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Dungonab Bay and Mukkawar Island Marine Park

A Socio-economic Assessment of Sustainable Livelihoods Regimes for Communities of Dungonab Bay and Mukkawar Island Marine Park, Sudan

Incorporating Livelihood Intervention Strategies and Recommendations for the Development of Alternative Income Generating Activities

Paul Harrison

October 2007

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P. Harrison

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Executive Summary

1 Background

Dungonab Bay and Mukawwar Island Marine National Park (DBMNP) was declared by the Government of Sudan in 2005 after African Parks Foundation (APF) was invited by the Government of Sudan to take over management of DBMNP and management of the Park is now in the early stages of implementation. IUCN East Africa Regional Office (EARO) as a partner to APF is providing a technical advisory service to APF in the implementation of the Marine Park.

The aim of this study was to conduct Coastal Livelihood Assessments (CLA) with communities of DBMNP in two villages, Mohammed Qol and Dungonab, speaking with community representatives in both villages. The study includes the suggestion of proposals for alternative or supplementary livelihood interventions for the village communities within DBMNP.

2 Recommendations

The Beja people who live in the study area perceive their surrounding natural environment as being a source of natural capital and have adapted various mechanisms through the customary law of the *silif* to ensure sustainable resource management which should be encouraged and developed to deal with modern realities, especially in the marine resource management of which there is considerably less experience.

Sustainable livelihoods are those which can survive over the long term without becoming a threat to the asset base on which they rely or being threatened by a reduction of those assets. Significant reduction of assets can put communities in a position of greater risk to factors which will increase their vulnerability and make them more susceptible to shocks. Key to reducing potential threats to both the Beja people and the marine park ecosystem will be in finding opportunities to build up the financial, social, human and physical assets of the communities of Mohammed Qol and Dungonab in order to make them less reliant on natural resources. In practice this means the following:

- Greater emphasis on training in managing marine and terrestrial livelihood activities including in efficient and sustainable fishing and other marine based activities in order to gain greater productivity from fewer natural resources
- Continued input of support in the provision of finance in the development of income generation activities that offer the ability to diversify incomes
- Development of a more educated, healthier and energetic population able to diversify their livelihood activities which include more small business based activities
- Support over time the provision of transport, communications and market infrastructure to invigorate local economies and create further opportunities for growth
- Encourage productive relationships with partner institutions who will be able to utilise their skills and experiences into supporting development in the area

A long term training programme working to support the development of community approaches to resource management would be of considerable value and should be focused on the long-term development of the following: sustainable or alternative livelihoods and income generating activities, better business management skills, and robust community based systems of land and marine area management. Individuals and communities may often struggle to both comprehend and act upon new ideas and initiatives, and many likely fear development and change in general. Consequently, any intervention will require a continued process of consultation before attempts are made to introduce it.

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Abbreviations and Acronyms

AIDS	Acquired Immunodeficiency Syndrome
ACORD	Agency for Co-operation and Research in Development
APF	African Parks Foundation - Sudan
AIG	Alternative income generating activity
CBO	Community Based Organisation
CLA	Coastal Livelihoods Assessment
DBMNP	Dungonab Bay and Mukawwar Island Marine National Park
EARO	Eastern Africa Regional Office (IUCN)
FAD	Fish Aggregating Device
FFW	Food for Work (ACORD Programme)
GBP	British Pounds
GMP	General Management Plan
GOS	Government of Sudan
HAC	Humanitarian Aid Commission
HIV	Human Immunodeficiency Virus
IUCN	World Conservation Union
ITCZ	Inter-Tropical Convergence Zone
MFI	Microfinance Institution
MPA	Marine Protected Area
NGO	Non Governmental Organisation
RRA	Rapid Rural Appraisal
RSS	Red Sea State (Sudan)
SDG	Sudanese Pounds[1]
SME	Small to Medium Enterprises
TANGO	Technical Assistance to NGOs
UNDP	United Nations Development Programme
USD	United States Dollars
VEMP	Village Environmental Management Plan
VDC	Village Development Committee
WCGA	Wildlife Conservation General Administration

[1] At the time of research the exchange rates were SDG: USD: 2:1 and SDG:GBP: 4:1.

Glossary

Arabic terms[2]

Bahar	Sea
Bara	Land
Bayad	Yellow spotted trevally fish
Bohar	Snapper fish
Dh'ufra	Perfume made using opercula of certain molluscs
Dirak	Spanish mackerel fish
Dungo	Dugong
Gushar	Grouper fish various species
Kombeer	School barracuda fish
Khor	Seasonal stream
Nagil	Coral trout fish
Nazir	Highest tribal officer
Omda	Middle tribal officer
Sanduk	Box, where women keep any savings
Sheikh	Lower tribal officer
Shaoor	Emperor fish various species
Touwina	Greasy Grouper fish
Qabila	Tribe
Wadi	Valley

TuBedawiye (Beja) Terms

Bahari Silif	Marine component of customary law
Dhura	Sorghum porridge
Diwab	Lineage, minimal tribal group
Foul	Meal made of horse beans and oil
Gwadab	Symbolic token payment for use of land
Hubit	Autumn, rainy season
Imay	Spring
Kurai	Grazing territory of each *diwab*
Lahagen	Gift of animals that a young man receives when he gets married
Mahagaib	Summer
Sakanab	Ritualised greetings used to exchange news and obtain information
Silif	Customary law
Tait	Gift of animals
Togwan	Gift at funerals
TuBedawiye	Beja language
Tusela	Gift given to sick people
Tuyahmu	Animals given or loaned to poor family
Wiyab	Winter

[2] Source of both Arabic and *TuBedawiye* terms: Pantuliano (2000), Hjort af Ornäs & Dahl, (1991) and Tamin (*pers.comm.*)

Scope of Study

1 Background to the Study

Dungonab Bay and Mukawwar Island Marine National Park (DBMNP) was declared by the Government of Sudan in 2005, following several years of preparatory work by the Sudan Wildlife Conservation General Administration (WCGA) and PERSGA (the Regional Organisation for the Protection of the Environment of the Red Sea and Gulf of Aden). Preparatory work included baseline surveys of the marine and coastal habitats and biodiversity of the area, preparation of a Survey Report, and the subsequent preparation of a General Management Plan (GMP).

African Parks Foundation (APF) was invited by the Government of Sudan to take over management of DBMNP in late 2005, and management of the Park is now in the early stages of implementation. IUCN East Africa Regional Office (EARO) as a partner to APF is providing a technical advisory service to APF in the implementation of the Marine Park.

Comment [DJK1]: Represented by the WCGA.

As part of the proposed Park management planning activities, there are requirements for the provision of activities relating to the socio-economic realities of the Park communities. These include the need for Village Environmental Management Plans (VEMPs) for integration into the GMP and for coastal livelihoods assessments (CLAs) to ascertain options for future sustainable livelihood regimes.

2 Aims and Objectives of the Study

The aim of this study is to conduct Coastal Livelihood Assessments (CLA) with communities of DBMNP in two villages, Mohammed Qol and Dungonab, speaking with community representatives in both villages. The study includes the preparation of proposals for alternative or supplementary livelihood interventions for the village communities within DBMNP.

The CLA intends to compliment additional work being carried out by the project partners including the GMP, VEMPs (dealt with by the consultant in a sister report), a baseline socio-economic assessment, park financing strategies and national capacity building.

3 Outline of Study Methods

What follows is a report on the livelihood assessments specific to the two villages chosen for this study. Four discussion groups were carried out, two per village, one per gender, representing a sample of the village inhabitants, typical livelihood activates and age groups. Attention was first given to livelihood *assets* (also referred to as *capital*) divided into five types: natural, human, social, financial and financial. Following this basis of understanding it is possible to discuss and analyse externalities and areas of vulnerability which affect livelihoods, such as climatic seasonality and institutional/political structures and processes. After access to this information through a coastal livelihood assessment, the next step is in devising sustainable livelihood strategies which are realistic and appropriate to the conditions and issues raised during assessment. These include the assessment of alternative income generating activities. The framework and methods for this approach are given more attention in the Methodology.

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Context

1 *Geographical Context*

1.1 Location

Dungonab Bay and Mukkawar Island Marine National Park lies in Red Sea State (RSS) on the eastern coastal boundary of Sudan. The southern boundary of DBMNP is located approximately 115 kilometres north of Port Sudan and the park extends north 90 km. The total paark area is 2800km2, incl. 800 land and 2000 marine. In total the coastline is 200 km. DBMNP incorporates reefs, islands, *khors*, sand and mud bays, seagrass beds, some mangroves and offshore marine habitats.

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Figure 1: Map of Dungonab Bay Marine Park

Source: African Parks Foundation KILIMANYIKA

On its western (landward) side, the Park includes a substantial area of coastal land between 5km and 10km wide. On its eastern (seaward) side, the Park extends between 5km offshore and 35km offshore covering the area of Mukkawar Island and the large complex of reefs to the south of the Dungonab Peninsula.

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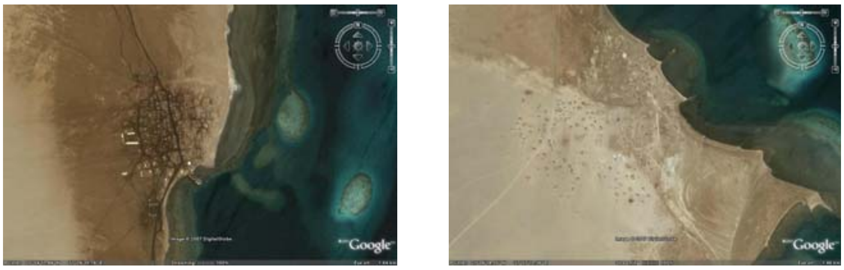
The land area of the park is generally flat, crossed to the northern part of the park by *Khor Shanab*, a seasonal channel that is fed from a long line of hills which run roughly parallel to the coast at a distance of between 20 and 50 miles from the sea. These hills reach up to 1,200m above sea level. The area of land within the park includes two principal villages, Mohammed Qol and Dungonab.

Figure 2: Satellite Images of Mohamed Qol (left) & Dungonab (right) Villages



Source: Google Earth — KILIMANYIKA

1.2 Climate & Rainfall

Rainfall is limited and highly variable, both temporally and spatially. The coastal areas receive rain in the winter time from November to January. Heavy dew is common from January until April. The interior hills receive rain between July and August as a result of the northerly movement of the Inter-Tropical Convergence Zone (ITCZ). Records indicate mean annual rainfall in RSS to be in the range of 30 to 90mm per annum (Babiker & Pantuliano, 2006, Pantuliano, 2000).

Neither the saline soils found on the coastal plains nor the rocky soils found in the hills hold much groundwater which means pastures and thus grazing opportunities are limited as are opportunities for cultivation (Babiker & Pantuliano, 2006).

Temperatures are high, with an average in RSS of 30 degrees Celsius. This rises to a mean average of 36 degrees in the summer (June and July) and falls to 26 degrees in the winter (January and February). Daytime temperatures can be considerable; the high 40's are not uncommon in the summer.

1.3 Population

The population of Red Sea State is estimated at over 800,000 of which more than 60% is believed to be in Port Sudan. Socio-economic and political factors and climate change are increasing rural-urban migration, related to changing circumstances in the management of rural livelihoods. The population within DBMNP is estimated to be in the region of 2000.

The communities living in and around DBMNP are predominantly of the Beja people. The Beja are made up of three ethnic groups, namely *Amar'ar* (also called *Atmaan*), *Bisharynn* and *Hadendowa*. These three groups share a common language and cultural practices which relate to management of their surrounding environment, land and resource ownership and kinship.

The *Bisharyyn*, who dominate the northern part of Halaib Province and RSS in general are the most common ethnic group in Dungonab village. In Mohamed Qol the most common ethnic group is the *Amar'ar*, although there is a great deal of overlap in both areas.

2 Historical Context

The Beja have a long history; the first records of the Beja in North-Eastern Sudan come from Egyptian expeditions to the area c.2500BC. Nomadic traders since Pharaonic times, the Beja are also referred to in early Greek and Roman history. Influenced by the growing number of Bedu and other Arab peoples coming across the Red Sea and from Egypt, the Beja steadily converted to Islam between 1000 and 1300AD and continued to maintain and expand in their livelihoods as nomadic traders of camels and petty goods (Pantuliano, 2000).

The impact of the colonial eras of the nineteenth century onwards began a shift in Beja livelihoods particularly with the impact of taxes and changing land use practices. An increasing number of Beja moved to the towns and to mines to get work the areas over which they are had ranged steadily become eroded. Droughts and famines also took their toll on livestock numbers during this period. After Sudan's independence from Great Britain in 1956, the Beja played an increasing role in the political system of the country partly in order to reduce the state of marginalisation that the Beja were experiencing. However a continued lack of representation combined with a number of severe droughts followed by famine in the 1980s saw the Beja continue to lose their livestock and access both to other assets and to social services (ibid). In particular, the drought of 1985-86 led to the loss of 95% of their herds (Hjort af Ornäs & Dahl, 1991).

The Beja have struggled to recover from these changes, particularly the near complete loss of their livestock, an asset base which has been at the centre of their livelihood strategies throughout their long history. With the loss of livestock, many have sought alternatives. In Port Sudan and other areas, the Beja have sought work in the docks and where they can, and when the mines were open some worked in these. In the rural areas along the coastline the Beja have turned, over a period of one or two generations, from pastoralists to fishermen. However the life and cultures of a nomadic pastoralist are deeply engrained and continue to be evident in Beja society and their outlook on life.

3 Cultural Context

The language the Beja speak is called *TuBedawiye*. It is an unwritten Cushitic language. Partly because it is unwritten, it is slowly being eroded by the use of Arabic, especially amongst the younger and urbanised populations (Tamin, *Pers comm*.).

Through the *Sakanab*, the ritualised greetings of the Beja, a great deal of business is done. Initially enquiring about the state of the family, recent goings on and so on, these long formal discussions allow men to discuss reciprocal agreements and find favour with one another. Long discussions are held by men over coffee which is also a ritualised activity that involves grinding and roasting the beans prior to mixing them with water and sugar.

Beja leadership is managed through a patriarchal system. The *Nazir* is tribal leader. At the middle level is the *Omda*. There is one in each if the study villages. Below each *Omda* are a number of *Sheikhs* who each lead large extended families. Disputes amongst the Beja are first taken to these tribal officials. If the matter cannot be resolved through this system it is then taken to the police and law courts. Most Beja prefer to deal with disputes though this system following the customary law of the *silif*.

3.1 *Silif* Customary Law

Beja livelihoods are regulated by a complex and flexible system of customary law called *silif* which acts as a form of environmental monitoring and taboo. According to Babiker & Pantuliano (2006);

> Silif *regulates access to and redistribution of resources, reciprocal use of environmental resources (grazing land, water points, arable land or firewood), environmental protection (e.g. the prohibition of cutting live trees), conflict resolution and reciprocity around major social events (birth, marriage and death). (Babiker & Pantuliano, 2006)*

Silif has long been a form of managing livelihoods for the Beja who have to survive in an harsh and unpredictable non-equilibrium environment where there is little or no balance to be found between human and other animal populations, vegetation and climate.

> *The aim [of the* silif*] is to protect the environment against over-exploitation....for instance, it would not be appropriate to cut a green tree for wood, but it would be to pollard a green tree for fodder. Rules are flexible and are negotiated between the Beja through alliances and agreements within or between the different groups, clans or lineages. The* shaiks [sic] *usually constitute the "management group" which provides the institutional framework for negotiating such rules (Pantuliano, 2000).*

However, with changes in the conditions in which the Beja manage their livelihoods, particularly the loss of livestock and the weakening of social groups as people have moved to towns and the coast, the strength and impact of *silif* is said to be on the wane, no longer able to function as a means to support people's livelihoods in as holistic or useful a manner as in the past.

Despite the *silif*, some people cut whole trees, although this activity is usually blamed on outsiders who are not aware of customary law that forbids them from doing so. It is apparent that a minority of Beja are trying to work around the taboos of the *silif* by cutting the bark of the trees all around so that when they return the tree is dead – and they are permitted to collect deadwood. However most people spoken to during the CLA state that the majority respect the *silif* and realise the fragility of their environment makes such activity unwise. The influence of the *silif* on Beja society is still a highly pervading one.

3.2 *Bahari Silif*: A Marine Customary Law?

Given the history of the Beja as nomadic pastoralists, it is understandable that the *silif* applies to the land environment most of all. For the fisher communities of Dungonab and Mohammed Qol villages however, there are certain rules and regulations applying to the management and use of marine resources which can be seen as applying to a 'marine *silif*'.

It is suggested in this report that the concept of a marine customary law, or '*Bahari Silif*,[3]' building on existing Beja customary law, could be highly useful to the Beja communities dependent on marine resources for their livelihoods. Through it they would be able to formalise existing rules and practices relating to the use and management of marine resources, the allocation and ownership of these resources. Once recognised as part of customary law, any issues over punishment, resource allocation or favour may be dealt with in typical Beja leadership style. Building on the *bahari silif*, this customary law could be structured through a village environmental management planning process (addressed in a sister report) and be formalised to link in with GOS federal and state laws and the rules and regulations pertaining to DBMNP general management.

3.3 Social Welfare and Resource Allocation

The Beja have a complex and highly supportive system of social welfare and reciprocity. The use of gifts and loans such as *lahagen*, *togwan* and *tait* has allowed the Beja to support the poor or offer assistance in the finances of newlyweds for example. The lineage system of *diwab* divides land ownership between kinship groups, managed by the *silif*, and the system of *gwadab* provides a payment system for land usage. The resource base of each *diwab* is the *kurai*, or grazing territory. However, the social welfare and resource allocation systems of the Beja have developed for a land-based society and have little relationship to management of sea resources. Thus there is no *kurai* division of the sea under each *diwab* and thus no payment of *gwadab* in the form of sea resources. This is a significant point, because it reflects the early stage the coastal Beja of this study are in developing similarly complex management systems for their marine resources.

Comment [DJK2]: This sentence does not flow

[3] 'Bahari Silif' is the suggested term of Paul Harrison, translated by Ahmed Tamim.

Livelihood Realities

1 Introduction

Livelihoods Assessments have been carried out within this study. In a situation of widespread poverty and subsistence by rural communities on natural resources, but where those resources are over exploited, it is essential to be able to find a balance between poverty alleviation and the conservation of ecological resources. It should be recognised that marine and coastal resources provide food and livelihoods and thus if utilised sustainably can act as a safeguard against malnutrition and poverty whilst being maintained in their own right.

The diversification of livelihoods, including the introduction of alternatives where a particular livelihood involves unsustainable utilisation of natural resources, provides an opportunity to create an enabling environment where wealth is spread amongst various income generating activities and develops through multiple income sources without over-utilisation of a particular resource. However: it is of key importance that a clear assessment is made of what resources are available before advocating alternative means of income generation in order to avoid threatening the diversity and wealth of the natural environment.

2 Access to Assets

Livelihood assessments in each village allowed the research to define the assets (also referred to as types of capital) available to communities of each village. Assets were divided into the following categories: *Natural* (nature, environment), *Human* (skills and capacity), *Physical* (services and infrastructure), *Social* (community) and *Financial* (access to savings and credit). Refer to the *Methodology* for more detailed definitions. In the Beja context, natural capital or assets refer to living assets such as marine and land resources, common property resources, pasture, farmland and vegetation. Social capital in the Beja context incorporates the use of kinship and social welfare systems and the governance of society through customary law. It also includes herd redistribution mechanisms. Financial capital includes savings or investments in-kind.

Transect walks were carried out prior to discussions in both villages. The following was noted. Natural resources are limited on land; this is a sparse area, arid, with limited vegetation. The heat is considerable during the summer months, particularly in the middle of the day. The impact of this climate on livelihood activities is apparent; most activities come to a standstill during the hottest hours. Most of the houses were made of driftwood except for a number of public buildings made of more permanent materials. There were a small proportion of houses with enclosures for the sheep and goats for those that keep them. The occasional camel could be seen, particularly on the outskirts of the villages, sometimes laden with goods. There were boats moored up on the shore or jetty, most of these were wooden and many were in disrepair. Some fibreglass boats were evident; others had been taken out to sea. There was a great sense of stillness to both villages, especially in the heat of the day, interrupted only occasionally by the sound of the sea breeze, people, livestock and motor vehicles.

3 Table of Assets

The following table lists the assets typically available to the community, as gathered from discussions Note that, as with all the findings, these were the perceived assets available to the community, not an independent statement of what assets there are.

Table 1: Assets	Village	Dungonab Men
Natural Assets	Natural Assets	Sea, fish (e.g. *nagil, bayad, dirak, gushar, touwina)*, turtles, dugongs, oysters, sea cucumbers, land, wild dogs, wild cats, wild gazelles, pasture, wells, water, very limited fertile land, livestock including goats, sheep, camels
Human Assets	Human Assets: Skills & Capacity	Boat building and maintenance, limited fibreglass maintenance (lack of tools), net making & repair, engine maintenance (limited), understanding of fishing areas, fish breeding areas and times, seasons, fish types by area, aggregation periods, livestock breeding, availability of good pastures, livestock healing, good experience as traders, business
	Human Assets: Education Levels	Low levels of education, mostly on a primary level, lack of funds for secondary school, only one university graduate but who ran out of funds
	Human Assets: Small Businesses	Petty trading, trading of livestock, trading of fish if there are markets, trading between Egypt, local area, Port Sudan
Social Assets	Social Assets: Community institutions and networks	Lack of institutions, limited support from NGOs; help anticipated from APF. Limited support from the government. Some employment from the Oyster Farm. Everyman to themselves.
	Social Assets: Sense of Community	The *Silif* is still in existence, assisting the weak and punishing those who offend but weakened these days. People visit and attend to the sick. In general cooperation is less than in the past because people too poor to help each other.
	Social Assets: Self-help groups	There are self-help groups; there is a registered community association in Dungonab.
Financial Assets	Financial Assets: Savings	Most people are unable to save anything. Incomes are simply too low
	Financial Assets: Investments	Investments are limited. They include shops & restaurants & the expansion of more shops. People collect mollusc shells and fish for income. Income invested in buying fodder for livestock. Livestock are the traditional investment but now limited
	Financial Assets: Access to Credit	Shopkeepers used to lend us money but many have stopped that as they were not being paid back. Banks do lend money but we don't have bank accounts and can't borrow because we don't have collateral. Credit once taken is difficult to repay.
Physical Assets	Physical Assets: Infrastructure	Oyster Farm, school, health centre, mosque, office of the Community Development Committee, office of the women's' centre, boats, Fishermans association
	Physical Assets: Social Services	Education and health services are available.

Table 1: Assets	Natural Assets	Human Assets	Social Assets	Financial Assets	Physical Assets
Dungonab Women	Fish (including *shaoor, nagil, dirak, kombeer*), cash crop agriculture (cucumber, sorghum, water melon), limited livestock (camels, sheep, goats), firewood, medicinal trees, salt	mat making, basket making, trading, mollusc shell collection Most are illiterate, limited primary education common, few have secondary a handful at university but not graduated yet Shops are common forms of trading; trading is integral part of livelihoods, there have been some trying to get into fish processing but it has not taken off, trading of fish to Saudi markets currently stopped	They have a system of Silif, of mutual support to one another, they help the sick and the poor and weak, people marrying and giving birth The Silif is still in existence, assisting the weak and punishing those who offend but weakened these days. People visit and attend to the sick. People used to be given animals or milk but this is rare now. In general cooperation is less than in the past because people too poor to help each other. They have a women's' union which has been set up with the support of ACORD.	There is no saving, but if people can save they reinvest into livestock and on rare occasions into gold jewellery Livestock, gold, jewellery (but much of this has now been sold off to provide cash for basic needs) There is no formal system of credit. Instead women help each other out and take turns in lending money to each other, especially from the shopkeepers. Income is generated through trade and filters down. Loans are paid back in instalments. ACORD set up a formal loans system, each person got SDG130 each but people did not pay back so the system collapsed.	The new village is being built by RSS Governor, we will have schools and clinics, they have the new tarmac road which makes travelling easier but is far from current village. Our men have boats but women have none. The government apparently promised to give the women boats but none have come. There was a generator given to the women by ACORD but the men took it and now it no longer works. There is a school and health centre and mosque and community centre

Table 1: Assets	Natural Assets	Human Assets	Social Assets	Financial Assets	Physical Assets
Mohamed Qol Women	limited dry land resources. 'Dry' trees, water in rainy seasons only, fish (e.g. *nagil, shaoor*), agricultural land (sorghum, ladyfinger) for mix of cash & food crops, livestock (camels, goats, sheep), pasture, medicinal plants & trees.	Petty goods trading, trading of livestock, trading of fish if there are markets, selling handicrafts, food There are people with education on all levels (primary, secondary, university) but the majority are primary only. People who could go to university fail to because of lack of funds. Limited skills in agriculture, good skills in fishing, both locally and for the youth, in Osaif area. Women do handicrafts (mat making, use of camel by-products), tailoring & making clothes, cooking, making cakes, fish processing, training for manual workers, getting courses on nutrition, management skills.	Five small business groups and six 'fodder' groups. Use of small business to develop the local economy. The women have a strong sense of community and understand the need to support each other in a range of livelihood activities. They help the poor through the Silif and based on the incomes they generate. There are 5 groups working in small business development with the assistance of ACORD & UNDP, there are 6 groups producing fodder for livestock, they have a women's' union and a committee that works with all NGOs, the women's' centre has activities including fish processing, tailoring, handicraft making and cookery	Most have no access to credit. Some have been lent money by RSS Governor as an experiment of SDG100 per woman. They have to return SDG20 per month for 5 months. Investments are limited. Income invested in buying fodder for livestock or petty good for trade. Jewellery also an investment. Savings are uncommon but those that have them keep savings in the form of jewellery.	School, health centre, women's' centre, police station, ACORD and APF offices, Locality They have a mill, sewing machines, food processing tools. They used to have nets but not any more.

Table 1: Assets	Natural Assets	Human Assets	Social Assets	Financial Assets	Physical Assets
Mohamed Qol Men	Limited forests, land, limited rain fed cash crop agriculture (sorghum, melon, ladyfinger), firewood, charcoal, Red Sea hills, sea, fish (e.g. *nagil, gushar, shaor*), sharks, dugongs, dolphins, livestock (camels, goats, sheep, donkeys, poultry)	Small businesses exist, especially shopkeepers (about 6 shops). The local economy has been adversely affected by the new road; Dungonab has corned much of the shop keeping & restaurants market, lorries no longer stop at Mohammed Qol. Some women have small shops in their houses. Education is highly limited, except for what can be had from the village schools. A few have been to secondary but most of those could not continue because of lack of funds marine activities (swimming, diving, mollusc shell collection, fishing, boat fixing, engine fixing, net making & repairs, sail making), livestock rearing, healing, use of medicinal plants and trees.	There are no self help groups, just mutual support through the Siilf The Siilf is an active part of peoples' lives. If there are problems, they are solved through the Siilf. If someone breaks the law they are taken to the police station. The police witness but all the proceedings are managed by the tribal leaders using the Siilf. The Siilf organises life and the use of resources. There are rule on use of natural resources both on land and in the sea. There is a fishermen's association but inactive, a youth centre but inactive, many of the youth have left the area to find work, there is a Mohammed Qol Area Society	The women supply each other with credit. The fishermen get credit from merchants so that they can fish. In the past the Agriculture Bank gave credit for buying boats but has discontinued due to lack of collateral or guarantors. Investments are limited. They include shops & restaurants & the expansion of more shops. People collect shells and fish for income. Income invested in buying fodder for livestock. Livestock are the traditional investment but now limited It is difficult for people to save, many do not have incomes.	There is a school, health centre, police station, mosque The new village is being built by RSS Governor. Need an access road to the village. There are boats; all the fibreglass boats are owned by a government company and let to us during the fishing season for about SDG120 per month. There is a military camp, Security office, police station and ACORD and APF buildings

4 Analysis of Assets

4.1 Natural assets

Natural assets amongst the Beja of Mohamed Qol and Dungonab villages are split between *bara* and *bahar*; land and sea. It is clear that land based assets are those most familiar to the Beja in a historical sense and that even a generation or more into living and working with the sea, many of the seas natural assets are not yet fully understood, largely because of limited means to access and learn about them.

The fish species most commonly mentioned in discussion groups were coral trout, groupers of various kinds - especially greasy groupers, snappers, Spanish mackerel and emperors. There is an awareness of other marine species including sharks (which are often feared), turtles, dolphins, manta rays and dugongs. The knowledge of these has usually come about from catching them (notably dolphins and dugongs) in fishing nets, whether deliberately or by accident. There is also knowledge of crabs, sea cucumbers and molluscs, especially those which bring in household use or income.

Opercula of certain molluscs such as *Trochus* are used to produce *dh'ufra* perfume for which at least two different kinds are made, one for men and one for women and are either used as an aid to married life or sold. Beyond the marine resources found within it, no mention was made of the sea itself as an asset in as far as sea water passed through desalination plants produces drinking water, perhaps because this is taken for granted or perhaps because the desalination process is still limited. On land ground water is available for some parts of the year although it is sometimes saline.

On land, resources are said to be increasingly limited, especially for those living on the coastal strip and not in the hills inland. There are limited areas of forest with mostly acacia species which are utilised for firewood, charcoal production and medicinal plants. Wood is also used for shelter and fodder. For the most part, fuelwood is gathered and sold by those living inland and much less so than the inhabitants of the coastal strip who made up the majority of the respondents of discussion groups for this study.

There is limited land available for rain fed agriculture. Although there is an aspiration amongst a number of people in both villages, especially women, to increase agricultural capacity in reality there is very little agricultural land available to the extent that many do not grow sorghum to make traditional *dhura* porridge (or feed their livestock) so people either eat more *foul* (made from horse beans) or buy their sorghum instead. If greater agricultural production was possible people would be able to grow more of their own food than have to buy it as well as further diversify their incomes.

Livestock include camels, goats and sheep. Not everyone owns camels and those that do only usually own one. A combination of 3-5 sheep or goats is a common amount for those that own them. As noted above, livestock numbers have plummeted over a generation. The first phase is reported to be a loss of their camels between the 1940s and 1980s, the second phase a sudden decrease in the sheep and goats that had replaced the camels. The numbers of livestock are now much too low to live off without alternative livelihood options (upwards of 40 head of goats or sheep and one camel per family is considered the minimum for sustainable livelihoods as pastoralists).

4.2 Human assets

For women, there are a range of productive skills available that are channelled into income generating activities. A great deal of experience can be found in livestock rearing and production including the means of breeding and healing surviving livestock. as well as the use of all aspects of dead animals especially camels. However, with limited livestock numbers these skills are utilised less and less.

In general, because of limited education or financial assets, women have limited skills in the productive development of other livelihood activities, however there are a number which are evident, some of which have been developed with the support of NGOs. Amongst the women, these are centred on the ability to make handicrafts (mats, baskets, blankets) and in trading petty goods. Women also collect shells and make *dh'ufra* perfume, however they do not go out to sea. Other productive skills that women have include tailoring and farming. Women also have reproductive skills such as cooking, cleaning, childrearing, fuelwood collection, collecting water and general maintenance of the household. Although not productive economically these activities are an essential part of the fabric of Beja society.

Men continue to build on skills forged over generations in livestock production and trading. A large number are accomplished fishermen and many understand the sea and the resources available to them, whether locally or in Oseif. Many also understand the basic artisanal skills required to maintain their fishing gear. There is limited knowledge of how to increase their incomes from fishing and take advantage of new or potential markets. Notably, many of the youth are reported to struggle to find income generating opportunities in their villages. In line with the findings of Pantuliano (2000), it is clear from discussions that many of the young people leave to find other opportunities, such as in Oseif or Port Sudan and consequently are becoming detached in what they can learn from the elder generations, largely because much of that knowledge, particularly where it relates to livestock production, can no longer be applied.

4.3 Social assets

As noted earlier in this report, the existence of the *silif* provides a central role in adding structure, discipline and the means of cooperation in Beja society, although it is seen to be in decline by most respondents. If a person is sick, going to travel, or getting married, or someone dies, in all cases the community offer assistance. This is within *silif*. Each time of assistance has its own name such as *lahagen* or *togwan*. However for those who have lost their livestock and moved to the coast, these practices are much less common. This is largely because people longer have the financial basis to support others; most live a hand to mouth existence.

In terms of formal associations, these are limited to those which have been developed by NGOs such as ACORD. Many of the associations are set to be dormant or defunct. This is perceived to be because of a lack of capacity (largely financial) to make such associations function economically. It may also be because the format in which they are developed is relatively new to Beja society and needs encouraging. It is notable that Beja society is clearly stratified by gender thus initiatives by women's groups are limited by what they may achieve within the context of Beja society where women's ability to engage in economic opportunities to their full potential is restricted.

4.4 Financial assets

For villages throughout this study, respondents unanimously stated that is very difficult to save cash and that most people fail to do so. This is mostly due to the fact that the majority of respondents operate on a subsistence basis and do not generate significant incomes. It is also due to the fact that this is not a culture of saving cash. Some women previously used a *sanduk* to keep their savings in. Now they say they no longer have savings to put in such a box. Where saving is possible, it is usually reinvested into livestock, jewellery or small businesses.

Access to microcredit in rural areas of Sudan is highly difficult. The vast majority of respondents have no access to credit or do not know how to access it. Only a few have experience of taking loans. Distance from the institutions, lack of infrastructure, lack of awareness, high interest rates, lack of formal groups being formed to share loans together and lack of collateral, make many respondents sceptical about success. Further limitations are a lack of start-up capital to put down as deposits and difficulty in paying back loans. The latter is exacerbated by insufficient knowledge of bookkeeping or cash flow management. Ultimately the communities spoken to have little education on these matters, and this has been borne out by experience; previous attempts to take loans failed when those who were leant the money failed to pay them back. Instead, people borrow from each other, especially from shopkeepers, although this is also becoming increasingly difficult as lenders too often fail to see their monies returned.

4.5 Physical assets

Physical assets are limited. The new road is seen as both a blessing and a curse. For those, especially in Dungonab that have built up their businesses by the road such as the three restaurants found there, the road will bring income from travellers passing through. For those away from the road in both villages, especially in Mohammed Qol, the tarmac road will mean travellers do not need to take as many breaks on the Egypt-Port Sudan-Egypt journey and will increasingly pass Mohammed Qol by. The tarmac road, once completed will also increase the ease of movement to other towns and will likely encourage the trend of rural-urban migration.

Social services are limited, both schools and health clinics lack facilities, trained staff and proper equipment. An interview was held with Mohammed Kalra, assistant at Dungonab Health Centre. He noted that a new hospital is being built into the new village but in the meantime facilities are very limited. They are in need of more staff including technicians, better equipment and transport. Whole new villages are being built by RSS Government but people are not expected to be able to move into them until 2008 at the earliest. It is difficult at this stage to see whether the new villages will be a positive impact on social and economic progress or a limiting one. Advantages will include good quality housing being available compared to the current houses made of driftwood. Disadvantages will include the distance from the sea and the likelihood of the new houses being hot and confined to live in as well as not being developed along kinship lines.

Figure 3: Typical current (left) & future housing (right)

Source: Kilimanyika

KILIMANYIKA

Challenges and Threats

1 Understanding Threats

Challenges and threats to livelihoods are complex and numerous, especially in a situation where the communities live in basic conditions, have few capital reserves and thus rely extensively on their surrounding natural resources, some of which are seasonal and affected by climatic variability. The Beja of this area are also vulnerable to shocks such as political change, natural disasters, disease, drought and famine and often have few means to combat or cushion themselves against unforeseen events, especially now they have unsustainable levels of livestock. This means with ever more regularity, dependence on natural resources, for survival, or profit, or both, is increased and thus social and economic costs also become ecological costs.

2 Vulnerability Context

Understanding the degree of which a community is vulnerable at certain times or in particular circumstances is a key part of a sustainable livelihoods assessment, as is understanding the likelihood of shocks that may occur seasonally or temporally. Ultimately, the more vulnerable a community is, the more at risk they are from external influences or shocks and the more likely they are to be in an unsustainable position, potentially unable to maintain their asset base or their relationships.

The Beja of Mohammed Qol and Dungonab perceive themselves to be increasingly vulnerable to threats, particularly in periods when they struggle to bring together sufficient incomes to guarantee their own food security. At the time of research, they had lost their market to sell fish, particularly coral trout, because the Saudi Arabians had banned imports to Sudan due to a food hygiene scare. Without that income stream and with little else to replace it on that level, the Beja are in an increasingly vulnerable position. The previous year they had a similar problem with the mollusc/shells market which also shut down for a period. The climate also has a considerable impact on their lives; if there is no rain there is no pasture and thus no milk, if the weather is cold they cannot fish.

An increased level of vulnerability exposes the Beja to external shocks especially drought and economic changes, such as the loss of the fish market to Saudi Arabia in 2007. Key to reducing their exposure to such shocks will be addressing the shortfall of their assets and the provision of a cushion of a greater level of assets.

3 Seasonal Challenges

Information was gathered related to changing circumstances over the course of the year and how these circumstances impacted on whether respondents felt a particular month was a relatively difficult or an easy time. Understanding whether a period is difficult or not, and the reasons why, help illustrate the vulnerable periods, times when people may feel their survival is threatened and may respond by increasing the level of reliance on their natural assets or on local or external support.

Life in Dungonab and Mohamed Qol runs closely with the seasons. People are highly dependent on the climate for their livelihood activities and highly vulnerable to extremes in climatic seasonality. Lack of rain means there is no new pasture for livestock or water for crops. Too much rain causes floods and has a similarly negative effect. The non-equilibrium environment in which they life is highly unpredictable and usually temperamental, encouraging a fatalistic viewpoint. As one woman noted; ‘the rain is sent by God, how can we know when it is coming?’

Overall, the winter is considered the hardest because people cannot fish due to the cold which apparently causes a reduced catch. Lack of winter weather equipment also puts people off fishing. For those that have livestock however, the winter is a good time with fresh pasture after the rains. Summer is considered the best time by most respondents because it is a good time for fishing with aggregation of various species not far from shore and good weather conditions.

Notably, the Beja may be able to make the most of their seasons if they plan carefully and diversify their activities. The winter time is a difficult period for fishing, with limited yields and cold weather, but this is also the period of best grazing when there is good pasture for livestock. As the pasture withers away in the summer, fish stocks return in good strength and the weather is hot even out at sea. Getting the right balance of activities through diversification will support sustainable livelihood regimes.

Table 2: Seasonal Calendar (indicating easier and more difficult periods)

Season	Spring (*Imay*)	Summer (*Mahagaib*)	Autumn (*Hubit*)	Winter (*Wiyab*)
Rains			Rains November to January	
Men’s/women’s workload greater		Fishing & Trading		
Income generating activities	Good for fishing, bad for livestock		Good for Livestock, bad for fishing	
Income - good months, bad months	Good for fishing, trade in general		Good for trade in livestock, otherwise difficult	
Expenditure – highs and lows	Preparation of Agriculture	High costs related to needing fodder and fresh water		
Prices – highs and lows		High for fish		High for livestock
Markets – good months, bad months		Best times for fish		Best times for livestock
Human Disease			Respiratory and stomach problems	
Hard times		Hard work, lack of water		Lack of income, hardest times
What livelihood activities when	Livestock & Fishing	Fishing & Trading	Trading	Livestock
Seasonal opportunities		Best trading opportunities	Markets for handicrafts	

Source: IUCN/APF/Kilimanyika Research. KILIMANYIKA

4 *Problems & Constraints*

During each CLA, respondents were asked to identify their problems and constraints as well as solutions if they had any. Understanding problems helps to be able to identify focal areas for improvement in future, whether solved internally or with external support.

4.1 Key Problems

The main problems raised in the two villages under study were as follows:

Table 3: Main problems identified & ranked by respondents of both villages

Problems	Ranking				Overall Result
All raised in meetings	D 'Nab Men	D 'Nab Women	M'Qol Men	M'Qol Women	*1st = Most Serious*
Lack of sufficient/regular income	5	1	4	5	1st
Lack of health services	3	4	3	4	2nd
Lack of education services	2	3	1	3	3rd
Lack of markets	4		5		4th
Lack of food		5			5th
Lack of access to credit					
Lack of clean environment					
Lack of communications				1	
Lack of decent housing				2	
Lack of drinking water		2	2		
Lack of gear and technology	1				
Lack of good pasture					
Lack of skills/technical capacity					

Source: IUCN/APF/Kilimanyika Research. Ranked top 5 only. 5 = most serious. KILIMANYIKA

Comment [DJK3]: With gear you mean tools or equipment or what?

Comment [DJK4]: Is 1 the moset serious or 5, there is contradiction here

4.2 Problem Solving

When asked how to solve their problems, respondents were either fatalistic (it is not something we can change/out of our hands) or they were able to offer a range of solutions. Finding a range of sustainable and profitable sources of income and markets was considered the best way to solve all the other problems except for improvement of social services for which people would like external support, especially from NGOs, to tie in with their own potential input.

Specifically, regarding health services, respondents made formal requests in both villages for an ambulance and for generators. The former, to ensure they can get the very sick to medical treatment in a timely enough manner to save lives and the second to be able to keep their medicines and treatment rooms cool.

Relationships with Institutions

Understanding the types of relationship a community has with various different institutions is a key aspect of a livelihood assessment and the findings presented help to understand not only whether their relationships are socially, politically or economically sustainable, but also whether the community are under threat by other institutions or whether indeed they present a threat to the interests of other institutions.

1 Key Institutions

Assessments included gaining an understanding of the institutions that have a political, social or economic influence on the communities in the study area and these are given below. Key institutions include those that relate to leadership, those that relate to social services and those that relate to income or community support .They are listed in the following table in order of importance following prioritisation exercises carried out in discussion groups.

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Table 4: Important Institutions for Dungonab & Mohammed Qol

Institutions	Ranking				Overall Result
All raised in meetings	D'Nab Men	D'Nab Women	M'Qol Men	M'Qol Women	*1st = Most Important*
School	1	5	4	3	1st
Locality Offices			5	5	2nd
Health Centre			3	4	3rd
ACORD	3		2		4th =
African Parks Foundation	4			1	4th =
Tribal Leadership System	5				4th =
Koran school		4			7th
Mosque		3			8th =
Women's Centre		1		2	8th =
Children's Nursery		2			
Community Centre					
Fishery Research Centre					
Military Camp					
Gulf Pearl Company	2				
Police Station			1		
Salt mine (peninsula)					
School Father's Council					
UNDP					

Source: IUCN/APF/Kilimanyika Research. Ranked top 5 only. 5 = v. important KILIMANYIKA

Comment [DJK5]: Inconsistency?

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For Mohammed Qol, the Locality Government offices are seen as most important. Where these are more distant as in Dungonab they are not seen as important. Education is of prime importance as a key institution to most people as are institutions for of health services to a lesser degree. Aside from tribal leadership, formal government and social services institutions, ACORD and APF were considered the most important and influential, effectively because of their roles as service providers. Religious guidance is seen as important to social life, both in the form of mosques and Koran schools.

Civil society institutions including women's centres and community development centres are also seen as important. The army provide water and transportation from time to time, as do the Security, and the police help oversee law and order through witnessing the procedures of the *silif* councils.

It is of note that by their own admission, despite being an immensely hospitable people, the Beja are typically distrustful of outsiders, even those of their own people if from different *diwab*. This attitude may in part be related to their historical need to survive on minimum resources in an unpredictable natural environment and thus become protective. However there is a sense that a lack of trust make it difficult for outsiders to bring benefits for the Beja to learn from the activities and experiences of others to improve their own livelihoods. It is thus notable that there are relatively few institutions in the area, partly perhaps due to Beja attitudes but perhaps more so because of the harsh and unpredictable environment in which they live being not particularly attractive. This is a situation also due to the reality of the political and economic situation of north-eastern Sudan. The lack of institutions, especially in the private sector, limits learning, growth and trading opportunities and the scope for investment into the area. Currently private sector institutions of note are limited to the pearl farm and the salt mine, the former of which employs a handful of people, the latter offering little economic advantage to the villages.

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2 Potential Partnerships

2.1 ACORD Sudan

ACORD have been working in the Dungonab Bay area since 1987 (Tamin, pers comm.) Their first phase of work was 1987 – 1996; their second has been running since 1997. They work under four key themes; livelihoods (incorporating training and credit, water and agriculture and livestock and fisheries), civil society, peace building and food scarcity. They also work on the cross-cutting issues of HIV-AIDS and gender. ACORD are interested in partnerships with other NGOs in developing their work in supporting development for the Beja. They have worked or continue to work in consortium with organisations such as SOS Sahel, International Refugee Committee and several Sudanese NGOs in the areas of improving livelihoods, capacity building and provision of basic services. With their previous experience in these areas and their network, ACORD are likely to prove an ideal partner for APF given mutually beneficial conditions.

2.2 Gulf Pearl Company

An interview was held with Daniel Dev, a consultant for the Gulf Pearl Company based in Dungonab. Theirs is apparently the only pearl farming project licensed by GOS. They say they work on a balanced policy of making the company feasible in terms of its economic growth, maintaining the resource and harvesting resources for the benefit of people. They are in support of regulated activity. The pearl company deal in the black-lip pearl oyster (*Pinctada margaritifera*), and their entire harvest is produced using farmed species. The black-lip species is well known in the South Pacific but in fact is more common in Dungonab Bay than anywhere else in the world. The company use artificial spat collectors for the first stage of the farming process, strung in a line. From this process usually over 100,000 immature pearl producing shells are produced. Of these the farm uses about a third, the rest they ranch in the sea, repopulating the bay. They take spats of 2cm in length and grow these in cages. Before growing them they inject a perfect sphere pellet into the grafting tissue of the oyster to grow pearls. This company is a potential partner for APF and the community and are willing to train carefully selected individuals into the process. This is detailed further below.

There was insufficient time to meet with other stakeholders or potential partners as this was not part of the terms of this research. However, had there been the opportunity it would have been of interest to develop discussions with companies engaging in trade of fish, livestock and petty goods to both gauge the interest in buying from the Beja of this area and to understand more about the different markets available. One such potential partner for example may be the fish market in Port Sudan.

Livelihood Activities

1 *Current Livelihood Activities*

As has been noted elsewhere, Beja society is highly stratified, with distinct roles and responsibilities for men and women in daily life. This distinction is also found in livelihood activities. Men and women do very different activities. Traditionally, men are the breadwinners and are supposed to support their wives and unmarried sisters. Women are typically discouraged from pursuing economic activities and visiting markets (partly because to do so would suggest the man incapable of doing so). However, there are certain activities that women do which simply put can be divided into productive (income generating) and reproductive (household maintenance) as noted in the human assets section above. These include use of marine resources, agriculture, petty trading and use of artisanal skills for the benefit of small businesses.

The following is a brief summary of the current activities practiced by both men and women in Mohammed Qol and Dungonab villages.

1.1 Animal Husbandry

Animal husbandry, once the lifeblood of the Beja is now no longer a viable livelihood activity for most people living in the coastal villages of Dungonab and Mohammed Qol. The Beja of this area used to have ample numbers of livestock to keep them self-sufficient. Now they have only a token amount, if any. For the people spoken to, the loss of livestock was the greatest impact on their asset base in recent times. However, younger people no longer remember a period when they owned much livestock. For those old enough to have the experience, the transition has been a steady one over a generation or more. However, the level of skills and experiences related to animal husbandry is considerable and it is difficult to see how many of the Beja would wish to abandon all connection to what was their primary livelihood activity. Many wish to restock and most still reinvest any surplus financial capital into livestock if they can.

1.2 Agriculture

Agricultural production is limited, rain fed and long distances inland for both villages. Production is usually found on the banks of *khors* and in *wadis* of which there are few close to the villages under study. The harsh and unpredictable climate makes farming highly difficult with limited options in terms of crops and a reliance on rain or groundwater. Consequently there is very little agriculture to speak of, despite being plenty of land available. There is also a lack of inputs to support the development of agriculture, namely tools, fertilisers, pesticides, high-yield seeds and irrigation. However, whether directly farmed by themselves or bought from their inland Beja neighbours, a variety of fruit and vegetables are produced. Some like watermelons are grown as cash crops only, others such as sorghum for both a combination of cash crop and subsistence.

1.3 Goods Trading

Trading is a long established livelihood activity, woven into the history of the Beja and their self-definition. The majority of people would still prefer to find new opportunities to trade, such as between Egypt and Port Sudan or Khartoum or locally. The *Bisharyyn* are said to be the better practiced traders with a more intuitive interest in business than the *Amar'ar* although that may be hearsay. Nonetheless, an interest in trading is expressed by both villages but particularly by Dungonab and many say they have good contacts with fellow Beja in neighbouring Egypt. The main camel trading centre is found within the contested Halaib Triangle at the town of Shalatein. Men trade livestock, petty goods and essentials like bottled water, motor oil and diesel. Women trade both livestock and petty goods such as cigarettes, sugar and salt. Some sell perfume. According to most women spoken to, their small business activities as they stand are usually not sufficient to give them earnings, only producing enough income to cover their basic needs.

Trading in the area has reduced over time. Mohammed Qol's early place as a trading centre for coastal Sudan soon collapsed after the development of Port Sudan during British colonial times. More recently, the development of Oseif town north of Dungonab Bay also restricts trading opportunities. However, with the right training, investment and focus there is considerable potential to renew small businesses as alternative income generation activities.

1.4 Artisanal Businesses

Many of the Beja are skilled craftsmen and women and have either historical or recently developed skill sets in particular artisanal trades. These include for men, boat building, net making, blacksmithing, mechanics, electricians, livestock butchering, fish processing, leather tanning and catering. For women these include cooking, baking, making handicrafts and tailoring. Again, with the right training, investment and focus there is considerable potential to develop artisanal businesses as alternative income generation activities.

1.5 Shell Collection

Some women collect shells for use as perfume. Some of the shells they keep for use for themselves and their husbands, others they sell. Shells producing *dh'ufra* perfumes are a lucrative business for those that are involved in them. In the sea women collect sea cucumbers and pearl oysters. In season, groups of men regularly use diving equipment to fish for sea cucumbers and shells in deeper water. Some also dive for natural pearl oysters others dive along the lines for farmed oysters under contract to the pearl oyster farm.

1.6 Fishing

With the loss of livestock, fishing has become increasingly important over a generation to the extent that it is now the primary livelihood activity in both Dungonab and Mohammed Qol villages, especially those who are full time resident there and not seasonally resident inland as a proportion of each villagers are.

Fishing is largely a male activity. However, women sometimes fish in the shallows although they do not go out on boats. Other women dry out and salt fish, usually for sale. This allows the fish to last longer without refrigeration. Because of the labour involved and the constant exposure to the elements, fishing is primarily an activity for young and middle aged men. Beyond a certain age, fishing within existing conditions becomes very tiring and many elder men struggle to maintain long hours at sea on a regular basis. Many prefer to chance their luck on land instead. There are two types of fishing boats, wooden, which belong to local individuals and fibreglass which are hired from a GOS holdings company. The latter are favoured and used most of all. Fishing is carried out all year round except January and February when there are no fish available, but relatively adverse weather conditions and a lack of equipment to cope with them mean that fishing largely comes to a halt during the autumn-winter months.

Marketing problems are a considerable limitation. Markets are driven by supply of stock which is usually related to seasonal availability and by demand from domestic and international buyers. Demand for fish is limited in the area they are fished and in Port Sudan because of a limited number of people eating fish, most people preferring meat. Thus Beja fish traders depend on an export market to Saudi Arabia which is limited by ability to supply high quality fresh fish and demand levels which come and go depending on the political relationships between the two countries. Subsequently, while last year may have been a good market for fish, since March 2007 until the time of writing the bottom has fallen out of this market for the Beja. This market will only recover in its current form once Saudi Arabia, or another client nation, resume their demand.

2 Future Livelihood Activities

Discussions were held about how the Beja of Mohammed Qol and Dungonab villages, both male and female, felt their livelihood activities would develop in the future. These discussions were held on the basis that most people feel they are not earning sufficient incomes to survive, many feel vulnerable and many would be willing to develop future livelihood activities that are sustainable within the current ecological context providing they have support with developing alternatives which are both credible and profitable. All the activities mentioned below have been suggested in discussion groups or by individuals and developed for the purpose of this study.

2.1 Need for Diversification

Both from the perspective of DBMNP which is likely to increasingly wish to manage its resources, particularly marine, in a sustainable manner and that of the Beja who recognise that neither livestock nor fishing are giving enough incomes to keep people from poverty, there is a recognised need to find the means to further diversify Beja livelihoods and reduce economic and ecological risks in doing so. This is particularly important as the Beja have largely lost their former primary livelihood activity of animal husbandry yet not fully been able to find a replacement. The replacement may in fact become a range of diverse AIGs. It is also of key importance that as DBMNP is developed that there are alternatives put in place to fishing in areas which the park wishes to conserve, even if only seasonally. As Babiker & Pantuliano (2006) remark:

> *Economic diversification has always been an important strategy for the Beja to complement family income at certain times of the year or during periods of crisis. Multi-resource economies are characteristic of pastoralist societies and they imply the involvement of some members of the family in economic activities other than livestock keeping. Some of the main activities in which the Beja have for a long time been engaging are agriculture, fishing, mining, firewood collection, charcoal making and sale of rural products like milk, ghee, mats, baskets and leather goods. Labour migration to town, especially to Port Sudan as cash labourers on the docks, has also been a constant feature of the Beja economy. However, the scope of the involvement in these non-pastoral activities has dramatically changed over the years. There seems to be a more permanent shift to alternative sources of livelihoods as opposed to seasonal or crisis-related moves to increase family income (Babiker & Pantuliano, 2006)*

2.2 Limitations to Diversification

It is important to be aware of the background reality of an arid, non-equilibrium climate where little can be predicted where the weather is concerned and the heat and desiccation of the land limits many activities that may otherwise bring economic growth. There are also other limiting factors. A small population is one of them, especially as a percentage of the youth continue to leave the village to pursue opportunities in urban areas. A limited population, especially one with a low income base, means limited market opportunities. Low education levels are another, as is a fear of change which is related to both low education and historically conservative attitudes of the Beja to new opportunities, although these are both shifting factors.

Of note, a key limitation is the level of communications and infrastructure available. The influence of the Egyptian-funded tarmac road that is being developed from Egypt to Port Sudan will bring about vast changes upon its completion, expected in 2008. Benefits to the area will likely be focused on Dungonab, where traders have set up three restaurants and a number of petty good stores. However, the quality of the new road means travel times are becoming shorter and shorter. For as long as the tarmac road remains in a good state of repair residents of Mohammed Qol and Dungonab will have to adapt to a trading market that will be centred on the rhythms and customer demands of travellers on that road and locate and develop their businesses accordingly. However the road is likely to increase the pace that new technologies and goods are brought into the area including mobile telephones and ultimately the Internet.

2.3 Agriculture

Women's groups in both Mohammed Qol and Dungonab favour the development of agriculture. However, this is an enterprise that would take considerable resources to develop and it is difficult to see how it would be sustainable if such resources were available. Beyond the current limited seasonal farming carried out inland, to boost agricultural production on a grander scale would require irrigation, most likely through drip-fed mechanisms. This kind of production is rarely seen in arid environments except where there is considerable commercial venture capital available.

Water would have to be brought from deep wells or from the sea through a desalination plant. It would then have to be pumped through pipes, mixed in with nutritional feed. It is likely that some kind of green-housing would be required or at least shading structures. In short, although some support may be offered to existing farming practices through the provision of tools and better seeds, development of large scale agriculture is unrealistic in this climate without a considerable investment of financial and human capital.

2.4 Trading Opportunities

With their historical experience and given the skills available, many Beja of both villages, male and female, have shown considerable interest in developing their own trading businesses, whether catering to local markets or further afield. Trading in petty goods was considered the most popular future livelihood activity in discussions, probably because it can be developed to suit individuals and their families.

Petty Goods Trading

Depending on the goods traded and the size of the enterprise, the trade in petty goods can be managed with relatively little seed capital. The issue will be on keeping the number of traders limited to the size of the market. However, if that balance can be found there are opportunities for both men and women to trade in goods such as cigarettes, soft drinks, bottled water, engine oil, diesel and petrol, packaged foods, perfumes, incense, cakes and other foods and so on. Petty trade can be carried out internally in both villages, between villages, between villages and towns such as Oseif and Port Sudan and between countries, trading back and forth within Egypt to Port Sudan, Kassala or Khartoum.

Clothing & Women's Items Trading

There is an interest in setting up or improving on clothes stores which can sell women and men's clothes, both imported and locally made. As such stores are likely to be run by women or have a feminine influence there is a potential for setting up shops which sell both clothes and other items of interest to women such as costume jewellery and incense.

Groceries Trading

There is an interest in setting up shops dedicated to groceries, the stock of which is likely to have been brought up from Port Sudan or Egypt, or grown locally. Providing that there is a market and that competition is not too fierce, this kind of business may be able to succeed in both villages.

Electronics Trading

As the road is developed and the Beja communities become more exposed to the outside world, especially to passers-by from Egypt and the rest of Sudan amongst other places, electrical supply will become more common in the form of generators and solar power. With electricity will develop a market for electronic goods, especially televisions, radios, satellite dishes, receivers, mobile phones and computer games. As this early market develops there is the opportunity to set up one or two shops selling electrical equipment providing training on how to look after these goods is given. This will be a niche market, but nonetheless the interest and opportunity is there.

Charcoal & Firewood Trading

There is a current and continued interest in the trade of firewood and charcoal to meet the energy requirements of the local area and Port Sudan, especially for those people who have moved into this area as a replacement activity to animal husbandry. There is the potential to develop this industry in a more regulated manner, perhaps through the planting of acacia woodlots in dedicated areas to feed this demand and selling labelled bags showing that it has been sourced sustainably. If the trade cannot be managed sustainably it is recommended that alternatives be found both in terms of energy requirements and in suitable AIGs.

2.5 Artisanal Services

Taking advantage of the range of skills and experience to be found in artisanal activities there is potential to support specialist individuals in offering services particular to their own skill sets and capabilities. The following activities in particular may be encouraged if there is there are the financial inputs and technical support available.

Mechanical Services

As an increasing number of people living in the villages of Dungonab and Mohammed Qol use motor vehicles and as the new road encourages a greater degree of motorised traffic between Egypt and other parts of Sudan, there will be an increasing need for the skills of specialist mechanics. There is a need for mechanical skills to fix both road-going vehicles and both inboard and outboard engines on fishing boats. In the future there will likely be a demand for mechanics to fix or offer support services to leisure-focused vessels such as dive boats as and when tourism is developed in the marine park.

Blacksmith Services

With the villages of Dungonab and Mohammed Qol being relatively isolated from urban centres there exists an opportunity to develop individuals' skills and services in blacksmithing. Where there is a demand for metal work to a certain technical level blacksmiths can and will be able to provide a useful and economically productive service providing the demand is present and the level of quality sufficient to meet people's needs. This will be a niche market, but nonetheless the interest and opportunity is there.

Butchery Services

With the use of meat, especially goat and sheep produce being an essential part of the Beja diet (far more so than fish which is only eaten in times of real hunger and shortage), there may be an opportunity to develop specific local services in butcheries, building on what is currently offered. If the meat can be kept fresh there is likely to be a market for butchers to supply both local roadside restaurants and households.

Bakery Services

Along similar lines to butchery services, bread making is integral to the Beja diet. Whilst there are many household bread ovens in existence there may be an opportunity to develop family run bakeries to offer bread to both restaurants and households.

Handicrafts Services

There are a range of handicrafts made by the Beja, especially the women and the development of cottage industries selling handicrafts is likely to be a practical source of additional income and an opportunity to specialise. ACORD has previously begun a process of supporting women in the development of handicrafts and there is potential to develop these further. If in the future there is an opportunity to develop tourism in the park, handicrafts will be an ever more important source of income. These can include mat and basket making and the production of tanned leather goods.

2.6 Provision of Local Transport

There is a lack of transport connecting Mohammed Qol and Dungonab, and potential to offer public transport services. These may be developed in two forms, one as a minibus shuttle service between the villages and potentially further afield, two, through the provision of a limited number of auto-rickshaws to be utilised in the local area of each village. To develop these would require start up funds for the individuals or group concerned.

2.7 Animal Husbandry – Breeding & Trading

With the deep rooted knowledge of livestock, a small scale restocking programme has the potential to bring livestock numbers back up to levels which could provide a sound economic and nutritional base for both villages. If well managed, specific groups could run breeding centres which provide both meat and other animal products such as leather which would be able to feed into other small business ventures such as butchery, leather tanning and the making of handicrafts. It is clear from the study that if the opportunity arises (namely the provision of financial capital), many people would focus their energies on restocking and breeding livestock, particularly goats and sheep which have a higher turnover, but also camels for specialist markets and local use.

2.8 Offshore Fishing

Fishing has become an essential livelihood activity to the Beja under study. Although many women lack a detailed understanding of how to invest in new equipment because they are usually not familiar with the details, many notably point to the sea as one of key importance to future incomes, especially if the market into Jeddah (Saudi Arabia) reopens. Men with fishing experience point to the fact that the sea is one resource that still hold huge opportunities to them providing the markets can be maintained and the appropriate tools (gear and other equipment) are available. A number of men were able to provide specific details on how they may improve their catch given the right conditions. These are given and expanded upon below.

Livelihood Interventions

As the potential future livelihood activities listed previous section shows, there are a broad number of livelihood activities available to each community given the right factors. It is necessary to identify both the activity and the enabling environment which will either allow a given Alternative Income Generation activity (AIG) to develop or show it to be inappropriate. If an AIG is to be taken forward it will need to adhere to core objectives of the marine park, namely to reduce pressure on marine resources and to strengthen livelihoods.

A number of AIGs are proposed for potential trials which build upon the future livelihood activities proposed by the Beja as listed above. These are listed below following an explanation of the tools and technical interventions that will be required for any such interventions to be successful.

1 Tools for Intervention

A combination of lack of financial capital and lack of training and technical knowledge are the most prohibitive factors in developing AIGs. Therefore before specific interventions are discussed, an overview is given of the tools required for intervention.

1.1 Financing

Microfinance is one option for providing funds for a range of income generating activities especially where external sources of funds are not available or are in short supply. Microfinance entails offering financial services to the poor (savings, credit, transfers, insurance). Donor support tends to go towards lending (microcredit). Microcredit is one of many intervention strategies designed to alleviate poverty and generate income. It is most successful when implemented by a professional microfinance institution (MFI), where there is existing economic activity and where there is discipline in repayments. However, given, in their own words, the lack of understanding of financial management amongst most Beja in the study area and the lessons learnt from the failed lending programme run by ACORD, microcredit is not recommended as an intervention tool in this instance unless considerable training in bookkeeping and financial planning is first given.

Instead, it is understood that APF offer a community development fund which is paid monthly to each village for their own benefit. It is recommended that APF build on the following proposed AIGs to develop carefully planned and detailed proposals for a number of accepted AIGs and in line with the findings of further community consultations. Depending on the budgets available, APF may then develop a number of these proposed AIGs into specifically funded interventions. To prevent favouritism amongst groups APF may need to come to an agreement with those parties who receive funds that a percentage of their profits be channelled back into the fund for others to benefit from, at least for a certain amount of time. Alternatively, it may be agreed to take turns in receiving funds.

1.2 Technical Support and Advice

In all sectors discussed during the livelihood assessments, participants frequently showed concerns that a key limitation to their prosperity was the lack of knowledge or capacity of specific activities, whether in developing an existing activity or an AIG. Depending on what AIG they are being supported in developing, communities will require advice and training from research bodies, specialists and potential business partners before engaging in pilot projects and future AIGs. Knowledge of the laws relating to proposed activities such as which resources or species can be utilised within which areas will also be required as well as initial Environmental Impact Assessments where necessary. Further consultation with appropriate GOS institutions and NGOs will be advisable in order not to repeat research or ignore established successful practices. It may be useful for APF in implanting a potential AIG to draw on the services of a particular partner with specialist experience, such as ACORD for example.

Core areas which will require technical support and capacity building include:

- Advice on bookkeeping, planning and financial management
- Advice on the formation of appropriate CBOs or businesses
- Advice on markets, marketing and quality control
- Advice on detailed aspects of the specific AIG by experienced partners
- Provision of links to new markets and networks
- Advice on legal issues relating to the specific AIG

In all sectors, even those where target individuals or groups already have sound experience, technical support should be given and supported by APF staff or their partner organisations.

1.3 Equipment Provision

It may be to the benefit of both DBMNP authorities and the Beja communities for APF to assist in the provision of equipment to develop AIGs. This is especially relevant in the case of fishing. APF may wish to consider a gear exchange programme to replace nets which cause harm to juvenile fish stocks or mammals such as dugongs and dolphins with nets that will not cause a detrimental effect on the marine ecology.

2 Sectors for Intervention

2.1 Offshore Fishing

Fishing, as shown in the assessments is a highly significant form of income generation for the Beja of Mohammed Qol and Dungonab. Interventions which aim to take the pressure away from fish and marine stocks in the shallow and protected waters of the bay can be through the establishment of an AIG which will develop fishing in the deep waters away from the bay environment whilst reducing fishing in the shallows. Currently a minority of community owned boats have the capacity to fish in deeper, exposed waters, the majority do not. A further limitation is that the majority of fishers do not have the gear for deeper waters and larger catches. Most of the fibreglass boats are owned by a GOS holdings company. This is an issue when looking at steps for intervention; there will be a need for the formation of CBOs to manage new boats as a business as it will not be possible to use the fibreglass boats unless clear agreements are drawn up. In any case, it is likely the current fibreglass boast are not large enough to manage a larger scale fishing operation nor do they have inboard engines.

Thus, interventions in current unsustainable fishing practices will need to be in the form of the introduction of larger vessels, equipped with inboard engines. The vessels will need to be stable enough to cope with rough weather and high seas. Navigation equipment and winter weather clothing will be required to increase the distance that can be travelled out to sea and to allow the fishers to sail during the winter months. Gear will need to be provided with long lines and gill nets upwards of 3 ½ inches introduced. Although the fishers have a broad depth of established knowledge, training should be provided to craft and use the new vessels, manage sails, maintain engines, deal with the currents and weather, and given an indication of the kind of fish they will get markets for and how to treat their catch. Cool boxes should be installed of significant capacity to be able hold a tonne of catch per trip. Ice for these may either be supplied by buyers in Port Sudan or through the purchase of a generator-powered refrigeration unit based in each village, although purchase and maintenance of these will be difficult and costly. It may also be possible for the fishermen to hire both vehicles and iceboxes from Port Sudan as a package deal. Keeping the stocks fresh until the market place will be vital to increasing incomes. Clearly, it is first essential to gauge whether a market exists following the problems with the Saudi Arabian market in 2007. If only a seasonal market exists then the yield should be of sufficient value to allow the fishermen to resume terrestrial AIGs out of season and thus allow the stocks to replenish. The profit and loss of this enterprise should be carefully assessed according to requirements but is expected to cost in the range of USD$12-15,000 to set up including one new boat and all the associated equipment.

Fish Aggregating Devices (FADs) may be introduced in the longer term. These are rafts or buoys anchored to the sea floor which could be deployed in deep water (1000-2000m depth) to attract skipjacks and yellow fin tuna and other offshore pelagic fishes (Ireland *et al,* 2004) and increase catch per unit of effort. Since they are cited as a highly successful AIG in the Comoros Islands (ibid) but as yet largely untested, especially in Red Sea waters, it is recommended that further research/consultation on FADs as part of an offshore fishery AIG in DBMNP is conducted. They are likely to be expensive to set up and training will be required. Before any introduction of an offshore fishing project further assessment of their viability should first be carried out, including a cost-benefit analysis and an ecological assessment of whether there are sustainable stocks of pelagic or deep sea demersal fish stocks.

According to discussions with a number of Beja fishermen interested in developing their fishing opportunities, in the case of *Nagil*, if the middle man can be cut out, rather than make in the region of SDG5 gross per kilogram at source if they transport in good condition to Port Sudan they can make up to SDG9 gross per kilogram. In their own discussions they calculated that there would be no fishing in January or February due to lack of stocks. They also stated that in July there can be heavy competition with outsiders in trawlers which brings yields right down. This is of note for APF and potentially an issue (relating to user rights) for the park GMP.

2.2 Mariculture

Apart from the pearl oyster farm, referred to below, there is no noted practice of mariculture in either Mohammed Qol or Dungonab. There is however a sound knowledge of marine species that may be utilised for mariculture. Currently, there is a random collection of various species of mollusc, notably for the use of opercula for perfumes and oysters for pearls. Sea cucumbers are also collected at random and sold to interested buyers where markets can be found.

Potentially then, with guidance inhabitants of Mohammed Qol or Dungonab may be shown how to breed sea cucumbers in ponds if this is considered feasible by consulted experts. Similarly under advice they may be taught to breed certain species of finfish in ponds and molluscs in submerged cages. The limitation of pond cultures in this area is the limited tidal flow; thus there are likely to be very few sites with sufficient tidal flow to support such an activity. The limitation of cages is in where these may be placed and how they may be accessed with limited experience and the appropriate technology. Nonetheless, it is recommended that research be carried out into the feasibility of mariculture for the Beja of this area.

2.3 Pearl Oyster Farming

As a form of mariculture, farming of pearl oysters has strong potential as an AIG for a select family or group of individuals. There are currently two ways in which oysters are found. The first is the collection of natural oysters by divers. The problem with this activity is that naturally found oysters very rarely produce pearls of any commercial value. The pearls within are usually very small and often misshaped. There is also the issue of sustainability; there are a limited number of oysters and it would require the collection of many thousands to produce a profitable yield on a regular basis which is likely to be well beyond the capacity of Dungonab Bay to cope with. A survey of oyster numbers would give a definitive understanding of their capacity.

Of greater economic value and more sustainable is to farm oysters artificially. This is the process being undertaken by the Gulf Pearl Company in Dungonab Bay. The company is open to a proposal by the Beja communities, potentially in conjunction with APF to offer oyster spats to out-growers.

They are also willing, for an agreed fee, to train a small number of local people in the complicated process of how to successfully insert a round 7.5mm ball made from a *pagtoe* shell in conjunction with grafting tissue into selected oysters and then breed them (Dev, *pers comm*.). The process can produce a perfectly spherical pearl of considerable commercial value. These would be sold through the companies channels to its buyers in Dubai. 40% of grafted oysters produce saleable pearls and the price range for each pearl can be between USD$10 and $50 depending on the grade (A to D). There is also the secondary benefit that if it can be kept in good condition and a market found, oysters also have commercial value for their meat.

Figure 4: Pearl oyster farming tools (left) & natural pearls (right)

Source: Kilimanyika

K I L I M A N Y I K A

The advantage of working in partnership with the pearl company is that the technical support is on hand as are access to markets. The disadvantage is that as a complicated process, only very few people would benefit. However it is an AIG worth assessing further as a potential intervention.

2.4 Animal Husbandry

As has been discussed above, livestock breeding and rearing is well understood by the Beja in general, especially the older generations. A potential intervention would be to set up a pilot restocking programme in both villages, especially of sheep and goats. The profit and loss of this enterprise should be carefully assessed according to requirements. The advantage of such a programme would be that if successful a steady restocking of livestock would reduce the reliance on the sea. It would also reduce the level of seasonal vulnerability that the Beja face during the winter when they cannot fish and thus their reliance on external support. Reintroduction of substantial numbers of livestock through a carefully monitored breeding regime managed by specialist partners would allow the Beja the diversity of income and thus the freedom to choose whether to spend part of the year inland and re-establish older practices of nomadic or semi-nomadic pastoralism. However, for the latter to be successful would require a substantial restocking programme which is likely to be beyond either the financial capacity or the objectives of APF and its partners. However, if external funds could be sourced, livestock restocking is likely to be sound intervention providing it is done so within the limitations of a non-equilibrium, arid terrestrial climate.

2.5 Trading Centres

Many of the Beja who were consulted for this study in both villages expressed an interest in developing their businesses and artisanal trades, examples of which have been given above. It is suggested that two trading centres be developed if the funds allow. The first would be by the roadside in Dungonab near the current restaurants and trading area. The second could be by the roadside on the outskirts of Mohammed Qol near the new village. The aim of both would be to sell goods and services in well organised shopping centres. Both would sell petty goods as well a specialist products or services depending on the type of artisanal capacity available. Key to the success of such ventures would be careful management during the set up phase to ensure a highly marketable trading centre would be produced as well as careful attention to where any financial grants made for these activities be invested at least until the training period be complete. Of real importance will be the location of both shopping centres and the range of goods and services involved by the businesses supported in them. It is not particularly importance that these are well designed structures but it will be important to make sure there is the right mix of trades and goods on offer. It would be advisable to develop both shopping centres to offer different goods and services so that passers-by will stop at both knowing that what is available in one place is not available at the next. For example, Dungonab currently dominates the restaurant market and thus it would be unwise for Mohammed Qol to try and take a share of that market as they are unlikely to succeed at this stage, whereas they may be well placed in setting up an electronics shop, or a women's clothing store for example. Thus a spirit of cooperation should be fostered between the traders and artisans being assisted in both villages if such assistance is forthcoming. However, careful consideration will need to be made into which markets are feasible and which will be best placed in which areas. A transport system between the two villages would encourage trade. The disadvantage of this intervention is that it is complex in ownership, would likely need financing from external partners and would be set up in an area with limited economic development. All such factors should be considered and the profit and loss of this enterprise should be carefully assessed according to requirements.

2.6 Tourism

One area discussed regularly during this study was the potential for tourism development following the development of the marine park. It is widely felt that tourism is at least five years away but that there is a strong interest amongst the Beja of both villages in seeing it work. If successful, tourism would offer a boost to the economy on many levels. Currently the limitations of the Beja in working in tourism is their general lack of skills and experience in working in such a sector, a lack of language skills particularly in English and a lack of understanding of the advantages and disadvantages that tourism can bring to a society. There would need a considerable training and awareness programme well in advance of any proposed tourism venture to bring the skill sets of the communities up to an appropriate standard.

It is also of note that there are concerns amongst the inhabitants of both Dungonab and Mohammed Qol that tourism will impact upon their culture, especially with regards to codes of behaviour and dress. However most feel confident that they would be able to preserve their culture, maintain their current livelihoods and benefit economically from the introduction of tourism. A tourism AIG would be a potential intervention able to allow for greater economic diversification and the reduction of activities that have a greater impact on the natural environment. As such the potential for tourism in as far as it would benefit Beja livelihoods is one worth continued assessment.

Discussion & Recommendations

The following discussion reviews and makes recommendations on some of the principal issues and themes that have arisen from carrying out this study. It does not however, seek to repeat the findings of the research. The Beja people who live in the study area perceive their surrounding natural environment as being a source of natural capital and have adapted various mechanisms through the customary law of the *silif* to ensure sustainable resource management which should be encouraged and developed to deal with modern realities, especially in the marine resource management of which there is considerably less experience.

The level of dependency on natural assets by communities from Mohammed Qol and Dungonab is significant. The impact on natural resources is accelerated when people have no income or worse no food, and look to the environment for support. Further, the basic realities of supply and demand are prominent market forces dictated by seasonal change which in turn dictate people's response to their environment. Future interventions must therefore take into account the place they must fit into the dynamics of the marketplace as well as the influence they are likely to have on that market, positive and negative.

Sustainable livelihoods are those which can survive over the long term without becoming a threat to the asset base on which they rely or being threatened by a reduction of those assets. Significant reduction of assets can put communities in a position of greater risk to factors which will increase their vulnerability and make them more susceptible to shocks. Key to reducing potential threats to both the Beja people and the marine park ecosystem will be in finding opportunities to build up the financial, social, human and physical assets of the communities of Mohammed Qol and Dungonab in order to make them less reliant on natural resources. In practice this means the following:

- Greater emphasis on training in managing marine and terrestrial livelihood activities including in efficient and sustainable fishing and other marine based activities in order to gain greater productivity from fewer natural resources
- Continued input of support in the provision of finance in the development of income generation activities that offer the ability to diversify incomes
- Development of a more educated, healthier and energetic population able to diversify their livelihood activities which include more small business based activities
- Support over time the provision of transport, communications and market infrastructure to invigorate local economies and create further opportunities for growth
- Encourage productive relationships with partner institutions who will be able to utilise their skills and experiences into supporting development in the area

As local economies in Mohammed Qol and Dungonab develop, not only will natural resource utilisation increase but the demand for improved services from central and district governments will increase. Once the road is completed, many of the markets, goods, services and communications networks currently not available to the communities will be supplied. Thus it will be important for DBMNP managers to assist and help shape that development in a manner which suits the needs and aspirations of both the local communities and the marine park authorities.

A long term training programme working to support the development of community approaches to resource management would be of considerable value and should be focused on the long-term development of the following: sustainable or alternative livelihoods and income generating activities, better business management skills, and robust community based systems of land and marine area management. Individuals and communities may often struggle to both comprehend and act upon new ideas and initiatives, and many likely fear development and change in general. Consequently, any intervention will require a continued process of consultation before attempts are made to introduce it.

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Appendix 1. Methodology

In carrying out field research that is objective, thorough and representative, it is important to keep in mind a range of factors that will influence results and limit the accuracy of the data gathered. Care was therefore taken to ensure that the viewpoints gathered where representative of different groups within the study area, particularly given the likelihood that certain groups and individuals may be less influential than others, such as women and younger men with potentially diverse and conflicting resource priorities, values and beliefs.

1 Criteria

It was agreed that coastal livelihood assessments should be carried out in two settlements to satisfy a balance of the following criteria.

- Are the principal settlements found within Dungonab Bay marine park area
- Be those settlements most likely to be affected by change in the area
- Be those settlements where the population are utilising marine resources

The two settlements were asked in advance to prepare two groups of community members for RRA discussions, one male, one female, over one day of livelihood assessments per group, as well as a number of prioritisation activities. Each group was selected to provide a balance of individuals according to:

- Spatial; a mix of people from different parts of the village
- Social; a mix of people from different kinship groups
- Economic; a mix of people representing different livelihood activities
- A mix of different age ranges

It would have been preferable to have taken two or three days per group to carry out the livelihood assessments, and to have split the groups into younger and older participants per gender, however this was not possible due to time constraints and the methodology was adapted to take these factors into account, by focusing all activities within a day for each group.

2 Coastal Livelihoods Assessment

The methodology was based, with significant changes and adaptations by the writer, on Ireland (2004) and Malleret (2004), and built on earlier sustainable livelihoods studies in Tanzania by Paul Harrison/Kilimanyika (Harrison, 2005, 2006, 2007). The following factors in particular were taken into account.

- Temporal and spatial constraints (one day available per settlement, most of which were difficult to access)
- The need to gather specific information and perspectives relating to community livelihoods and the management of their environment.
- The need to allocate a substantial proportion of the time available to travel between settlements, and to data collation, analysis and reporting

However, the key approach within livelihoods assessment methodology, the use of Rapid Rural Appraisal techniques was retained (see discussion below). All meetings were carried out in Swahili.

Sustainable Coastal Livelihood Assessment is a method of gathering qualitative data and was chosen because it uses participatory and targeted research methods to gather objective viewpoints of different groups within a certain society. In livelihood assessments, which in this case were divided by gender group, attention is first paid to gathering perceptions of the livelihood assets (forms of capital/resources) available to the communities, and these are divided into five types:

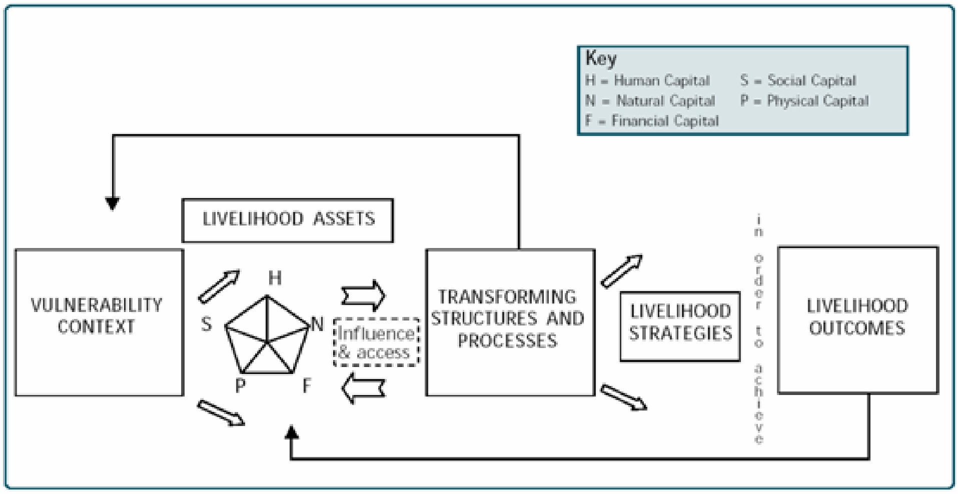
Table 5:	Livelihood Assets
Natural	Land, forest, rivers, lake life, terrestrial life, marine life, biodiversity.
Financial	Savings in the form of cash and liquid assets such as grain, livestock etc.
Human	Knowledge, skills such as beehive making, good health, education, ability to work etc.
Physical	Roads and transport infrastructure, buildings, communications etc.
Social	Networks between individuals, relationships, members of groups etc

Source: Kilimanyika, after Scoones, I,. in Carney, D,. (ed) (1998) KILIMANYIKA

An understanding of these assets brings awareness of the opportunities and limitations facing a community or individuals in developing their livelihoods as well as the direct and indirect values gathered from these resources. People are either enabled or restricted by these assets, for example, the skills and experiences they have, the equipment available to them, the existence or otherwise of savings or the availability of natural resources for utilisation within income generating activities.

Based on this understanding, it is possible to discuss and analyse externalities and areas of vulnerability which affect livelihoods, such as climatic seasonality, institutional/political structures and processes, access to land and other resources and attitudes towards resources. After accessing this information, through a livelihood assessment, the next step is to devise sustainable livelihood strategies which are realistic and appropriate to the conditions and issues raised during assessment. The following diagram gives an overview of this framework.

Figure 5: Sustainable Livelihoods Framework



Source: Carney, D., (ed) (1998) KILIMANYIKA

3 Rapid Rural Appraisal

It was with the understanding that different groups would have a variety of perspectives on the research topics, that following the work of Chambers (1983,1992), Rapid Rural Appraisal (RRA) techniques were chosen to support the sustainable livelihoods assessment as the most appropriate, practical and equitable form of gathering representative qualitative data of the kind intended for this research given the context and time scale available.

RRA was chosen as opposed to PRA because of the limited time available. RRA is a more extractive process where the agenda lies more with the interviewer than PRA, but allows for a more targeted, shorter appraisal. PRA is preferable where the researcher can spend longer periods in the study area than was possible for this research. It was also preferable in this instance because of the use of a translator and allowed the writer to structure the assessment through following a detailed set of translated questions and maintains the ability to guide the process.

4 Stakeholder Consultations

It was not within the remit of this report to speak to additional stakeholders or future partners. However during the course of the research the writer was able to carry out a limited number of semi-structured interviews. Future research on livelihoods would be likely to benefit from a series of meetings and interviews with stakeholders who may be able to influence the development of both the marine park and the Beja people living within it.

5 Limitations

Time and economic constraints meant that the writer was not able to gather as much data at each location as might have been possible. This work is based on qualitative, not quantitative data. Further, research was carried out through the use of translators and it is possible that some details or emphasis may have been overlooked although it is hoped not.

Field Activities

This report is based on the first of two studies, the first being Coastal Livelihood Assessments (CLAs) and the second being Village Environmental Management Planning (VEMPs). The following table indicates the time spent on field activities.

Table 6: Timetable of Field Activities in Sudan

Day	Date	Activity
1	29 August 2007	Travel UK to Khartoum (Paul Harrison)
2	30 August 2007	Travel to Port Sudan (Paul Harrison)
3	31 August 2007	Preparation of team and questionnaires
4	01 September 2007	Training of facilitators by Paul Harrison
5	02 September 2007	Travel to MPA, preparation, logistics
6	03 September 2007	CLA Dungonab Village Men
7	04 September 2007	CLA Dungonab Village Women
8	05 September 2007	CLA Mohammed Qol Men
9	06 September 2007	CLA Mohammed Qol Women
10	07 September 2007	Rest & Recreation, CLA Overview
11	08 September 2007	Rest & Recreation, VEMP preparation
12	09 September 2007	VEMP Mohamed Qol Mixed Gender
13	10 September 2007	VEMP Mohamed Qol Mixed Gender
14	11 September 2007	VEMP Dungonab Mixed Gender
15	12 September 2007	VEMP Dungonab Mixed Gender
16	13 September 2007	VEMP Mohamed Qol Mixed Gender
17	14 September 2007	VEMP Mohamed Qol Mixed Gender
18	15 September 2007	VEMP Dungonab Mixed Gender
19	16 September 2007	VEMP Dungonab Mixed Gender
20	17 September 2007	Rest & Recreation, Return to Port Sudan
21	18 September 2007	Preparation of data for write-up
22	19 September 2007	Travel to Khartoum (Paul Harrison)
23	20 September 2007	Travel to UK (Paul Harrison)
24	21 September 2007	UK for write-up of CLA & VEMP reports

Source: Kilimanyika Research

K I L I M A N Y I K A

Appendix 2: Livelihood Assessment Checklist

SUSTAINABLE COASTAL LIVELIHOODS ASSESSMENT[4] INCORPORATING CURRENT AND ALTERNATIVE LIVELIHOODS: DUNGONAB BAY MARINE PARK, SUDAN.

PRIOR TO DISCUSSIONS

1. TRANSECT WALK

Purpose: To observe and discuss what resources and facilities (natural & physical assets) are there in the village, how people are living day to day (human & social assets) and what livelihood activities are undertaken.

Steps:

1. Take note of the following on a short walk around the village:
    - Natural assets (i.e. crops, forest, sea, rivers etc.)
    - Access to these natural assets by different members of the community (wealth & gender)
    - Vegetation (mangroves, maize, sorghum, vegetables, seaweed etc.)
    - Physical assets (landing sites, market, roads, schools)
    - Access to these physical assets by different members of the community (wealth & gender)
    - Livelihood activities undertaken at different points
    - Problems
    - Opportunities
2. Keep your eye out for unplanned discoveries. Stop from time to time at particular points and take relevant notes or make diagrams.
3. After the walk share your findings and relate these to the overall objectives of the study.

LIVELIHOOD DISCUSSIONS: RAPID RURAL APPRAISAL (RRA)

1. IDENTIFYING ASSETS

Remember In this context assets refers to the following:

Natural *land, forest, rivers, marine life, biodiversity etc.*
Financial *savings in the form of cash, income, liquid assets such as grain, livestock, jewellery etc.*
Human *knowledge, skills such as boat making, good health, ability to work etc.*
Physical *roads and transport, buildings, communications etc.*
Social *networks between individuals, relationships, members of groups etc*

WHAT NATURAL ASSETS?
Sea, marine life. What types of fish?
Land, crops, what crops? Is there intercropping? Agroforestry?
What food crops do you farm?
What cash crops do you farm, if any?
Livestock what amount? Which kinds?
Forest and forest products if any (timber, building materials, medicines, charcoal, fuelwood, carpentry/carving materials)
How much land is available for activities?
Is there any land not being used? Why not?
How much marine area is available for activities?
Are there any restrictions?

WHAT HUMAN ASSETS?
What skills do you have?
What capacities do you have?

[4] [4] Source: Checklist developed by Kilimanyika for CLA in East Sudan context, adapted from Harrison, 2005a, after Ireland, 2004.

What Education?
What small businesses are there? How many are involved in these?

WHAT SOCIAL ASSETS?
(Perceived): community institutions and networks, sense of community. What groups are there, what sense of social cohesion?
Existence of lineage systems and customary law

WHAT FINANCIAL ASSETS?
Do you have savings?
Do you have investments?
Do you have access to credit?

WHAT PHYSICAL ASSETS?
What kind of infrastructure do they have?
What kind of boats do they have?
What kinds of technology/equipment/machines/tools do they have?

2. VULNERABILITY AND SHOCKS

Purpose: To build an understanding of what the external trends, shocks and seasonality are over which people have relatively little control but which affect/influence their livelihood strategies. The *vulnerability context* has a direct bearing on the hardships that poor people face. The fragility of poor peoples' livelihoods leaves them less able to cope with trends and shocks

Steps:
1. This session should take the form of an open discussion.
2. Ask the group the following questions:
   - Is this a good year or a bad year? Why?
   - Is this year better or worse than 3 years?
   - What is the most difficult time of year for you and why?
   - How do you manage during those months?
   - Have there been any shocks affecting the community i.e. drought, HIV/Aids, cyclones?
   - How did the community cope?
3. Feedback to the community what you have learned to ensure you have correctly interpreted their views.

3. TIME AVAILABLE & SEASONAL CALENDAR

HOW MUCH TIME IS AVALIABLE PER GENDER GROUP
Group should list their average daily activities, dawn until dusk, showing rest time as well as work time. What is the combined available time for a household to engage in market based activities?

SEASONAL CALENDER – TIME & ACTIVITIES
Group should draw a calendar by filling in a table, showing activities by season, and who carries them out, how long it takes and what crops are growing at that time.

Month/Season	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Season/rains												
Men's/women's workload												
Income generating activities												
Income - good months, bad months												
Expenditure – highs and lows												
Prices – highs and lows												
Markets – good months, bad months												
Human Disease												
Hard times												

What livelihood activities when												
Seasonal opportunities												

4. Ask how they cope during the particularly hard times and when household expenditures are highest? Do they have family and friends they can drawn from (social assets)? Do others cope the same way? Who doesn't cope during these times in the village? Why?
5. What do they do when they have particularly good times? How do they use additional incomes that may be generated at different times during the year?

4. PROBLEMS & CONSTRAINTS

Purpose: To identify problems and constraints to people achieving their livelihood goals.

Steps:
1. On cards list out problems
2. Give 3 stones to everyone
3. Ask them to place the stones next to the problem which causes them the most difficulties in their life.
4. Discuss the voting – where there less common problems ranked, if so who by and why?
5. See if they change their minds – redistribute following the discussion.
6. Discuss reasons for redistribution.
7. Discuss causes of these problems.
8. What opportunities might there be for improving different livelihood activities and addressing problems in the long-term? (by individuals, community, government).

5. INSTITUTIONS

Venn diagrams can be used to show the key institutions and individuals in a community and their relationships and importance for decision-making. Different circles indicate the institutions and individuals. When they touch, information passes between them. If they overlap a little there is some cooperation in decision-making. If they overlap a lot there is considerable cooperation in decision-making.

Purpose: To build an understanding of what the key institutions and individuals are in a community are and their relationships and importance for decision-making around livelihoods.

Steps:
1. Discuss the purpose of making a Venn diagram, namely to help community members and researchers to look at local and outside community institutions, and see to how they do or don't work together to meet the community's needs.
2. Find out from the group "Which organizations, in and outside the community are involved that particular livelihood activity.
3. Establish which of these are "more important" or "less important" organizations and why.
4. Explain that a circle will represent each organization they have mentioned. The more important the organization, the larger the circle should be.
5. Ask a community member to draw a large circle on the ground and label it with the name of the most important organization and go on from there.

6. LIVELIHOOD DISCUSSIONS

In separate groups (grown men, grown women, young men, young women)

Questions:

LIVELIHOOD ACTIVITIES
What livelihood activities?

1. From their comments pull together a list of the different livelihoods that the participants are engaged in. If more than 6 ask them to identify the 6 most important to them as a group.
2. Identify a list of criteria from each of the group members as to what is good about the livelihood activities/why they undertake a livelihood activity, for example:

- get good income from the activity
- does not take much time
- lots of resource
- access is good
- easy to do
- skills required
- can do year round
- brings additional/supplementary income

1. Ask the group to rank the criteria by importance.
2. Plot the activities across the top of a matrix and list the criteria down the side of the matrix listing the most important criteria first.
3. Give a certain number of stones for each criteria and ask the group to rank the activities by the criteria giving the most stones to the activity that best meets that criteria.
4. Add two additional criteria:
    - Access to livelihood activity
    - Institutions that had an influence over the livelihood activity.
5. Ask the community for each of the activities who in the community has access to the livelihood activity and which institutions influence that particular livelihood activity and make a note in the relevant boxes to their answers.
6. Discuss the findings with the group i.e. which activity is the most important, which is the next most important and so on.
7. Ask the group whether this is actually happening in the village or is it a desired preference that they aspire to.
8. Do they have any other livelihood preferences/aspirations? What are these?

Additional questions

- How much do spend as a household per month?
- How much income do you get per month?
- What livelihood activities do you get income from?
- Which livelihood activity brings you the most money?
- How much do you have left over each month per household?

6. FUTURE LIVELIHOODS AND AIG ACTIVITIES

Moving forward: the future

1. How do you propose to move forward?
2. Which livelihoods? Current? Alternative?
3. What has been tried and failed? Why?
4. Which possible partners?
5. What markets are available?
6. What are the logistical requirements?
7. What costs and benefits and limitations are perceived?
8. What land/labour/capital requirements?
9. How long will it take to set up?
10. Which community members would be involved? Which would not?

Note: start with their livelihood suggestions listed at start of discussion, and add your own as they begin to falter.

IUCN – Eastern African Regional Office
IUCN established the Eastern Africa Regional Office (EARO) in Nairobi in 1986. EARO facilitates the implementation of the IUCN Programme in Sudan, Eritrea, Djibouti, Somalia, Kenya, Tanzania, Comoros, Seychelles, Uganda and Ethiopia. Through its technical group, established in the early 1990s, the IUCN Programme assists members and partners in the region with capacity building through the implementation of programmes and projects, networking and technical advice. Specific areas of expertise include: protected areas, ecosystem management, biodiversity conservation, sustainable livelihoods, environmental planning and strategies, and support to environmental NGOs.

IUCN – Eastern African Marine and Coastal Ecosystems Programme
The aim of the IUCN's Eastern African Marine and Coastal Ecosystems Programme, which has been operating since 1992, is to maintain the biodiversity and ecological processes of marine and coastal ecosystems in Eastern Africa, to restore their functioning where this has been impaired, and to facilitate the sustainable and equitable use of marine resources. Current priorities include: the establishment and effective management of marine protected areas, sustainably managed fisheries, integrated coastal zone management and sustainable coastal livelihoods.

Dungonab Bay and Mukkawar Island Marine Park
Dungonab Bay and Mukkawar Island National Park's 800km2 area lies centrally on the 750km long Sudanese Red Sea coast, approximately 160km north of Port Sudan. The park includes land, coastal, reef and marine habitats which provide shelter to a number of species including manta ray, sharks, dolphin and the endangered dugong. The total length of coastline inside the park is over 200km and the two principal villages inside the park, Mohammed Qol and Dungonab, are home to 2,000 people.

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