructure and lack basic social and economic services. One informant advised to use polygamy as poverty indicator. Nowadays it is rare that a man has more than one wife.

2.2 Livelihoods

Lower Atbara is characterised by a variety of livelihood systems comprising mixtures of farming and animal husbandry which have rapidly changed after the building of the Kashm el Girba dam. The sedentary part of the population practises farming along the River Atbara, either exploiting residue moisture in and close to the river bed or by small scale flood irrigation schemes (gerif production) through natural flooding or water pumped from riverside boreholes. Most land along the river has been converted into farming land and the dom-forests that previously could be found in abundance have nearly completely disappeared. Rain-fed farming is limited because of the arid character of the area. Most land is reserved for sorghum production but beans and vegetables are also grown. Sedentary farmers only have small amounts of animals (goats, sheep and chicken) which are primarily taken care of by women.

Nomadic and semi-nomadic groups who have migrated from different areas in Sudan and abroad can be found many places in Lower Atbara. Some have become semi-sedentary but their major livelihood remains animal rearing combined with agricultural labour as coping strategy. The semi-nomadic groups in the southern parts of Lower Atbara engage in agricultural production in response to deteriorated natural conditions for their herds. Together with nomadic pastoralists they move with their animals to Butana during the dry season they return to Lower Atbara to graze their animals on the harvested field where the animals feed on crop residues or trees on government/communal land. This

occasionally leads to conflicts between local farmers and pastoralists. The estimated number of animals in the area is 66,000 sheep; 10,000 camels; and 5,000 cattle.

According to consultations with the Ministry of Agriculture, Animal Resources and Irrigation, Ed Damer Locality Office and NGO representatives (LADC), Lower Atbara comprises three distinct areas with specific socio-economic characteristics:

Area 1: Between Atbara Town and Sidon Town

In this area, most of the people (about 90%) are settled agriculturists. They produce at least two crops per year using both flood water and pump irrigation. Due to more favourable production conditions and vicinity to towns, markets and services (including government planned water supply and electrification), the population is relatively better off.

Area 2: Between Sidon Town and Shababit

In Area 2, the population comprises about 50% semi-nomadic and nomadic pastoralists and 50% settled agriculturalists practising mainly rain-fed and flood recession farming whereas irrigated systems are rare. The area is more arid and degraded than area 1 and only one crop a year is produced using flood water during the high flow season. Some mechanised farmers are leasing land from villages. Production conditions and accessibility are less favourable which is reflected in higher poverty levels.

Area 3: Between Shababit and Kassala border

Area 3 is extremely arid, problems of degradation are most severe and poverty is rampant. Due to its remoteness it is marginalised by the local administration and development projects. The nomadic and semi-nomadic population make more than 90% of the population. The consultant team visited Baluuk and learnt that a substantial number of formerly nomadic pastoralists are engaged in occasional small scale farming as they find it increasingly difficult to maintain and live of their herds. They have given up seasonal migration to Butana or only do it in favourable years (enough water and pasture on the route to Butana). Apparently, only large scale pastoralists can embark on seasonal migration as they can afford to move their animals by truck.

Generally pastoralists lack alternatives to their livelihood practices due to little knowledge of the agricultural sector and high levels of illiteracy which makes it difficult to move into non-farm sectors.

2.3 Land Tenure and Access to Land

It has not been possible to obtain exact figures on land ownership/access to land. Information gathered during field visits indicated that not all families have access to land, instead the men work for other relatives or as labourers on large scale farms or migrate temporarily in search of work in other places or towns. One land owner met on his irrigated land explained that he and his family can not live of the land and that he is involved in trading as well. Other family members and neighbours also expect that he assists in time of hardship.

Average irrigated land (flood irrigation, pumping from riverside boreholes, and exploitation of residue moisture): Less than 2 feddans (Sudanese average is 2 feddans)
Average wadi bed land: 5 to 10 feddans
Rain fed farming is limited due to the arid character of the area

Most of the fertile land adjoining the river is registered in the names of individual landowners. Land away from the River is all owned by the government, but tribal rights of grazing and cultivation are recognized. Tribal leaders organize such land use. The land inheritance system along generations has reduced individual holdings in many cases to areas that are insufficient to support a family and that are too small to justify efficient agricultural production.

The land fragmentation has reduced the farmers' holdings that many of them are in the realm of poverty or have migrated for livelihood elsewhere. In addition, native customs confine their women within their homes, and so preclude them from assisting in cultivation. The lack of crop financing has given rise to a general system of mortgaging crops, often before they are sown. The security of agricultural produce in the study area depends on the fluctuating river flood.

In contrast to the other two project areas, the expansion of large scale mechanised farming has been limited in Lower Atbara and is confined to the areas around Atbara and Ed Damer. Competition for land between the different land user groups is less pronounced. Land fragmentation is partly compensated by traditional family and neighborhood support systems or increased out-migration of the younger population and seasonal work migration. Nomads' and pastoralists' access to routes, grazing areas and water points are not blocked by mechanised farms and they have access to fields after harvest for animal grazing on crop residues, but the problem is rather that communal land due to desertification and sand encroachment cannot support pastoral livelihoods anymore. As discussed in the Technical Report animal density in the area appears to be above the level that could be sustainably supported by the environment.

Farmers along the Atbara River have some livestock which is integrated in irrigated agriculture, contributing a significant proportion of farmers' incomes in the area. The keeping of animals, mostly sheep and goats, is mostly done by women. This change may, however in the future, become a source of conflict between farmers and nomadic herdsman in view of the fact that farmers increasingly see investments in animals as a coping strategy against uncertainties in agricultural production.

2.4 Gender and Vulnerable Groups

2.4.1 Women

Women's role and status in Lower Atbara is primarily determined by Islamic social norms and customs. Men are the guardians of women and exert authority over them and

they are more or less confined to the domestic sphere. Their access to economic life and income opportunities is therefore limited. They get married early and if they go to school they drop out when they get married. Their formal education is poor and their access to external information limited.

As a result of the Islamic-Arabic tradition, women generally do not take part in agricultural production. They help harvesting vegetables (husband grows) and help each other in the fields. They are responsible for the domestic sphere (raise children, collect water, collect firewood, prepare food etc) and they keep goats and sheep and can have their own money from this production. Elder women are involved in vegetable growing. The CT asked for the daily work cycle in two villages which confirms what Bhutaina Elnaiem² found in her study of social institutions and their role on women in Lower Atbara, e.g. women's limited involvement in agriculture and exclusion from domestic and public decision making.

Some of the villages and families visited in Area 1 have access to LPG gas and they have improved water supply close to the house. The work burden of these women is drastically reduced as they are not obliged to go long distances to collect firewood and water. It was the impression of the team that this is the exception rather than the rule, especially in areas further away from Atbara town where girls and women's work burden still is huge.

Despite of this, the SOS Sahel project has been successful to organise women in most of the villages. The CT has visited some of the women who were supported by the organisation and found functioning tree/bush planting schemes (trees for shadow, fruits, henna production) in and around the homesteads and some home gardens for vegetable production. In contrast, the ADS project was not successful in targeting women with income generation from food processing such as juice and jam making because markets/demand are not easily available.

Development options for women:

- Revitalisation of SOS formed women groups which exist in almost all village;
- Tree planting in and around homesteads and tree nurseries for re-forestation and shelterbelts as they are not involved in agriculture
- Small scale animal rearing based on zero grazing and fodder production;
- Reduce work burden - firewood, drinking water, and intermediate means of transport.

2.4.2 Nomadic Pastoralists

According to meetings held with Ed Damer Locality staff, the chairman of the "Company for the Development of Lower Atbara" (successor of ADS) and the nomadic communities in Baluuk, the nomadic and semi-nomadic population is concentrated in the part of Lower Atbara closest to the Kassala border, i.e. Shababit and below (Area 3). It is assumed that about 90% of the population in this area is nomads or semi-nomads. At the

² The Impact of Social Institutions on the Role of Women: Insights from a Rural Area in North Sudan, OECD Development Centre, 2004.

same time, they are the most deprived population group in Lower Atbara and the environmental problems are the most severe (desertification, excessive tree cutting, sand dune encroachment). It appears that major animal routes between Butana and Lower Atbara pass through this area. Interventions to address nomads' livelihoods should focus on this area.

During visits in Atbara the CT was strongly advised to visit Baluuk and surroundings as this area due to its remoteness has been neglected by NGOs and government alike. Baluuk and the surrounding villages are inhabited by Bushariyeen nomads.

They practice a mixture of herding and agricultural production. The latter they resort to as it is increasingly difficult to make a living from herding alone and only if water availability in the Atbara river allows for this which is not the case every year.

The CT met the community in Baluuk (both men and women) who suggested that the FTP supports two planned small scale irrigation schemes in the area for which the government has conducted a number of studies but not yet provided funds.

Lablaba and Hawi schemes would benefit 12 villages. The advantage of the schemes would be that an already ongoing voluntary re-orientation among the Bushariyeen nomads towards a more sedentary lifestyle and agricultural production could be strengthened, that women - who have expressed a wish for this and who are currently completely dependent on their husbands - could make an income from vegetable production, and that water could be made available for environmental activities such as establishment of shelterbelts to halt sand dune encroachment and tree planting in and around homesteads.

The population in Area 3 is aware of the poor natural resources of the area and realises that there is a need to diversify livelihood practices. Some households have already settled and they are very much interested in the further development of two planned irrigation schemes (i.e. Lablaba/Hawi schemes = 30 000 feddans) by the Government. The FTP could support this and thus address poverty and land degradation through pastoralism at the same time.

Because Lower Atbara provides little grazing options during the dry season, they depend on local farmers' consent to let their animals graze on the harvested fields and feed on crop residues, or trees, shrubs on government/communal land. This occasionally leads to conflicts between local farmers and pastoralists. The Butana area where pastoralists move with their herds during the rainy season is increasingly subject to investments in large scale mechanised farming, which threatens the pastoralist livelihoods. As mechanised farmers and absentee landowners is one of the most powerful groups in Sudan, restrictions to the further development of mechanised farming as demanded by the Pastoralist Union ("Butana should be for the pastoralists; it could be designated as pasture and irrigated from the Nile and Atbara") may be resented.

2.5 Local Stakeholder Interests

The key local stakeholder groups and potential project beneficiaries in Lower Atbara are the various male and female users of land and natural resources described above. In addition there are a number of organizations that represent these groups or should be considered as project partners. They include:

- NGOs: Sudanese Environmental Conservation Society and Society and SOS Sahel are the most important.
- Women's groups formed with the help of SOS Sahel exist/are active in most villages and they have an apex organization with representation in Ed Damer;
- Village Development Committees formed during ADS;
- Lower Atbara Development Company (former ADS Apex organisation)
- Traditional administrative structure (including nazers, omdas, and sheiks);
- Formal local government and village structure (e.g. village people's committees)
- Farmers' Union representing all farmers and agricultural companies;
- Pastoralists' Union representing nomadic and sedentary pastoralists.

In several villages, the CT found that the village development committees formed during ADS which are collected under the umbrella of the Lower Atbara Development Company were dormant. The reason seems partly to be that ADS supported activities were not sustained after the project was terminated so that the VDCs "have nothing to do". However, in other villages VDCs were transformed into well functioning cooperatives/companies which has resulted in economically thriving villages such as Goz El Halek where a tractor and truck for transport of produce is now available.

The CT also realized that there is a general distrust towards Lower Atbara Development Company which has taken over the remaining assets from ADS and was supposed to consolidate and further develop the ADS achievements. The population does not perceive the company as supporter but rather as an organization to support the interests of a few office holders at the top of the organization.

Locality and Administrative Unit authorities are little recognized because of their limited outreach capacity and presence in the area. Popular committees are not always seen to really represent the population.

The semi-sedentary pastoralist community in Area 2 and 3 do not have village development committees partly because the outreach of ADS was limited and partly because they prefer to work through the traditional administrative system. For the same reason local government authorities enjoy little credibility. Traditional leaders are an important stakeholder group because informally they still play an important role in regulating village life and allocation of customary land. One of their former roles was to mediate conflicts and still today they may be an effective means for mobilization, negotiation and conflict resolution.

When dealing with farmers' union and pastoralists' union it is important to recognize that they tend to represent the interests of larger, more affluent groups whereas small scale farmers and small scale pastoralists have little influence and are marginalized in these organizations.

Some stakeholders such as women's groups, women headed households, female pastoralists and youth are extremely weak in raising their voices and demanding their rights. For the FTP it will be important to ensure that they are not overlooked and included in the preparation of the projects and its benefits while at the same time take care not to cause conflicts within families.

2.6 Experience with Participation

In Sudan in general, experience with participatory approaches to planning and implementation of development projects is limited. On the one hand, unlike other countries in Africa, during the last 20 years Sudan has experienced little exposure to western donors who have been a driving force in the dissemination of the popular participation agenda which is not compatible with the political situation in Sudan. Few localities use participatory processes or make any attempt to involve communities in the planning. This is also valid for the Ed Damer Locality however, to a lesser degree.

The ADS project made an effort to build capacity in participatory planning and management which has resulted in Ed Damer Locality based NGOs and CBOs being familiar with these working methods. Although, participatory planning in its true sense of empowerment has not been practised in the Lower Atbara in previous interventions at least the awareness has been build.

Resource people for community mobilisation are available among locally based NGOs and CBOs although training would be needed. Participatory planning would also require the permanent presence of Locality staff e.g. agricultural and forest extension staff in the administrative units which is currently not the case.

Participatory planning and management interventions could build on the organizational structure left behind by ADS in all 51 village clusters (covering all villages) where voluntary development societies, and village development committees were established. The structure of women's groups established under the SOS Sahel project could also be revitalised.

However, during the various missions the CT has met many of these organizations and found that their planning and managerial capacities are still weak and that they would require intensive retraining and capacity development. Inclusiveness of women, female headed households and nomadic pastoralists also needs to be improved.

Furthermore, it appears that the semi-nomads in the Baluuk area to a certain degree have resented the ADS structure and prefer their traditional structure; there is a need to bring the two together. The locality authorities also advised on the need to avoid former

projects' high overhead costs which resulted from the fact that project staff and locality counterparts resided in Ed Damer which necessitated frequent and expensive travels.

3 Social Key Issues in and around Dinder National Park

3.1 Population

Before the last century, apart from Magano village in the south of the park, the area in and around Dinder was unpopulated. Since the beginning of last century there has been a large influx of people from other parts of Sudan and West Africa. In the 1950's the area was opened up for largely unplanned and uncontrolled mechanised farming which in turn attracted increasing numbers of workers to the area. In the 1970's, in response to the new Land Act according to which all unregistered (mainly customary) land became government land, tribal leaders distributed public land to migrants to consolidate their power. In the 1980's, settlement of the area was intensified by in-migration of population groups from drought and famine stricken areas in Western Sudan and West Africa. Finally wars and civil unrest contributed to increase the population through an influx of refugees and IDPs.

Therefore the villages are social diverse and comprise a multitude of tribes. Those from Western Sudan constitute 43%, followed by Arab tribes (20%), West African tribes (13%) and Nilotic tribes (8%). Since their establishment all villages have experienced rapid population growth.

The population figures for 2004 were as follows:

| <i>Location</i> | <i>Estimated Size of Population</i> |
|-------------------|-------------------------------------|
| Rahad villages | |
| • Total | 150,000 |
| • Inside the park | 10,000 |
| Sennar villages | Not available |
| Magano | ca. 500* |
| Kadalu area | 10.000 |
| Number of herders | Not available |

Source: HCENR: Participatory Planning Workshop, 2004

* According to comments by the client received on the Inception Report

Poverty levels are high in the area as a substantial proportion of the population is landless and/or belong to the group of IDPs that had to leave their home area because of drought, famine and war. This is expressed in selected poverty indicators:

Illiteracy levels are very high. According to the 2001 baseline survey conducted by the DNPP, 86.6% of all men and 96.6% of all women are illiterate. The number of female headed households which are usually among the most vulnerable amounts to 15%. Access to social and economic infrastructure is poor.

It appears, however, that the villages along Rahad river are relatively better off due to their better organisation, infrastructure development and intensive support by the DNPP.

3.2 Livelihoods

There are five population groups and locations that can be distinguished according to their socio-economic characteristics and specific relationships with the Dinder National Park and use of its resources:

3.2.1 The Rahad River Villages

The Rahad River villages in Gedaref state comprise 38 outside the park (in the zone of influence) and 10 villages inside the park, 8 of which were included only after the extension of the park boundary in 1983.

Most parts of the population practice a combination of rain-fed subsistence farming and gerif cultivation or work as agricultural laborers. In the traditional rain-fed agriculture, a variety of crops are grown. Most of the cultivated area is put under sorghum as the main staple crop and sesame as the main cash crop. The productivity of the two crops is quite low.

Gerif land is the land that stretches along the riverbanks and from which floodwater recedes. It is quite productive since soil fertility is annually renewed by floodwater and has a high rate of water retention. Access to gerif land varies from village to village. Crops produced on this land are mostly high-value vegetables and fruits as well as beans. After harvest the gerif land is usually rented out to nomads. The crop residues are a valuable resource in the dry season for local and nomadic pastoralists.

The permanent residents keep limited numbers of domestic animals like sheep and goats. It is only the better off households who own cattle. Settled villagers generally keep their animals in their vicinity. Animals graze first on the natural pasture around the villages, and then they move into the traditional and mechanized rain-fed farms to feed on crop residues and sometimes they move into the Park.

Environmental Observation:

Situation inside the park: The ten villages which have been developed inside the park during the last forty years have exerted a considerable influence on the vegetation and wildlife in their zone of influence which extends approximately five kilometres into the park. These villages have developed rain fed agriculture up to two to three kilometres away from the river and beyond this area firewood is collected and livestock grazed to the extent that there is almost no tree cover and the field layer has been severely modified. Immediately along the river irrigated agriculture using water drawn from the channel aquifer has been established up to distances of about 100 metres from the channel. Fruit trees such as citrus and mango have also been established in this zone. The villagers recognise the park boundary and that they are using the resources of the national park and are prepared to negotiate agreements about how they can use these resources.

Situation outside the park: The villages established along the north bank of the river have a more limited direct impact on the park; however livestock from these villages regularly enter the park for grazing. These villages have converted the former forested rangeland to rain fed agriculture and have deforested these areas in order to supplement their incomes. Wood taken from these areas has not been used primarily for local consumption but has been exported to larger towns and cities. Further away from the river large scale mechanised farms have removed all trees from very large areas. The former grazing areas have completely disappeared. The park boundary is well understood although it appears that this is one of the main areas where pastoralists enter the park to graze cattle.

3.2.2 Sennar State Villages

There are about five villages in Sennar state along Dinder River in the North of the park. Umbakara village is closest to the park, situated about 12 km from the main entrance. People practice limited rain-fed agriculture around the villages and animal husbandry, but most inhabitants do not have access to land and work as seasonal labourers on the large scale mechanised farms. In some parts these farms occur all the way up to the park boundary with some evidence from satellite images that it has at times encroached on the park itself. The park boundary appears to be well respected since there seems to be relatively little deforestation extending into the park.

According to villagers discussed with in Umbaraga, some families have settled closer to the national park (ca. 3 km) to better make use of the park resources.

3.2.3 Magano Village

Since the extension of the park boundary in 1983, Magano village is located inside the park. Magano village is known to have existed already when the park was established. The population comprises four major tribes who practice a popular form of Islam. Historically, the village has enjoyed the right to use the park resources for its subsistence; The community of about 450 people at its Magano site practices subsistence agriculture growing rain fed Sorghum, Sesame and some vegetables close to the village as well as

keeping approximately 400 livestock in the form of sheep and goats. This has little impact on the natural resources of the park.

In the dry season, the Magano villagers move away from the homesteads to other places in then park with more water availability. They construct temporary huts during their stay near the main game post in the southeast part of the park. At the onset of the rainy season, they return to their village.

Their livelihood characteristics are:

- Rain-fed agriculture and small scale livestock rearing, in particular goats;
- Handicraft - rope making, production of beads;
- Casual labor on mechanised farms in Blue Nile State;
- Utilisation of other park resources: hunting of small animals for consumption; firewood collection; tree felling to increase land for cultivation.

3.2.4 Blue Nile State Villages

There are about 32 villages in the Blue Nile State which are close the western border of the national park. The villages in the north-west part are located 10 km and more outside the park and their impact is limited. In the south-west there are scattered villages in the Kadalú area including El Gerri village. Some of these villages came to be located close to the park and their field within the park when it was extended in 1983. The Kadalú villages do not accept the boundary of 1983 and therefore also do not accept the zoning and related restrictions. They only want to deal with the park authorities on the basis of the old boundary. For this reason the effective implementation of the extension has been postponed until recently when the park management made renewed efforts to gradually implement the extension in 2001, 2002 and 2004. This has been without success and the villagers continue unaltered to use their fields within the park.

As witnessed during the last visit in June, the resistance is very strong and is supported by local authorities. During the feed back meetings with Roseires Locality on potential FTP interventions, the CT was told that "We don't want any donors to come here if this implies taking our land" and the meeting had to be discontinued much before the planned end. These villages are under pressure from two sides: the mechanised farms whose expansion reduce available land for subsistence agricultural production and grazing and thereby threaten their livelihood; and at the same time the national park that has been extended and included some of their traditional land and restricted its use. Many inhabitants had to leave the area during the civil war

The livelihood of these villages is based on rainfed subsistence agriculture and animal husbandry. This is supplemented by agricultural labor in the mechanized rain fed schemes.

Dry season occupation comprises tree felling, firewood production and charcoal production, handicrafts, trading, and gum collection. Many of these activities happen inside the park.

The expansion of mechanised farming to the west of the park reduces land available for traditional subsistence farming and pasture which reinforces the tendency to utilise park resources.

3.2.5 Nomadic and transhumant pastoralists

In the Rahad River area, some of the villages are inhabited by semi-sedentary nomads who migrate with their herds in the rainy season but return in the dry season. Due to lack of pasture and water outside the park, they use the park for grazing. The park is also used by nomadic pastoralists from outside who migrate between Butana and the rangelands in Gadaref. They are forced to move further to the south because of expansion of large scale mechanised farming in their traditional grazing areas. It is estimated that the number of livestock trespassing Dinder national Park annually during the period January to June could amount to 900.000 cattle, 2.000.000 sheep and 500.000 camels³. According to meetings with the Pastoralists' Union in Gadaref, the livestock population in the Park surroundings could be between 5 and 10 million animals, mainly cattle and sheep.

The "the bulk of herds and thus the "nomadic problem" is concentrated on the east side/Gedaref side of the park although trespassing herders are also found in the Blue Nile State part. The root cause of nomads and semi-nomads trespassing the park boundary is the drastic reduction of grazing areas and animal routes outside the park due to extension of primarily planned and unplanned mechanized farming. This compels the nomads to resort to the park for fodder and water. In the 1950's about 86% of Gadaref State was rangeland and woodland, in 1991 rangeland was reduced to 6% and forests were reduced to 18% of the state area⁴.

The pastoralists and semi-nomads are currently the most vulnerable group. There is a certain understanding for the pastoralists' problems by stakeholders involved in the DNPP and Gedaref State has made an effort at rational land use planning to secure pastures and water supply for livestock. However, this has partly been obstructed by the strong and powerful organisation representing the mechanised farmers. As stated in the DNPP evaluation report:

"The past experience of the Gedaref state has shown that technical proposals for the most efficient and equitable land use planning are not scarce. What is at stake is the implementation of such proposals given the diverse and conflicting interests of various land users in a situation characterised by severe asymmetrical power relation. Such a situation requires careful handling and patience if an efficient and equitable land use planning is to materialise".

³ DNP Terminal Evaluation 2004.

⁴ Director of Pastures and Rangeland, Gadaref State.

3.3 Land Tenure and Access to Land

As already revealed above, access to land (and water) is the most critical social issue in this area. AS can be seen from the table below, in the villages in Rahad River and Sennar State, only a small proportion of the population has access to registered gerif land or gerif land within the park. Close to 60 % have access to rain fed customary land which is less productive and a rather large proportion of nearly 1/4 of the population are land less. The poorer parts with less access to land are those who use the park more frequently and are more dependent on the park for making a living.

Among the "landless" are also those nomads and pastoralists who have lost former grazing areas to traditional and large scale mechanised farms who also use the park resources in response to lack of opportunities outside the park.

Access to land in Rahad River and Sennar State villages

| <i>Type of land</i> | <i>Estimated % of Population</i> |
|------------------------------------|----------------------------------|
| Access to gerif land (registered) | 20 |
| Access to rainfed land (customary) | |
| • up to 15 feddans | 42 |
| • 16-30 feddans | 14 |
| No land* | 24 |

Source: HCENR socio-economic baseline survey 2001

* Some rent land from those who have access

To reduce the human impact on the park, the Interim Technical Report proposes a restructuring of the current land use and agricultural practices inside and outside the park. The idea is to decrease the areas under rain-fed agriculture to make room for pastures and to extend the irrigated land for production of high value crops through improved (water saving) irrigation systems and new crop varieties. This would require a major reallocation of land. This was discussed during the last visit of the CT in June. The response so far shows that it will be very difficult to convince those with access to gerif land to share and those with rain-fed and to reduce. In addition, it will be difficult to identify the "owners" of the land as most of the land is customary and therefore not registered (see discussion in chapter 4). So the FTP must make a major effort in designing a good and convincing demonstration pilot.

It has not yet been possible to fully shed light on the land issues in the Kadalou area. But basically households have some access to customary land for mixed small scale rain-fed agriculture and animal husbandry or rent land from the large scale mechanised farms. They supplement agriculture production with seasonal labour on these farms. They are squeezed between the extending large scale farms and the extended boundary of the park and without land title it is difficult for them to defend their right to use the land. This situation is exacerbated by the fact the Kadalou area has been affected by the civil war and many people had to flee. Upon returning, they realise that their land has disappeared.

This call for a political solution (see chapter 4) and without this the FTP can do little in terms of livelihood improvements and improved park management.

As Magano's impact on the park is limited, there is already an agreement that Magano village stays within the park so the villagers have access to the land they need. With year round water supply as proposed in the Technical Report, their movements to the core of the park could be avoided.

3.4 Gender and Vulnerable Groups

3.4.1 Women

It appears that the findings from Lower Atbara of women's low status and marginal role in agriculture to a certain degree also apply to the Dinder area. A case study published by ENTRO⁵ states the following:

"Organisation of labour within the household according to sex and specialisation is an important feature that affects resource use. In Southern and Western Sudan, women play a major role in agricultural activities and there are a large numbers of female headed households. This feature is not widely accepted in the areas along the Nile and some parts of central Sudan. There are certain activities that are left to women such as firewood collection or domestic activities, while men are more involved in land preparation, ploughing, weeding, gum tapping and collection".

Possibly due to the populations' in-migration from other areas, ethnic diversity, and possibly exposure to the DNPP, the CT has observed the following changes:

- Women are less "passive" as compared to Lower Atbara and all VDCs have female members - however women's participation in public life and decision making is still limited, especially with regard to women belonging to nomadic and pastoralist groups;
- Depending on the village, women may play a more prominent role in agricultural production while others may concentrate on domestic activities alone such as fuel wood collection, fetching water, food production. During DNPP, some women's groups have started joined vegetable production on irrigated land and would be interested in continuing this but would need more technical and managerial training.

Development options for women could be: Include women as separate target group for irrigated agriculture; reduce female work burden; and environmental education and awareness raising.

⁵ ENTRO/Y.A. Mohammed (2005): Watershed Management Project -Experience in Watershed Management. A case Study from Sudan with emphasis on Dinder national Park.

3.4.2 Nomadic Pastoralists

Like in Lower Atbara, also in and around the Dinder National Park nomadic and semi-nomadic pastoralists are among the most disadvantaged and vulnerable groups because of political biases and misconception and drastic reduction of their grazing areas. Further restrictions to their use of natural resources would result increased levels of impoverishment. As one of the solutions to the environmental problems of the park, the Technical Report has proposed a major restructuring of land use that would result in a rehabilitation of grazing areas and corridors which is to be tested and demonstrated in a pilot project. It is important that the demonstration project is planned and implemented with high levels of participation and consultation of nomadic and semi-nomadic population groups. This may require new - mobile - participatory approaches whereby project staff moves with these groups rather than asking them to participate in village meetings.

3.4.3 Landless

The landless men and women are also a vulnerable group as they solely depend on employment on large farms which only provides income for a short period. The landless are among the poorest people who use the park resources as their major coping strategy. They are therefore contributors to the environmental problems in and around the park. As most of the FTP proposals are land based there is a risk that this group is excluded. Therefore, the project also has to offer activities suitable for livelihood improvements of this group in the form of alternative income generation and environmental awareness raising to limit their dependency and use of the park.

Are the Magano People Indigenous People?

The population at Magano consists of a number of ethnic groups. Of these the Gumuz who have close kin in the adjacent area of Ethiopia might have been considered to be an indigenous people in the sense used in the World Bank Operational Policies.

In an African context "indigenous" means that people have social, economic and cultural customs and traditions that are different from the institutions of the country of which they form a part and from the national, social and cultural characteristics of the predominant parts of the population. Whether a group is indigenous or not can be asessed by asking four crucial questions/indicators⁶. The answers were obtained during an interview of the Magano community at their dry season location at Tabia on the Dinder river.

Indicator 1: Does the community identify itself as a member of a distinct indigenous cultural group and is this recognised by others? The Gumuz have relatives in Ethiopia, however they do not feel more closely associated with these Gumuz than with Sudanese.

Indicator 2: Is the community attached to geographically distinct habitats or ancestral territories and their natural resources? The village was established by immigrants to the area some time early in the 20th century following a period during which the land was largely vacant following the catastrophic drought of 1888.

Indicator 3: Do the communities have cultural, economic, social or political institutions that are separate from those of the dominant society and culture? All over Sudan there are cultural and ethnic variations but the Gumuz basically have "Sudanese" economic and political institutions and no institutions of their own.

⁶ World Bank Operational Policy and Guideline for Indigenous People.

These include the native administration, popular council, district council etc. The Gumuz have political representation in the district council in El Roseires. The village is led by a Sheikh and there is a popular committee and a women's group.

Indicator 4: Do they have a language of their own that is different from the official language of the country or are? Like the other ethnic groups in Sudan, the Ingessana have a vernacular of their own but speak Arabic.

The indicators show that the Magano population cannot be considered as an indigenous people. However the village does have serious problems which should be addressed. In particular the shortage of perennial water at their preferred location of Magano forces them into the centre of the park in search of water during the dry season. This splits the community in two since old women who are incapable of making the journey of some 30km, as well as young children are left to fend for themselves at Magano making use of the small amount of remaining water while the rest of the people move to Tabia. In addition many of the men leave the village and the park in order to seek seasonal employment in the agricultural schemes.

3.5 Local Stakeholder Interests

Dinder area has a multitude of stakeholders and a mushrooming CBO and CSO network. Major stakeholders are:

- NGOs: Sudanese Environment Conservation Society (DNPP partner); World Vision (Kadalu) and Practical Action;
- Village Development Committees and Women Groups formed under DNPP;
- Higher Committee for El Rahad River Area Village Development Committees;
- Kadalu People Development Committee;
- Traditional leadership structures ((including nazers, omdas and sheiks);
- Formal local government and village structure (e.g. village people's committees);
- Farmers' Union;
- Pastoralists' Union.

The pastoralists and semi-nomads are currently the most vulnerable group. Expanding mechanised farming around the park and in the rainy season pastures make it increasingly impossible for them to find pasture and water for their animals. As a last resort, they trespass into local farmers' fields or into the park leading to conflicts with local farmers and park staff. There is a certain understanding for the pastoralists' problems by stakeholders involved in the DNPP and Gedaref State has made an effort at rational land use planning to secure pastures and water supply for livestock. However, this has partly been sabotaged by the strong and powerful organisation representing the mechanised farmers. As stated in the DNPP evaluation report:

"The past experience of the Gedaref state has shown that technical proposals for the most efficient and equitable land use planning are not scarce. What is at stake is the implementation of such proposals given the diverse and conflicting interests of various land users in a situation characterised by severe asymmetrical power relation. Such a situation requires careful handling and patience if an efficient and equitable land use planning is to materialise".

There may also evolve an intensified conflict between the Kadalalu villages and the park authorities. These villages are under pressure from two sides: the mechanised farms whose expansion reduce available land for subsistence agricultural production and grazing and thereby threaten their livelihood; and at the same time the national park that has been extended and included some of their traditional land and restricted its use. The DNPP evaluation advises:

"In a situation where poverty is rampant and where the very survival of people is at stake the provision of opportunities for alternative livelihood options is crucial... We advise the future development assistance should focus on the people of Magano and Kadalalu to lift them up to the level of at least that of Rahad villages".

The CT was also informed that Farmers Unions and Pastoralist Unions lobby against the national park.

3.6 Experience with Participation

The communities in and around the park are fairly well organised due to DNPP. Apart from the popular committees and the traditional leadership, most of the villages have a Village development committee that serves clusters of villages. In the Rahad River area the village development committees have even formed an apex organisation for the effective representation of their interests. The chairman is a very enthusiastic and dynamic person whom the project preparation team has identified as "community champion" and it is suggested that the watershed project makes use of his competence and social capital. The committees and the population have been more or less successfully sensitised for the environmental concerns of the park and therefore understand the need to conserve the park also for their own sake. They have been exposed to participatory planning and implementation of watershed and livelihood improvement interventions. Although far from being self reliant and sustainable, there is a basic structure and therefore the watershed project need not start from scratch. The watershed project should build it on these structures - also to avoid proliferation and "organisation fatigue", but need to provide further capacity development support as the VDCs are not yet sustainable and many have become dormant after termination of DNPP and need to be revitalised.

DNPP cooperated with a number of national NGOs, primarily the Sudanese Environment Conservation Society, and taking into consideration the short time frame for implementation, the watershed project should make use of them as they are already familiar with the area and its communities. As during DNPP, their role should be to provide awareness raising and capacity building among communities and local government and parks staff and the communities and to facilitate conflict resolution, participatory planning and cooperative park management.

Should a decision been made to include the Blue Nile State villages in the Watershed Project, the "Kadalalu People Development Society" should be used as entry point. It is however suggested that due to the prevailing disagreement with regard to the park

boundary in this area, watershed activities focus on trust making, conflict management, and environmental awareness raising and as a minimum they should have representation in the below mentioned "Local Stakeholder Committee for Dinder National Park".

Transhumant pastoralists are represented by the VDCs as witnessed in the Rahad River area, but nomadic pastoralists are difficult to reach. They are to a certain degree represented by the "Pastoralist Union" and the Watershed Project should make use of the local representatives and facilitate their membership in the local "Local Stakeholder Committee for Dinder National Park" which will be established as proposed in the Dinder National Park Management Plan. The Committee is envisaged to include the DNP administration, village development committees, farmers' and pastoralists' unions, native administration representatives, representatives of the involved Localities and States.

4 Social Key Issues in Bau Locality

4.1 Population

Bau locality has a population of 100,000 people who are concentrated in and around Ingessana Hills. The majority of the population lives in bigger settlements like Bau, Dairang, Gam mine camp, Salbal, Maganza, as well as in smaller villages like Gugub, Taga, Gabanit and Soda. There are also isolated Ingessana households scattered along hill slopes. Agricultural production remains the area's most important sector, employing over 80% of the work force.

The Ingessana ethnic group makes 80-85% of the district's total population. The remaining sedentary population comprises a mixture of tribes from Western Sudan and Southern Sudan. In addition to the Ingessana people, the hills are populated by Dawala and Ragarig tribes who are involved in gold mining. Arab and Fulani nomadic groups are transient communities roaming southern Blue Nile with their cattle the year round. They settle in the Ingessana Hill temporarily during rainy season (June-October). Arabic language is spoken by all ethnic groups; however, each group has its vernacular.

Bau Locality and the other Localities in the State witness very high rates of population growth and mobility as compared to other regions due to in-migration of people from all over Sudan as IDPs (drought, famine, and war) and people in search of labour and other income generating activities, e.g. mining. At the same time, the civil war made many of the original inhabitants to leave temporarily. IDP villages are scattered all over the Blue Nile area. After the peace agreement some people have started to return to their original home villages but experience shows that most likely others will stay and settle permanently.

The living conditions of the local population have been hampered by the long-lasting civil war. The latest estimation indicates that 50% (2004) of the population live below the poverty line. According to CDF project documents, the figure is as high as 90%. For then same reason, access to social and economic services is very poor. During the rainy season the Locality is cut off as the connecting road becomes impassable as well as the internal

road network. Health and educational facilities are lacking or in deplorable states, and most villages lack safe water supply.

4.2 Livelihoods

4.2.1 Traditional farming and agricultural labour

The homogenous Ingessana communities around the mountains practice a mixture of agricultural production and animal husbandry. Most farms remain rain-fed, subsistence and susceptible to drought. They graze their cattle within their settlements where they also practice some crop production growing mostly sorghum, sesame, peanuts, and some vegetables.

The new IDP villages are mainly concentrated west of the hills. Some of these villages are ethnically homogeneous while others comprise a multitude of ethnic groups from various places in Sudan. They practice limited mixed agriculture and work as seasonal labourers on large scale mechanised farms.

Charcoal making is a major income generating activity and as a result the existing forests have been overexploited. Other income generating activities are Gum Arabic collection and collection of fruits from trees. Gold mining has lately also become an important income earning source (see below).

The lands within the hills (the horse shoe) and along the foot-hills are occupied by small scale farmers while the area further outside Ingessana Hills largely is under large to medium semi-mechanised and mechanized farms. The Hills are surrounded by 1 million feddans cropland of which only 1/5 is small scale agriculture whereas the rest is mechanised agriculture. Both the traditional farms and most of the mechanized farms report declining soil fertility and portions these farms go out of production every year.

Traditionally, small scale farmers combined crop cultivation and livestock rearing with minimum negative pressure on the natural environment. Over time however, population growth and expansion of semi-mechanized and large scale mechanised farms have disrupted this traditional shifting cultivation resulting in shortening or lack of fallow periods and thereby decline in crop yields. The farmers reported that this constant expansion of semi-mechanized farms has put too much pressure on the land through removal of vegetation normally used as grazing resources.

Farm activities are generally performed by family labour. Land preparation is carried out by hoe and weeding is also done using traditional implements. Occasionally, families may organize “Nifir” for land preparation provided the family can afford to provide food and drink to the participating individuals. When this is the case, larger area can be cultivated. Weeding and other farm activities are performed only by family members.

4.2.2 Medium and large scale mechanised farming

The area around the hills is characterised by medium size semi-mechanised farming and the lowlands are characterised by the expansion of mechanized rain-fed agricultural farms. Both types are usually associated with absentee landownership. This is the most important factor for the deterioration of the natural resource base, adversely affecting grazing and traditional farming lands. Pressure on both pastoralists and small farmers increased with the expansion of commercial mechanized farming which started in the 1970's. The area experienced large scale extraction of timber and mineral resources and the encroachment of giant, northern-owned commercial mechanized farming schemes on the fertile lowlands around the Ingessana Hills. The Ingessana Hills were encircled. Vast areas of savannah woodland formerly used by the Ingessana people for shifting cultivation were seized and cleared of tree cover. Population pressure also increased, since the new schemes needed manpower, and migrant labourers were drawn to the area in search of work. Later, war-displaced people were relocated there in government villagization projects in order to work on the privately owned schemes. Finally, in the 1980's the area became directly affected by the civil war and continued until the recent peace agreement and is now affected by returning refugees.

4.2.3 Nomadic pastoralism

During the period 1984 to 2003, the forest and rangeland are in Bau Locality was reduced to one-third of the former area to give way to commercial or subsistence cropland. Croplands now surround the Ingessana Hills. The remaining tree cover is mostly limited to the Ingessana Hills and a few stretches west of Bau locality. Rangelands are few and livestock mostly graze on crops residues. About 1.5 million heads of cattle, 3 million sheep and 266 thousand heads of goats from the Blue Nile State graze in Bau locality at one time of the year. In addition, many nomads with their cattle from the White Nile and Sennar States cross Bau locality in their seasonal migration between the too dry winters in the north and the too muddy and biting flies infested summers in the south. Four migration routes cross-cut Bau locality, three west of Ingessana Hills and one east of it. Cattle on these migration routes may encroach on croplands causing conflicts between herders and farmers.

4.2.4 Gold miners

In the Ingessana Hills, artisanal gold mining was not known until the mid 1990s. Dawala ethnic group of Kurmuk locality are the most skilled artisanal gold miners. To make a living, Dawala started prospecting for gold around their new home in the Ingessana Hills area. In 1996, they discovered gold in quartz veins around Gugub village. Soon they started artisanal gold mining along the stream terraces as well as on quartz vein slopes. Through interaction with the new-comers, the Ingessana tribesmen acquired the new artisanal gold mining skills and for the first time ever, the semi-pristine community has experienced direct and extended contacts with outsiders. The social change as it appears, is tremendous on the community.

Artisanal gold miners in the Ingessana Hills are concentrating in Gugub, Taga, and Salbal villages. Gugub village has the largest population of about 1000 of which Dawala ethnic group make about 80% of the population. The rest of the community is represented by the Ingessana. In contrast, about 70% of the 300 artisanal gold miners in Taga village located 5 km east of Gugub are from the Ingessana ethnic group.

The gold miners use traditional methods which cause substantial damage to the environment (digging of holes, tree felling) and to human health (mercury for amalgamation, water pollution). A number of social problems also arise with the rapid and unpredictable growth of gold panning, including land-use conflicts between migrant gold panners and local resident communities, the use of child labour, poor health and sanitation conditions, the migration of men in particular for long periods thus placing mining in competition for labour with food production, with increased risks of the spread of HIV/AIDS. On the other hand, it is important to recognise that if undertaken in an appropriately controlled and responsible way, alluvial gold panning (as well as other small- and larger-scale mining) can make an important contribution to economic and social development.

4.3 Land Tenure and Access to Land

It has not been possible to obtain exact figures on land ownership and access to land. Meetings with villagers in the different parts of Bau Locality indicate the following situation:

The Ingessana villages that are concentrated around the foot hills use customary land that is limited to about 7 km around the villages. Taking into consideration population increases as reported to the CT by local inhabitants this land is not enough to ensure households' livelihoods. Household plots have become fragmented and some households have no access to land. In the newly created IDP villages in the west, a substantial number of people are landless and work on the large scale mechanised farms which only provide employment for 2 months a year. Others have access to rain-fed farms whose extension is limited by the surrounding large scale mechanised farms. Large scale mechanised farms belong to outsiders and land holding usually exceed 1000 feddans⁷. While most of these farms are registered, the number of unregistered farms is substantial. Land in the hills is freely accessible. Already now, the non-Ingessana share of gold miners is substantial and if this trend continues may create conflicts between the different user groups which so far have coexisted peacefully.

Some of the proposed FTP interventions such as such as support to rehabilitation and improvement of cattle routes require rational land use planning and land re-allocation. This may be hampered in view of prevailing land tenure uncertainties, lack of a land use policy and ambiguous land allocation procedures in Bau Locality (as elsewhere in Sudan). They are rooted in the existence of two parallel and partly contradicting land tenure systems - statutory law on the one hand and customary law on the other.

⁷ According to one of those farmers an interview in Ed Damazin in June.

According to statutory law⁸ all unregistered land (including customary land which is unregistered land) is owned by the government and can be made available by the government for any public purpose. This has been the basis for making land available for investments in the ever expanding large scale mechanized farming which for long has been seen by the government to be the major path to development in Sudan.

Customary land tenure, in contrast, has been practiced since time immemorial. Although weakened in the 1970's, it was reconfirmed through several bills and acts in subsequent years :

"...Local institutions, mainly relying on customary norms and practices, have (traditionally) managed land and natural resources in Sudan. Pre-independence administrations have relied heavily on the services of these institutions, at no or marginal cost to the state. Over the last 35 years legitimate local customary handling of land management has been strongly influenced by the state. One major consequence of the government interventions since 1970 is that customary rights have become very precarious and vulnerable in law. Rural communities do enjoy usufruct rights, but without any real tenure security". However, it would be wrong to conclude that the impact of this legislation on holders of non-registered land rights, i.e. a vast majority of the rural population, is completely at the will of government. "There are already signs of defiance to the customary rights by people themselves, not by the government. Some people, especially these who have grievances against others on the basis of historic land occupation, rely on the legal position that unregistered land belongs to the government land in order to claim access to land and natural resources that have been occupied, used and managed by others since time immemorial. The argument that 'no one has a better title than the others' on government land is the mechanism used for this purpose"⁹ .

In Bau Locality, these land tenure uncertainties have resulted in skewed access to land and natural resources by different land user groups and have resulted in a multitude of conflicts between small scale rain fed farmers, nomadic and transhumant pastoralists and large scale mechanized farmers.

- Small scale rain fed farmers in the Ingessana Foot Hills who are the traditional inhabitants of the area, live in villages whose customary land has been limited to an area of about 7 km around the villages by the traditional leaders (?). This distance has been adjusted over time (4, 8, 6, 7 km) and has apparently been devised primarily to protect the villages from land grabbing by the expanding large scale mechanized farms. The land allocated to the villages is generally considered to be too small to secure households livelihoods and does not consider demographic changes resulting from household increases, in-migration of IDPs and other settlers etc.

⁸ Since the enactment of the Unregistered Land Act in 1970.

⁹ FAO: Project Document for Technical Support to the Establishment and Functioning of the National Land Commission, 2005 to 2007.

Many villagers have become labourers on the mechanized farms or have been attracted to the area because of available work on these farms. Income generation is however limited to two to three months during harvest season as the major work is done by a few permanent employees.

- At the same time, the land tenure uncertainties have resulted in drastically reduced livelihood conditions for nomadic and transhumant pastoralists. Rain fed farming (both small scale and large scale) has encroached on grazing areas and blocked watering points, and pastoral routes and corridors in the farming areas were narrowed to an unsustainable width. Under these circumstances it is hardly avoidable that herds enter the fields and destroy crops, leading to arguments about compensation payments and physical violence.
- Large scale mechanized farm operators, in turn, consider themselves the "lawful" users of the land and see pastoralists - despite of their customary land right - as the "lawless" intruders who can either be evicted from the area or held responsible for damages done to their crop. Pastoralists were also mentioned to be the reason why large scale farmers do not comply with their obligation to reserve 10% of their area for trees. Tree planting is not attractive as the herds either trample or eat the newly planted trees or they are destroyed by fires which are purposely set by pastoralists to make fresh grass grow.

In this situation it is difficult to select sustainable fast track watershed activities that are beneficial for as many population groups as possible. Rehabilitation of animal routes for example would require additional land which is currently not easily available as it is occupied by others. Such interventions also have a regional perspective which is outside the scope of the fast track watershed project. Animal routes traverse several localities and states which must be addressed concurrently to avoid bottlenecks. Likewise, provision of haffirs and dams - if only built close to villages - would basically exclude benefits for pastoralists.

It appears that a major precondition for the fast track watershed projects is a land tenure reform to strengthen customary rights (e.g. through registration) and the introduction of a land use policy by the government that recognises realities on the ground. For Blue Nile State, a solution may come from the Comprehensive Peace Agreement which has addressed land tenure uncertainties and their solutions as a major precondition for peace. As a result and in accordance with the Interim Constitution of 2005, a National Land Commission (NLC) is in the process of being established, awaiting the approval of the National Land Commission Bill. Together with the Southern Sudan Land Commission and the South Kordofan and Blue Nile State Land Commissions the NLC will have the powers to:

- Receive and address land claims; and
- Advise the governments on land tenure reform and land use policy and law development.

Provided that Blue Nile State Commission starts operating in the near future it could be instrumental for the customary land claims and land reallocations necessary for the different proposed fast track watershed interventions.

4.4 Gender and Vulnerable Groups

The general situation of women is similar to the one prevailing in the other project areas with regards to cultural, social and religious norms. In contrast to the other two project areas, the work load on women seems to be higher. The women carry water and fuel wood long distances by head load. It is regarded a shame for men to carry water although boys are involved in this task, using donkeys for transport. Women are also heavily involved in agricultural activities, not only in subsistence farming but also in cash production and seem to play an important role in tobacco farming.

A case study on migration in Bau Locality¹⁰ found that the above mentioned conditions are due to the out-migration of men in search of labour and other income generating activities or because of the civil war. This has not only increased women's work burden and involvement in agricultural subsistence and cash crop production but also brought a certain level of empowerment as women to a higher degree are involved in domestic and public decision making and have access to income.

Due to their active role in agricultural production, the fast track project should address women as a target group for improved agricultural practices and also support interventions to reduce their domestic workload through improved water supply and firewood/charcoal replacing energy while concurrently strengthen their role in decision making.

4.4.1 Nomadic Pastoralism

Nomadic pastoralists are among the most vulnerable groups and their dilemma has been described in the section above. Unless care is taken, the FTP may reproduce prevailing biases and misconceptions and ways should be found to address the needs of these groups although it seems premature to address the basic problem of reduced and degraded pastures and corridors. Important avenues would be mobile approaches to participatory planning and cooperation and communication through the traditional leadership system which is their preferred form of representation.

4.4.2 Landless population groups

As in the case of Dinder, Bau Locality has a group of landless people who are vulnerable as they primarily depend on seasonal employment on large farms and who resort to environmentally damaging natural resource use to cope with their precarious

¹⁰ Karama, Tuhfa T.O.: Male Migration and Changes of Women's Role in Rural Settlements. Bau Locality Case Study, Ahfad University, 2007.

situation through tree cutting and charcoal making. Forestry sub-projects would be relevant and suitable for this group.

Are the Ingessana an indigenous people?

The Ingessana are the original people of Bau Locality and until independence they have lived rather isolated. They make 80 to 85% of the total population in the Locality and other ethnic groups comprise a mix of sedentary groups from all over Sudan as well as nomadic groups who are transient communities. Due to their historical isolation and specific situation of being squeezed between north and south, the question has arisen whether the Ingessana are to be considered an indigenous people.

A definition of "indigenouness" is used that is adapted to an African context in which it means having a culture and economic resource base that is very different from the surrounding population. This could be assessed by using the following four indicators "indicators":

Indicator 1: Does the community identify itself as a member of a distinct indigenous cultural group and is this recognised by others? The Ingessana perceive themselves as a distinct ethnic group in line with what is the case elsewhere in Sudan.

Indicator 2: Is the community attached to geographically distinct habitats or ancestral territories and their natural resources? The Ingessana came fairly recently to the area and share the area with other ethnic groups. The Ingessana constitute the majority.

Indicator 3: Do the communities have cultural, economic, social or political institutions that are separate from those of the dominant society and culture? All over Sudan there are cultural and ethnic variations but the Ingessana basically have Sudanese economic and political institutions and not institutions of their own (the native administration, popular council, district council etc.). The divide is not over indigenous or Sudanese affiliation but about north or south affiliation.

Indicator 4: Do they have a language of their own that is different from the official language of the country or are? Like the other ethnic groups in the Locality, the Ingessana have a vernacular of their own but speak Arabic.

According to the indicators above, the Ingessana people are not an indigenous people. However, the Ingessana feel deprived in view of land scarcity caused by extension of large scale mechanised farming and uncertain customary land tenure which requires careful handling to avoid further marginalisation and exclusion. E.g. the UNIDO global mercury project has made the Ingessana the primary target group to increase social cohesion among them and avoid land grabbing by other groups and outsiders.

4.5 Stakeholder Interests

Major stakeholders are:

- Community-based organisations if they exist at all (e.g. water committees formed under the UNIDEF WSS project) are extremely weak and require capacity building and training;
- Women groups exist (are also extremely weak and require awareness raising, capacity building, and training);
- The Blue Nile Net for Developing Organisations – an umbrella organisation for NGOs;
- Traditional leadership structures (including nazers, omdas and sheiks);
- Formal local government and village structure (e.g. village people's committees);

- Farmers' Union representing traditional farmers, large scale mechanised farmers, Gum Arabic producers, and agricultural companies;
- Pastoralists' Union representing different pastoralist groups

The area is regarded as one of the three disputed areas where development is seen a prerequisite for sustained peace. The Blue Nile State is considered as one of the less developed areas that deserves especial attention according to the Comprehensive Peace Agreement (CPA), and the Joint Assessment Mission (JAM) report of the UN/Sudan Gov/SPLM.

The main competitions and tensions between various local stakeholders are over natural resources, primarily land, along livelihood systems and not along ethnicity lines. The situation is highly explosive as witnessed by the CT during several field visits. The pressure on land is primarily caused by the expansion of large scale mechanised farming has created tension and conflicts between herders and small scale farmers and among herders themselves. There are also tensions and conflicts between the investors in mechanized farming and the other groups including herders and small farmers. Competition for natural resources is reinforced by the effects of the civil war. Public life is highly politicised and the political/party divide: SPLM versus National Congress Party cuts across all government structures and interest organisations. It will be difficult for the FTP to operate independently and without political interference.

As in the other project areas, farmers and pastoralist unions tend to represent the interest of the more affluent and powerful members, whereas small scale farmers and nomadic pastoralists are disfavoured. They feel better represented by the traditional administrative system which appears to be strong and vivid in Bau Locality.

4.6 Experience with Participation

Until the 1970's Bau locality has been historically isolated with little exposure to the outside world and received little development support. This tendency has been exacerbated by the civil war which has affected the area between the 1980's end the recent peace agreement. Bau Locality Administration merely exists on paper as Locality staff resides in Damazin and only pay occasional visits to the area. This also contributes to the marginalization of Bau locality. As one of the consequences, local organizational and community based structures have hardly been developed. All villages have popular committees with a number of sub-committees and government initiated women's committees. In some villages that were supported by UNICEF to develop water supply and sanitation, village water and sanitation committees exist. However, during field visits the consultancy team learnt that these organisations are generally weak or not functioning at all.

In contrast, the traditional leadership system - also called native administration - appears to be vital and generally respected by the population and the political actors alike. Bau locality is sub-divided in nine Omdias that cut across the three Administrative Units, the

lowest level of the Local Government system. Each Omdia is headed by an Omda who is responsible for the villages within this area. The villages in turn are headed by sheiks who refer to the Omda. Together they take major decisions concerning the areas and villages under their mandate. Among pastoralist they have administrative, judicial and security powers - but no power over pastoral land which is considered unregistered waste land owned by the government. In sedentary villages the Sheiks have administrative and security powers and are the custodians of the customary land rights of their respective community. It also appears that the traditional leadership system is preferred to Pastoralist Unions and Farmer Unions which are not considered to be true representatives of the interests of (poorer) pastoralists and small scale farmers.

Due to the reasons mentioned above only few NGOs operate in Bau locality and with limited presence on the ground as most NGOs offices are located in Damazin. Among the NGOs, Practical Action and World Vision with whom meetings were conducted appear to be the most suitable cooperation partners as they work within the same sectors as the fast track watershed project including participatory and gender sensitive approaches to livelihood improvements, improved and appropriate agricultural practices and environmental conservation.

For the fast track watershed project the above described organisational landscape implies that a major effort must be made to form CBOs from scratch and to develop the capacity at community and Locality level to carry out participatory planning and implementation of livelihood improvement activities before any meaningful investments can be made. The NGOs working in the area will have to play a major role in this process as they are the only stakeholders with appropriate experience and competence and appear neutral. At the same time the traditional leaders must be integrated as much as possible due to their credibility among the local communities and the important roles they play in regulating community affairs.

5 Implications for Project Design

5.1 Summary of Key Social and Conflict Issues

The basic social environment in which the FTP will have to operate is summarised for the three areas as follows:

5.1.1 Atbara

The expansion of large scale mechanised farming has been limited in Lower Atbara and is confined to the areas around Atbara and Ed Damer. Competition for land between the different land user groups is less pronounced. Land fragmentation along the river, however, is a concern as the land is insufficient to provide secure livelihoods. Land fragmentation is partly compensated by traditional family and neighborhood support systems or increased out-migration of the younger population and seasonal work migration. The Technical Report has proposed to address this issue by more effective

utilisation of the land and water through intensification and diversification of crop production, water saving technologies and productive tree planting.

Nomads and pastoralists have access to routes, grazing areas and water points - they are not blocked as in the other two project areas - and they have access to fields after harvest for animal grazing on crop residues. The issue in Atbara is rather that communal land due to desertification and sand encroachment cannot support pastoral livelihoods anymore. As discussed in the Technical Report animal density in the area appears to be above the level that could be sustainably supported by the environment. It also appears that the movement between Butana and Lower Atbara has been distorted by degraded pastures and lack water points so that only richer nomads move annually as they can afford to transport their animals by truck.

Farmers along the Atbara River are increasingly investing in livestock as a coping strategy against uncertainties in agricultural production. Livestock is integrated in irrigated agriculture and makes a significant proportion of farmers' incomes in the area. The keeping of animals, mostly sheep and goats, is primarily done by women. This change may, however, in the future, become a source of conflict between farmers and nomadic herders due to accelerated competition for crop residues, pastures and water points.

It is suggested that the nomads that would like to settle and that could accept reducing the number of cattle should be encouraged.

Despite of its unfavourable natural conditions, Lower Atbara stands as the most promising of the three project areas due to the absence of the social conflict witnessed in Dinder and Bau and because of it has lately attracted a number of investments in a drinking water supply scheme and an electrification scheme that could trigger economic development. Urban-rural interchange is also more pronounced in Atbara than in Bau and Dinder.

5.1.2 Dinder

To reduce the human impact on the park in the Rahad River area, the technical report proposes a restructuring of the current land use and agricultural practices inside and outside the park. The idea is to reduce the areas with rain fed agriculture to make room for pastures and extension of irrigated land for production of high value crops through improved irrigation systems and new crop varieties. This would require a major reallocation of land.

While the park boundary is basically accepted by the population and there is a certain willingness to negotiate the use of park resources, the issue of reallocation and restructuring of current land is met with strong resistance which is among others reflected in the phrase "what happens with the land if the project fails". From the field visit it appears that it will be very difficult to convince those with access to gerif land to share with others and those with rain fed land to reduce the area under cultivation. It will be

crucial for the FTP to design a good and convincing pilot project in a limited area to demonstrate the relevance and effectiveness of the approach. In response to their objections, land users volunteering would have to be given a certain security for their land.

As far as the Kadalú villages are concerned, unless a political solution is found, the FTP can do little in terms of livelihood improvements and improved park management on that side of the park. An option could be to intensify dialogue and conflict mitigation by neutral staff/a neutral organisation and as a minimum village and Locality representatives should be included in the "Local Stakeholder Committee for Dinder National Park", whose establishment is foreseen in the park management plan.

5.1.3 Ingessana

Bau Locality is among the poorest regions in Sudan, where tensions and conflicts over land are recurrent. The social structure is very heterogeneous, and the customary institutions weakened by decades of civil wars. Allocation of land for semi-mechanized and large scale mechanised farming to the detriment of small scale farmers and nomadic pastoralist is the main origin of the conflicts. The results are blocking of traditional seasonal migration routes and pastures. Small scale farmers can no longer practice shifting agriculture and population increases in households and villages can no longer be met by bringing new customary land under production. Competition for natural resources is reinforced by the effects of the civil war. Public life is highly politicised and the political/party divide: SPLM versus National Congress Party cuts across all government structures and interest organisations. It will be difficult for the FTP to operate independently and without political interference and the role of - neutral - NGOs rather than local government would be crucial for project implementation.

To avoid reproducing these biases and exclusion of nomadic pastoralists from project benefits, the fast track projects should address them as one of the target groups. Unfortunately, most efforts to deal with "pastoral problems" would involve some kind of restructuring of the land use pattern and re-allocation of land allocation and would run into the question of land tenure and the need to register customary land which goes beyond the scope and time frame of the FTP. Rehabilitation of animal routes in Bau for example would require additional land which is currently not easily available as it is occupied by others. Such interventions also have a regional perspective as animal routes traverse several localities and states which must be addressed concurrently to avoid bottlenecks.

5.2 Implications for the Participatory Approach

The CT's Interim Technical Report outlines the community initiated project interventions (sub-projects/small scale investments) that are eligible under the IWRM umbrella for the three projects areas. For the sake of sustainability and relevance for the communities, the sub-projects will be planned and implemented in a participatory manner by the beneficiaries themselves as introduced in the Institutional Report.

The basic elements of the participatory approach to be employed by the FTP are outlined in the box below.

Basic elements of the participatory approach

The approach for IWRM sub-projects planning and implementation will be based on the principles of beneficiary participation and community based initiative; gender mainstreaming; and support to decentralisation.

Localities are the core institutions of the local government system and are overall responsible for development in their area. The FTP will be a part of this responsibility. As Localities' managerial capacity and skills and experience in participatory planning are limited, they will be supported by temporary project implementation units as well as suitable NGOs who will provide professional staff with the required managerial, technical and social facilitation expertise. If need arises, additional external assistance will be availed from research and education institutions and consultancy companies.

Communities and project sites will be selected in accordance with agreed selection criteria. The Localities will assume responsibility to inform, mobilise, train and facilitate these communities and their community organisations to assess and prioritise their development needs (of men and women separately) and subsequently to formulate participatory action plans and sub-projects. To this end they will cooperate closely with the Popular Committees and the native administration.

Approval of plans and sub-projects will be based on a set of agreed eligibility criteria. Upon approval, the Localities will assume responsibility for implementation and supervision, disburse and manage sub-project funds, and contract goods and services from the private sector or NGOs. The Localities will also monitor progress of achievements of set targets (progress monitoring) and of the social targets and compliance with agreed project modalities (process monitoring of the participatory approach and gender mainstreaming). Likewise, they will carry out quality assurance of the implemented sub-projects, e.g. if technical and environmental standards have been observed.

The role of communities during implementation will be to support Localities in their implementation tasks, provide labour and local materials and participate in supervision and monitoring. After implementation the communities will be responsible for operation and maintenance of created community assets and mobilise necessary user fees, e.g. water fees, licenses for utilisation of forest products etc.

Throughout the entire process gender equality will be promoted and mechanisms will be devised to ensure that women and other vulnerable groups participate in decision making processes and share in the benefits of the IWRM sub-projects.

The findings and lessons learnt presented in this report and the experience of other projects such as ADS, DNPP etc., have some implications for the FTP's participatory approach:

- In the area around Dinder National Park and Bau Locality, there is a considerable potential for social and political conflict due to competition for land and water resources between different land user groups and the political divide caused by the civil war. It is therefore important that FTP selection criteria and processes are as transparent as possible and based on local consent. The criteria for the selection of potential project sites and communities proposed in the Technical Report should be reconfirmed with local stakeholders and beneficiaries and if possible readjusted. One of the first activities to be conducted in the initial phase of the FTP should be an information campaign to introduce the objectives and modalities of the project and most importantly to introduce the selection criteria and the rationale behind.
- For the same reason, the FTP has to be prepared to deal with and mediate conflicts. Some of the staff, preferably the social facilitator, should have skills in conflict management and conflict resolution and if necessary should be trained in the use of relevant tools. The social facilitator would have to play an important role in enabling the dialogue and mediate e.g. between the Kadalou People Development Committee and the park management staff. Should the "Dinder Park Local Stakeholder Committee" be established, it would be the key body for conflict management and resolution and the social facilitator should be able to support the committee in its work.
- Due to Localities' poor managerial capacity and skills and experience in participatory planning, during the initial phase of the project implementation, substantial time and effort must be reserved for training of Locality officers and extension staff by NGOs and private sector in the following subjects: (i) participatory planning and participatory communication tools such as focus groups discussions and various PRA techniques for participatory problem identification, analysis and prioritisation, and development of sub-projects and action plans, and (ii) the concepts of gender mainstreaming, gender equality and gender analysis during needs assessment, planning and monitoring.
- In view of the fact that in Bau Locality illiteracy is rampant and communities have not yet been exposed to bottom up development planning and gender mainstreaming, in the initial phase considerable time and effort should be invested to establish and train CBOs and sub-committees to develop basic understanding of the project philosophy and the skills necessary to fulfil their role in the FTP. Women need separate organisational channels to be able to voice their interests and concerns and the FTP should accommodate this.
- In Lower Atbara and Dinder National Park, the FTP will most likely build on the already existing organisations of village development committees and women's groups established through ADS, SOS Sahel and the DNPP. As noted through the

field visits, not all of these organisations are operational or adequately represent the different sections of the communities. During the initial phase of the FTP an assessment should be conducted of their representativity and performance and if necessary they should be re-elected. Existing as well as new community based organisations would require comprehensive sensitisation and (re-)training in community based development and participatory approaches; gender equality; and managerial skills including financial management, business training, operation and maintenance, how to run an organisation etc.

- To the extent possible, training and meetings should be conducted in the villages and not outside to ensure that women and vulnerable groups can participate.
- In view of the mobile lifestyle of nomadic pastoralists, participatory approaches would have to be adjusted to this. This may require that facilitators temporarily move with these groups rather than asking them to participate in village meetings - in line with the idea of mobile schools. Nomadic pastoralists don't have popular committees and village development committees but are more than others groups linked to and represented through the traditional administrative system which should be used as channel for communication.
- Field visits have revealed that the notion of O&M (operation and maintenance) is not well understood and practised. The CT has seen many water points and pumps in disrepair because they are not properly operated and maintained. Therefore, the FTP should from the very beginning promote O&M and train selected community representatives in the technical and managerial aspects of O&M of community assets constructed or rehabilitated under the FTP. In the case of assets that primarily benefit women, female caretakers should be supported.

5.3 Eligible Sub-projects

- In view of women's limited role in agricultural production in two of the project areas, the FTP sub-projects may have to go beyond the narrow realm of IWRM activities and for example address women's domestic work burden, for example through drinking water supply and intermediate means of transport (e.g. donkeys and carts). This could be a motivating factor for women to develop an interest in other activities such a tree nurseries, joint forest management, environmental training etc. where benefits are less direct.
- As most of the FTP sub-project proposals target "land based" beneficiary groups, there is a risk that the landless people will be excluded. Therefore, the FTP also has to offer relevant and suitable activities to improve the livelihood of this group to limit their dependency and use of natural resources (charcoal, wood cutting, park resources). The proposed forestry sub-projects could be a suitable entry point but activities that have a more direct benefit should also be promoted.

5.4 Proposed Selection Criteria

5.4.1 Atbara

The specific selection criteria for the Lower Atbara proposed are:

- Extent of linkage between watershed degradation and prevailing livelihood practices.
- Extent of vulnerability/ resource dependency
- Importance/Influence
- Extent of willingness of the target groups to participate (i.e. those with present unsustainable livelihood practices should be committed to the called upon process of change).
- Extent of institutional capacity to support and implement projects at State and Locality levels.
- Extent of previous exposure to development support
- Extent of development potential for alternative livelihoods
- Extent and probability of external risks

5.4.2 Dinder

The specific selection criteria for the Dinder Area proposed are:

- Potential Impact of Area on availability of Pastoralist Resources outside the park.
- Previous exposure to development support
- Relationship between park staff and population
- Distance to park boundary or extent of trespassing from the community/group
- Capacity of Village Development Committees and CBOs
- Number of inhabitants/population density
- Diversity of population (ethnic groups, land users, sedentary and nomadic pastoralists etc)
- Degree of degradation
- Accessibility i.e. likelihood of project activities to be operational during all seasons

5.4.3 Bau Locality

The specific selection criteria for the Bau Locality /Ingessana area are proposed to be:

- Extent of linkage between watershed degradation and prevailing livelihood practices.
- Extent of vulnerability/ resource dependency
- Importance/Influence
- Extent of willingness of the target groups to participate (i.e. those with present unsustainable livelihood practices should be committed to the called upon process of change).
- Extent of institutional capacity to support and implement projects at State and Locality levels.
- Extent of previous exposure to development support
- Extent of development potential for alternative livelihoods
- Extent and probability of external risks

Each criterion should be assigned a value between -2- to +2. In case any criteria receive -2, the area will be deselected. Land tenure aspects are to be considered under external risks.

6 Environmental Analysis

6.1 Atbara Environmental Key Issues

6.1.1 Changes in river flow regime

Before the building of the Khasm al Girba Dam higher up the Atbara river the behaviour of the lower Atbara was less predictable and much more variable than is the case now. Specifically the river used to flood annually to a much higher level than is now the case with the controlled release of water from the Dam at particular dates and for a given duration each year. Extreme floods were generally of shorter duration but of greater water levels than nowadays. As a result the river would often flood to a distance of up to 10 km from the main river course on each side of the river. Now the maximum flood extent appears to be only 1 to 2 km from the river and then only in some places. These changes in the flood regime have significant effects on agriculture and on natural vegetation. In particular the area that is capable of supporting flood recession farming is much reduced. The water balance of trees is affected since flood water no longer enters the soil and ephemeral vegetation such as grasses for grazing will no longer germinate and grow in areas which are not wetted by the flood. It should be borne in mind that eyewitness accounts of the previous situation, particularly in highly politicised situations may not always be accurate (Boersma 2004). Thus the former extent of the forest and the amount of field layer vegetation may not have been as high as stated by those with memories stretching back more than 40 years.

6.1.2 Changes in agricultural practice

In the past flood recession agriculture was practiced over almost the entire area flooded by the river at its peak. This was able to support a much higher population along the river than the current one. As a result of the loss of this agricultural land people turned to other ways of making a living including cutting trees for the sale of firewood. This has resulted in almost the entire tree cover of the much more extensive forests on both sides of the river being lost. Forests are now restricted to small areas of natural and planted forest on both sides of the river and these fall within forest reserves which are the responsibility of the Forest National Corporation. There is little chance of re-establishing forest on the former flooded area since the hydrological regime has changed and will no longer support tree growth. In any case the concentration of large numbers of people practicing agriculture in a very narrow riparian zone means that almost all of the native biodiversity has been eliminated with the exception perhaps of that occurring in the forest reserves. The bird fauna of the riverine agricultural zone while diverse is certainly not natural for the area since it consists of a large number of species which are strongly associated with farmlands elsewhere, often as agricultural pests.

6.1.3 Livestock

Since the area is semi arid with rainfall of only 100-150mm per year the grazing productivity is very low in areas that are not subject to flooding by the river or along Khors. Previously when the area was flooded to higher levels the flood plain would have produced far more palatable vegetation than is now the case. As a result of this reduction in area as well as a result of the increase in the size of the herds the area is now subject to grazing pressure far in excess of its sustainable capacity. This very high density of livestock has had a very great impact on the vegetation with the result that there is now almost no cover of perennial grassy species in the flooded zone. (Since there were no rains or floods during the time of our visit it was not possible to establish if there are still adequate seed banks of the annual grasses.

6.1.4 Invasion of weeds

The area close to the river has become invaded by a number weed species both indigenous and exotic as a result of past disturbance. These include areas of *Prosopis* sp. *Ricinus communis* and others. Where these weeds have become established at high density the native biodiversity has been largely eliminated

6.1.5 Traffic

There are few properly constructed roads in the region with the result that cars pass anywhere over the desert floor. This results in the destabilising of the surface and under the high prevailing winds sands are released and become mobile to form dunes in many places. The figure below shows the effect of traffic over the desert floor close to Gos al Halet. In the past this is likely to have been less of a problem since local witnesses claim that the field layer vegetation cover of the area was much more extensive than is now the case and this would have helped to hold the sand in place.

Figure 1 Aerial Image of Desert close to Gos al Halet showing multiple tracks and wind blown sand originating from the disturbed areas



6.2 Dinder Environmental Key Issues

6.2.1 Situation inside the park

6.2.1.1 Rahad River Villages

The ten villages which have been developed inside the park during the last forty years have exerted a considerable influence on the vegetation and wildlife in their zone of influence which extends approximately five kilometres into the park. These villages have developed rain fed agriculture up to two to three kilometres away from the river and beyond that up to the limit of their agreed influence firewood collection and livestock grazing have so influenced the vegetation cover that there is almost no tree cover and the field layer has been severely modified. Immediately along the river irrigated agriculture using water drawn from the channel aquifer has been established up to distances of about 100 metres from the channel. Fruit trees such as citrus and mango have also been

established in this zone. In this zone there has also been an invasion of weedy species including Castor Oil, *Ricinus communis*, a *Euphorbia* ??????. The villagers here recognise that they are using the resources of the national park and are therefore prepared to negotiate agreements about how they can use these resources.

The villages established along the north bank of the river have a more limited direct impact on the park, however livestock from these villages regularly enter the park for grazing.

6.2.1.2 Blue Nile State Villages

The village of Magano which prior to the park extension was located on the border of the park is now the only village which lies deep inside the park. The village is not suitable for year round occupation due to seasonal water shortages and at this time the villagers move to Tabia in the core area of the park along the Dinder river where water is available. The presence of this community in the heart of the park during the late dry season is undesirable since it is likely to have a detrimental effect on wildlife resources due to disturbance and in the long term there is an increased risk of both poaching and disease transmission from domestic livestock to wild animals.

The agricultural practices of the village which includes arable rain fed farming of sorghum, millet and vegetables as well as livestock husbandry has little impact on the wildlife resources of the park. A limited amount of hunting takes place which is considered to have no detrimental effect on the park as a whole.

However the village is located at the foot of the Magano rock outcrop (hill) which is a system of very limited distribution in the park, (according to the habitat map held at the information centre this is the only occurrence, however examination of the available Google Earth image suggests another similar outcrop between the Dinder and Khor Galegu). This system is almost certain to have a completely different set of species associated with it than occurs elsewhere in the park and is therefore of a very high biodiversity value for the park.

The other villages in Blue Nile State lie just outside the extended boundary of the park however the agricultural activities of these villages extend well into the park. This includes the grazing of livestock and rain fed agriculture. This means that although these areas have now been included in the park for more than twenty years they at present contribute nothing to the functioning ecosystems of the park. They carry few trees and once again the Google earth image reveals that the majority of this area is still divided into rectilinear field shapes. Trees are almost absent in this Zone.

6.2.1.3 Sennar State Boundary

There are no villages in Sennar State that lie inside the park. The nearest village is approximately 7km away. The boundary between the park and the village lands in this area is abrupt since trees have been cleared right up to the park boundary. In the northern part of this boundary mechanised farming extends right up to the boundary of the park.

6.2.1.4 Cattle invasion

The entire park is subject to the incursions of cattle. On our second visit we found a large herd of cattle only 3km from the rest camp at Galegu, it was clear from the amount of cattle dung present in this area that this herd had been there for some time. Estimates of cattle invading the park at various times are variable but it seems possible that up to a million may be present at peak times when alternative grazing is not available elsewhere due to restrictions placed on the movement of cattle by rain fed agriculture. In addition to the grazing cattle are also brought into the park to seek shade since shade trees are almost absent outside of the park. Cattle entering the park are accompanied by herders and originate both from settled villages along the borders of the park and also from more distant areas when accompanied by nomadic and semi nomadic pastoralists such as Fulani and Mbororo. The influx into the park during our visit was attributed by the rangers to the eviction of Mbororo/Fulani from the border region of Ethiopia. The impact of these cattle on the park is likely to be enormous, they will compete with the wild ungulates for food, are likely to transmit diseases to wild animals and cause large scale changes to the grass sward. In particular grasses of poor nutritive value will replace highly palatable species and cause a progressive reduction in the quality of the habitat for grazing ungulates. In addition these poor nutrient content grasses are usually dense and tall and act to hide the few remaining palatable species from the more selective grazers such as Oribi and Red Fronted Gazelle.

The causes of this cattle invasion are quite clear since the reduction of grazing land outside the park coupled with the poor law enforcement capacity in the park mean that grazing inside the park is the rational choice for pastoralists. An economic analysis of this situation follows in the section on park management since this has important implications for the ability of the park to enforce the law and for good governance of the park.

6.2.1.5 Fire

The impact of fire on the vegetation is likely to be as significant as the impact of cattle. Fire is a normal part of the ecology of these savannah systems, world wide. And it should be noted therefore that the Savannah systems of the park are well adapted to fire and that many of the trees and plants are resistant to fire while others will be adapted to regenerate either by resprouting from the base or by regenerating from seed. However increases in the frequency of fire and also changes in the seasonal timing of fire will have large effects on the vegetation. In the case of Dinder the high frequency of fires appears to have led to a serious reduction in the perennial grasses. This high frequency of fires is attributed to human influences including fire setting on purpose as well as accidental fires caused by honey hunters.

6.2.1.6 Poaching

Poaching seems to be an important factor in the wildlife population dynamics. Several informants admitted to bush meat being an important part of the diet at certain times of year and people in the Rahad villages commented that in recent years wild animals that had previously been available to them were no longer there. In the past villagers on the

south bank of the Rahad used to shoot antelope that emerged from the park's woodlands to graze on their rain fed fields with shotguns. During the last two to three years these antelope have no longer arrived in the area during the early rainy season.

6.2.1.7 Drying out of the Mayas

The mayas are undoubtedly one of the key biodiversity resources of the park and are important for both birds and mammals. Siltation of the mayas is apparently due to silt being brought down from the Ethiopian highlands and therefore little can be done by the park management to address this situation, However the impact of this Siltation is principally to reduce the depth of water which is collected in the mayas to the extent that it no longer remains in the maya for the full length of the dry season. Potential evapotranspiration in the area is approximately three meters during the dry season so that only pools deeper than this would retain water to the end of the dry season.

6.2.1.8 Park management

In spite of the efforts of the GEF funded project the parks managers and staff remain both poorly prepared and poorly equipped for the task which confronts them. The situation is exacerbated by the high rate at which officers are moved. The parks officers remain members of the police force and can be moved to any other police post as for example happened to the social officer whom we met on the first visit and by the second visit had been transferred to a non-wildlife post in Darfur. The lack of mobility during the wet season makes it very difficult for patrols to operate effectively at this time in order to reduce cattle incursions and to apprehend poachers. In addition the numbers of staff appear to be inadequate for the monitoring and management of an area the size of the Dinder Park, 250 men for 1 million Ha is the equivalent of 1 per 4,000ha. The situation is actually significantly worse than this since these men are spread across only a limited number of ranger posts so that each ranger post actually has to cover almost 100,000ha of park with at any time only one or two patrols in strength available. This density of rangers can be compared with parks like Kruger and Umfolozi in South Africa which have a significantly higher ranger strength per unit area and which receive significant intelligence and manpower support from neighbouring police forces. An analysis of the economics of cattle incursions and law enforcement is given in the text box below.

Text Box 1 Economics of Cattle Grazing and Law Enforcement in the Dinder National Park. A game theory analysis.

When cattle herders enter the park they are faced with a risk of being caught and having a part of their herd confiscated as a punishment for entering the park. They must balance this risk against the alternative risks outside the park where poor grazing and conflicts with both large scale and small scale rain fed farmers affect the condition and survival of their livestock.

The pastoralists then have some simple alternatives in their strategy, They can enter the park and benefit from the better grazing but at the risk of losing half of their herd if caught. They could also remain outside the park in the certain knowledge that the poor conditions outside the park will cause the deterioration of their livestock and lead to an increased mortality. Finally they could attempt to bribe the park guards to be allowed to enter the park without the risk of being caught and prosecuted.

This situation can be analysed as follows and the estimates of values are based on discussions with the parks management and others.

Let E be the expected value of the choices made where the expected value of each result is the cost of that result multiplied by the probability of that result occurring and the expected value of the choice is the sum of the value of all possible results:-

The key parameters that must be entered into the model are as follows:-

V = the value of a cow. (Taken as US\$200 per cow)

N = the size of a herd (Average herds are 200 cows)

p = the probability of being caught if in the park (currently of the 500000 cows entering the park about 5000 are killed each year this results in an estimated probability of being caught of 0.02 if half of the herd is killed since 10000 cows would have been caught)

M = the additional mortality rate for cows if the pastoralist does not enter the park (this is taken as 5% although it may be higher.)

F = the proportion of the herd which is taken if the pastoralist is caught in the park. (Currently half the herd (50%) is confiscated)

G = the value of the additional growth per cow when it is grazing in the park. (This has been taken at the relatively low value of 1 US\$ per cow.)

B = the cost of a bribe. This has been taken as 0.5US\$ per cow.

| Result | Caught | Not Caught | Expected Value of Choice |
|-----------------------|---------------------------------|---------------|--------------------------|
| Choice Made | | | |
| Enter the Park | $((1-F)*N*G - F*N*V)*p$ | $(N*G)*(1-p)$ | -202 |
| | -398 | 196 | |
| Do not enter the park | $((1-F)*N*G - F*N*V)*p$ but p=0 | $-N*V*M$ | -2000 |
| | 0 | -2000 | |
| Bribe the Guards | $((1-F)*N*G - F*N*V)*p$ but p=0 | $(N*G)-(N*B)$ | 100 |
| | 0 | 100 | |

From this we can see that the best strategy for a pastoralist is to bribe the guards since it is only by bribing the guards that he has a positive result however we can also see that even if he does not bribe the guards he will still be better off than if he does not bring his cattle into the park.

However the guards also have a choice in their response to pastoralists entering the park and this will influence the way they carry out their duties. As an incentive for carrying out their duties there is a bonus system in which any fines imposed are divided amongst the staff and the park. At the moment this bonus is divided as follows; 80% of the money is spent on the running of the park and 20% is divided between all 250 staff members. The guard then has several options about what to do and the parks management also has choices. The guards have the choice of spending their time trying to catch the herds of cattle which is a difficult task with a low probability of success or they could go and do a deal with the pastoralist herders to allow them to graze in their area for a small fee. This allows the guards an easy life with an assured additional income. If the guards choose to catch the herds then they will receive their share of the bonus. It has to be recognised that if the guards choose to accept the bribe then this would have to be divided amongst all of the guards at a ranger outpost since it would be impossible to hide the fact from other members of the outpost that there are many cattle grazing in your area and that you are not doing anything about it.

Finally the management could attempt to change the bonus system in such a way as to make it more beneficial for the guards to catch cattle than to receive bribes. They could do this simply by dividing all of the income from fines amongst the men at the outpost involved.

This situation can then be analysed as follows.

The parameters of the model are the same as those above with the addition of the following:-

S = Number of Staff in the Park (currently this is 250)

O = Number of Guards at the outpost. (Estimated at 20 men per outpost)

R = Bonus Rate

| Result | Caught | Not Caught | Expected Value of Choice |
|-------------------------------------|-----------------|----------------------------------|--------------------------|
| Choice Made | | | |
| Try to catch and get existing bonus | $(V*N*F*R*p)/S$ | 0 since no bonus will be payable | 1.6 |
| | For R = 0.2 1.6 | 0 | |
| Accept bribes | 0 since p = 0 | $(B*N)/O$ | 5 |
| | 0 | 5 | |

| | | | |
|------------------|-------------|----------------------------------|----|
| New bonus system | $V*N*R^p/0$ | 0 since no bonus will be payable | 20 |
| | For R=1 20 | 0 | |

Given that each area will have approximately 200 of the 2500 herds entering the park arriving in the region then at present each guard would expect to receive US\$1000 to supplement his income by accepting bribes and a mere US\$320 from attempting to catch cattle. However if the bonus system is changed as suggested this would lead to each member of the group receiving on average US\$4000 per year.

This should act as a strong stimulus for the guards to perform their duties and would I am certain lead to some innovative solutions in the difficult task of catching cattle.

6.2.1.9 Parks Roads and Infrastructure

The parks roads are poorly designed and constructed and rapidly become impassable with the onset of the rainy season. This means that the ranger force is severely limited in its ability to respond to any human impacts on the park including, poaching, cattle incursions and fire. Furthermore tourism in the park is impossible during the rainy season.

The rest camp at Galegu is poorly designed and constructed. The site selection for the camp is excellent since it overlooks a permanent pool in Khor Galegu. Every other aspect of the camp is poor with the exception of the hospitality staff who do an almost miraculous job given the remoteness of the site and the limitations of the infrastructure. The camp buildings although only three years old and recently ‘refurbished’ remain uninhabitable by tourists since the water supply is very poor and the ‘repair’ measures are already failing. This means that it will continue to be extremely difficult to attract tourists.

6.2.2 Situation outside the park

6.2.2.1 Sennar State

In Sennar state closest village to the park boundary appears to be Ombekara which is situated 12km from the main entrance to the park. There is some rain fed agriculture close to the village but most of the area between the village and the park boundary is used for grazing by villagers and pastoralists. The area is almost completely deforested. In the northern area of the boundary zone rain fed mechanised farming occurs all the way up to the park boundary with some evidence from satellite images that it has at times encroached on the park itself. The park boundary appears to be well respected since there seems to be relatively little deforestation extending into the park. On entering the park along this route wildlife is encountered almost immediately suggesting that there is little poaching in this zone.

6.2.2.2 Gedaref State

The north bank of the Rahad river is relatively densely populated. These villages were mostly established following the establishment of the park with two large waves of people arriving in the area in the 1960s and 1980s. These villages have converted the former forested rangeland to rain fed agriculture and have deforested these areas in order to supplement their incomes. Wood taken from these areas has not been used primarily for local consumption but has been exported to larger towns and cities. Further away from the river large scale mechanised farms have removed all trees from very large areas. Thus in these areas farming has destroyed almost all biodiversity resources. Fortunately the very flat nature of the terrain has meant that there is little erosion except in the immediate vicinity of the river where the edge of the first river terrace has been eroded back in a number of places. This erosion however contributes relatively very little to the silt burden of the river. The park boundary is well understood in this area although this appears to be one of the main areas where pastoralists enter the park to graze cattle.

6.2.2.3 Blue Nile State

In the Roseires locality of Blue Nile state the extension to the park proclaimed in 1986 and implemented during the period 2000 – 2005 has not been respected by local communities. The area is completely used for small scale rain fed agriculture. The area lying outside the park is no different from the area in this extension zone. The villages lying just outside the park extension are effectively in a conflict with the park authorities about the extension of the parkland their position is strongly supported by the District Commissioner.

6.2.2.4 Ethiopia

Although it was not possible to visit the area which lies across the border from the park, this area has been declared as a provincial park and there seems to be an intention to convert this into a national park in the near future. There is also a stated intention to link this park with the DNP in order to create a transfrontier peace park. According to DNP authorities it is from this area that a small group of elephants (10) enter the DNP seasonally. Indeed two elephants were reported by rangers at the Tabia outpost in June 2007.

6.3 *Bau Environmental Key Issues*

6.3.1.1 Changes in Agricultural Practices

During the past few years there has been an enormous increase in the amount of large scale mechanised farming in the Bau Locality as land has been allocated to both local and international businesses. These businesses are generally run by managers acting on behalf of absentee landlords. The large mechanised farms have cleared trees from the land in

order to make it easier for tractors to operate in the area. Small scale farmers which have settled along the bottom of the hills as well as on the plains have also contributed to deforestation as a means of supplementing their income by selling wood. Nomadic pastoralists have also been increasingly restricted in their movement as a result of the development of these farms which has resulted in a reduction in the amount of grazing land available which has put increasing pressure on the remaining land which is now heavily overgrazed.

6.3.1.2 Deforestation

As mentioned above deforestation has occurred both in order to clear land for agriculture as well as in order to supplement incomes by the sale of wood and charcoal. Local consumption of wood fuel is also an important additional factor. In addition to this there is a demand for charcoal and wooden supports in the mining activities of the Ingessana hills. This has resulted in the deforestation of these hills which has left them susceptible to erosion.

7 Monitoring and Evaluation

7.1 Overall monitoring

The monitoring will focus on:

Progress monitoring- monitor progress of achievements of set targets against work plan and budget

Process monitoring – monitor compliance with agreed project modalities e.g. of the participatory approach and gender mainstreaming.

Impact monitoring – poverty and vulnerability reduction and improvement of local environment/ecosystem

7.1.1 Overall and Specific Programme Objectives

The overall objective of the Fast Track Watershed Project in Sudan is:

“ensure efficient integrated watershed management and optimal use of the natural resources through the equitable utilization and no significant harm and to target poverty eradication and promote economic development.”

The specific project objectives are:

“i) strengthen relevant local institutions, stakeholders and systems at all appropriate levels for the integrated and sustainable management of watersheds in the Lower Atbara, Dinder and Ingessana project areas, and ii) to stimulate, support and demonstrate fast track appropriate development-oriented investments in the project areas that contribute to poverty reduction and environmental sustainability.”

7.1.2 Main outcomes supported by the Project

- a. Strengthen the role and capacity of localities and supporting stakeholder in the delivery of pro-poor investments and services to promote productive and environmentally sound livelihoods with local community participation.
- b. Strengthen local participation - community and/or a specific watershed user - in the identification of basic livelihood needs within a framework that encourages environmental responsibility and transparency in priority setting and allocation of resources.
- c. Establish an intersectoral and cooperative framework for *efficient integrated and participatory watershed management and optimal use of the natural resources* involving state ministries, Localities, NGOs and local communities.
- d. Local watershed management and development interventions delivered and demonstrated on the ground.
- e. The Government’s commitment to the empowerment of local agents of change (Localities, NGOs) and develop social capital at the local level by strengthening the role of local partners in planning and implementation of improved livelihood activities demonstrated.

7.1.3 Outcome indicators

Progress towards the above outcomes would be measured and monitored based on the following key performance indicators:

- a. Improvement in the diversification and intensification of livelihoods and reduction of environmental degradation caused by target communities and user groups;
- b. Increase in the share of public investments implemented by Localities and NGOs;
- c. Increase in the share of the State budgets elaborated and disbursed on the basis of participatory plans for local development.
- d. Increase in locality projects with substantial community responsibility for planning, implementation and operation.

M&E indicators to be collected at periodic intervals will be divided in the following thematic areas:

| Thematic area | Indicator | Base line | Target |
|---------------|-----------|-----------|--------|
|---------------|-----------|-----------|--------|

| | | | |
|-------------------------------------------|--|--|--|
| | | | |
| <i>Institutional:</i> | | | |
| Integrated watershed planning | | | |
| Participatory planning | | | |
| Community organization and management | | | |
| | | | |
| <i>Land and water development:</i> | | | |
| Water development | | | |
| Crop development | | | |
| Forestry development | | | |
| Rangeland and livestock development | | | |
| Impact monitoring | | | |
| Poverty | | | |
| Environment | | | |

7.2 Social Monitoring

The specific indicators for monitoring of social aspects are recommended to include:

At community level:

Number of new communities reached

Number of transhumant population reached

Number of beneficiaries disagreed by gender in each socio-economic and livelihood group and type of benefits

Summary of community proposals submitted, approved and implemented and completed showing extent of community involvement

Performance of community organisations in terms of members, financial management and responsibilities.

Description of implementation problems and coping strategies

At household level:

Source and level of cash income, types and purpose of animals kept, land-use, expenditures and savings.

Experience with extension services

Experience with income generating activities

7.3 Environmental Monitoring

The specific indicators for monitoring of social aspects are recommended to an number of area specific indicators as presented in the below sub-sections.

7.3.1 Atbara

7.3.1.1 Sand Dune Encroachment

Annual Monitoring of the level of sand dune encroachment should be made at project sites. This can be done by ground observations and by the use of high resolution satellite imagery.

Area of shelter bed and homestead plantation

7.3.1.2 Agricultural Activity

Annual monitoring of the extent of different agricultural activity should be made by field visits to participating communities and interest groups.

% change in land use (to check whether horizontal expansion of crop production is reduced in favour of intensification)

7.3.1.3 Range Condition

Annual wet season monitoring of the composition and density of the grazing sward should be carried out for the project sites.

7.3.1.4 Biodiversity

Area of forestry reserves

Forest reserves impacted by the FTP should be monitored annually during the wet season to establish bird and butterfly diversity.

7.3.1.5 Invasive Alien Plants

The extent of the invasion of Prosopis and other invasive species should be monitored biannually in general and annually in the same forest reserves.

7.3.2 Dinder

7.3.2.1 Inside the Park

Inside the park it is important to monitor a variety of factors that relate to the success of the project.

Cattle Incursions

Game guards should keep records of all encounters with cattle inside the park throughout the year. The number of encounters should be sufficient. Once or twice each year sample areas of the park should be surveyed using a light aircraft to estimate the number of herds in the park. Game guards should regularly visit the permitted use zone around the villages to the south of the Rahad river in order to verify that there have been no incursions from the agreed zone.

Poaching

Game guards should keep records of all instances of poaching in the park. These records should include all evidence of poaching encountered in the park.

Fire

Satellite images taken at the end of the dry season will make it possible to determine the extent of fires in the park. These images should be compared with the parks fire management plan in order to determine its effectiveness.

Range Condition

Annual wet season monitoring of the composition and density of the grazing sward should be carried out.

Animal Populations

Late Dry season counts of all antelope species visiting Mayas and other water sources along the Rahad and Dinder river should be made. A 24hr count should be made on a full moon day by a group of 4 observers at each Maya and water source simultaneously. In addition all chance encounters with flagship species (Tiang, Lion, Roan Antelope, Leopard) should be recorded and mapped in a GIS database.

Agricultural Activity

Annual monitoring of the extent of different agricultural activity should be made by field visits and by the use of satellite images.

% change in land use (to check whether horizontal expansion of crop production is reduced in favour of intensification)

Habitat Quality

Biannual (Wet Season & Dry Season) monitoring of bird communities should be used to determine changes in habitat quality. Butterflies should be used as an indicator on an annual basis.

Invasive Alien Plants

The extent of the invasion of alien species should be monitored annually in the transition zone and around the mayas. In other areas of the park this can happen triannually.

7.3.2.2 Outside the Park**Cattle Populations**

Annual Estimates of the number and distribution of cattle herds using land outside the park should be made by an aerial survey using light aircraft.

Agricultural Activity

Annual monitoring of the extent of different types of agricultural activity in and around the target villages should be made by field visits and by the use of satellite images.

% change in land use (to check whether horizontal expansion of crop production is reduced in favour of intensification)

Range Condition

Annual wet season monitoring of the composition and density of the grazing sward should be carried out in and around target areas.

Forest Cover

Annual Monitoring of the extent of forest cover in the grazing zone should be made using satellite imagery and field visits.

Poaching

Annual monitoring of the availability of bush meat in the villages bordering the park on all sides should be made using undercover investigators.

7.3.3 Bau**7.3.3.1 Range Condition**

Annual wet season monitoring of the composition and density of the grazing sward should be carried out in and around target areas.

7.3.3.2 Agricultural Activity

Annual monitoring of the extent of different agricultural activity in and around target areas should be made by field visits and by the use of satellite images.

% change in land use (to check whether horizontal expansion of crop production is reduced in favour of intensification)

7.3.3.3 Biodiversity

There should be annual monitoring of the plant biodiversity of the isolated rocky outcrops in the plains area. There should be annual sample monitoring of biodiversity in the Ingessana hills this could be done by monitoring of bird and butterfly communities to establish habitat condition.

7.3.3.4 Erosion

Erosion should be monitored in the Ingessana hills. This may be done by the use of satellite imagery and field visits.

Forest Cover

Area of forest cover in and around target communities

8 Environmental and Social Management Framework

The ESMF to be prepared should ensure consistency with environmental and social regulations and laws of Sudan, at the National, State and local-levels as well as with the World Bank safeguard policies. It should describe the instruments that will be used to ensure compliance with the triggered Safeguard Policies and develop documents as required in addition to the EA (such as e.g. Resettlement Action Plans/Policy Frameworks, and others as specified by the safeguards policies).

It is important to develop a practical and effective Environmental and Social Management Framework. It should be included in the project implementation plan including include appropriate training, capacity-building, monitoring measures and institutional arrangements for implementation.

List of References

Elnaiem, Buthaina: The Impact of Social Institutions on the Role of Women: Insights from a Rural Area in North Sudan, OECD Development Centre, 2004.

ENTRO/Y.A. Mohammed: Watershed Management Project -Experience in Watershed Management. A case Study from Sudan with emphasis on Dinder national Park, 2005.

FAO: Project Document for Technical Support to the Establishment and Functioning of the National Land Commission, 2005 to 2007.

Higher Council for Environment and Natural Resources/Dinder National Park Project (2001): Socio-economic Baseline Survey - Village Baseline Survey and Household Baseline Survey.

Higher Council for Environment and Natural Resources/Dinder National Park Project (2004): Terminal Evaluation (unreleased).

IFAD: Butana Integrated Rural Development Project. Appraisal Report, 2006.

Tuhfa Taha Osman Karama: Male Migration and Changes of Women's Role in Rural Settlements. Case Study Blue Nile State/Bau Locality. Ahfad University for Women, MSc. thesis, 2007.

UNDP Global Mercury Project: Socio-Economic Sample Study Of The Ingessana Hills Artisanal Gold Mining Community, Blue Nile State, Sudan by Prof. Khalil A. Al Medani University of Nileen Khartoum, Sudan December 2003

Various CDF documents

World Bank/LICUS, "Assessment of Localities' compliance with and Identification of their capacity needs in Northern Sudan" Synthesis Report, January 2007

World Bank/Social Development Department: Social Analysis Guidelines in Natural Resource Management. Incorporating Social Dimensions into Bank Supported Projects, June 2005.