EASTERN NILE TECHNICAL REGIONAL OFFICE

NBI – Institutional Strengthening Project

PROJECT DELINEATION AND PRIORITIZATION

MAIN REPORT

(FINAL REPORT)

4th June, 2011

CONTENTS

LIST OF ACRONYMS AND ABBREVIATIONS

CRA	Cooperative Regional Assessment
EDRI	Ethiopian Development Research Institute
ENSAP	Eastern Nile Subsidiary Action Programme
ENTRO	Eastern Nile Technical regional Office
EWDCD	Ethiopian Wildlife Development & Conservation Directorate
EWNRA	Ethiopian Wetlands and Natural Resources Association
FAO	Food and Agricultural Organization
GEF	Global Environmental Fund
GoS	Government of Sudan
HCENR	Higher Council for Environment and Natural Resources
IDEN	Integrated Development of the Eastern Nile
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
IMAWESA	Improved Management of Agricultural Water in East and Southern Africa
JMP	Joint Multipurpose Programme
Km	Kilometre
Km2	Square kilometre
MAB	Man and the Biosphere
MoA	Ministry of Agriculture
MCM	Million Cubic Meters
MWR	Ministry of Water Resources
NBI	Nile basin initiative
NTEAP	Nile Transboundary Environmental Action Programme

SCCSE	Southern Sudan centre for Census, Statistics and Evaluation
SWC	Soil and Water Conservation
t	ton
UESD	Unit of Environmental Studies and Development
UNDP	United Nations development Programme
ENESCO	United Nations Education, Scientific and Cultural Organisation
USAID	United States Agency for International Development
WBISSP	Woody Biomass Inventory & Strategic Planning Project
WCGA	Wildlife Conservation General Administration
WSM	Watershed Management

DISCLAIMER

The maps in this Report are provided for the convenience of the reader. The designations employed and the presentation of the material in these maps do not imply the expression of any opinion whatsoever on the part of the Eastern Nile Technical Office (ENTRO) concerning the legal or constitutional status of any Administrative Region, State or Governorate, Country, Territory or Sea Area, or concerning the delimitation of any frontier.

ACKNOWLEDGEMENTS

The Consultant wishes to thank staff members of ENTRO for their very valuable comments and recommendations made at a Workshop held at ENTRO. Also members of the WSM Secretariats of Ethiopia and Sudan for comments and recommendations made at workshops held in Adama'a (Nazereth), Ethiopia and Khartoum (Sudan) respectively. Finally, the Consultant wishes to thank all Stakeholders met at the various Project locations in Ethiopia and Sudan who provided extremely valuable information and insights into issues of the various Projects.

1. BACKGROUND

The results of the Trans-boundary, Distributive and Cooperative Mechanisms Analyses of Eastern Nile Watershed Management Cooperative Regional Assessment (CRA) provided a broad understanding of:

- the baseline conditions in each watershed, root causes of land degradation on national level and lessons from past experience in watershed management,
- each of the selected sub-basins as "*integrated"* watershed systems,
- the challenges and opportunities for cooperative watershed management,
- the cumulative costs and benefits of alternative watershed management interventions,
- the potential distribution of costs and benefits under alternative benefit sharing scenarios, and
- the nature and scope for generating regional public goods[1] through the watershed management project(s).

The Watershed Management CRA terms of reference called for the identification:

> *through analysis, the next round of watershed management projects, that are promising from a local livelihoods as well as a regional benefits point of view and are rational in view of anticipated multipurpose developments in the Eastern Nile region .*

[1] A regional public good here can be seen as the positive 'spill-over' effects of a country-level activity or asset in neighbouring countries.

The Distributive Analysis identified a comprehensive set of watershed management interventions to be implemented within Ethiopia, Sudan and Egypt. The majority of these had substantial in-country benefits in terms of reducing poverty, sustaining livelihoods and arresting the decline in the integrity of the natural resource and environmental base of the countries concerned. A number of these had regional and global benefits. Many of the interventions identified were, or were likely to be in the future, integral parts of on-going development programmes.

The Cooperative Mechanisms Analysis examined a continuum of increasing levels of potential cooperation amongst the three riparian countries of the Eastern Nile Basin. These ranged from uni-lateral action with no cooperation through coordination (e.g. of information collection and sharing), collaboration (e.g. collaborative research or collaborative Watershed Management Planning) to Joint Activities (e.g. administration of Trans-boundary National Parks). With-in this framework many of the interventions outlined in the Distributive Analysis required a relatively low level of cooperation between the riparian countries, notwithstanding downstream (i.e. regional or Global benefits that could accrue to them.

A number of criteria were identified to enable a selection to be made of a first round set of potential projects from those identified in the Trans-boundary Analysis and outlined in the Distributive Analysis.

- Support and enhance cooperation among the three Riparian Countries in sustainable watershed management,

- Local, National, Regional and where possible Global benefits would accrue to the projects, and

- The projects would where possible support other IDEN Projects, the JMP and other NBI projects.

- The projects would address threats to Environmental and Natural Resource Hotspots

The "Benefits" criterion was broad in its interpretation. Benefits included positive impacts on (i) poverty reduction, (ii) support to sustainable livelihoods and reducing vulnerability, (iii) reducing or arresting natural resource degradation. Benefits accruing to these development goals are inextricably

linked and were thus, considered together. Benefits were also assessed at the local/national, Regional/Eastern Nile Basin and the Global scales. All selected Projects have benefits at all three levels. All Projects selected also support to a greater or lesser extent on-going or proposed Projects within the NBI or ENSAP framework.

Two sets of follow-on projects were identified:

- National Investment Projects
- Cooperative Knowledge Development Projects.

The main criteria for the selection of the Investment Projects was that they addressed current threats to natural resource degradation in ways that negatively impacted on local household livelihoods and also negatively impacted on downstream river users.

This Consultancy is concerned with ten of the Investment Projects located within the Main Nile Sub-basin, the Tekeze-Atbara Sub-basin and the Baro-Akobo-Sobat Sub-basin. Those Projects that were identified in the Abay-Blue Nile Sub-basin are being considered separately.

2. OBJECTIVES AND SCOPE

The objective of the study is:

"*to define watershed investment projects from the broadly identified "hot spot" areas by the CRA Study for Watershed Management for detailed project preparation. The assignment involves the delineation of each hot spot area into sub-watersheds of manageable size and to prioritize them on agreed criteria.*"

Ten watershed management projects have been selected by ENTRO for delineation, project development and prioritization. Each delineated sub-watershed is described in terms of socio-economic and biophysical characteristics. Full reports have been compiled and it is envisaged that ENTRO will subsequently mobilize resources for the eventual preparation of the prioritized projects in collaboration with the ENSAP Teams.

3. APPROACH AND METHODOLOGY

Stakeholder participation and the adoption of an integrated watershed management approach were essential elements that were adopted in the approach.

The delineation of the target sub-watersheds was undertaken through a document review and field assessment. This involved reviewing the information provided by ENTRO including:

- Country Analysis Reports for Egypt, Ethiopia and Sudan,
- Trans-boundary Analysis Reports for the Baro-Akobo-Sobat, Abbay-Blue Nile, Tekeze-Atbara and the Main Nile Sub-basins,
- Distributive Analysis,
- Watershed management in the Eastern Nile Basin: Constraints and Challenges, and
- Project profiles.

An important activity of the assignment was the development of a list of criteria for prioritizing and ranking the ten Projects. This was undertaken in a sequential manner. An initial list of criteria was developed from the criteria that were used in the original CRA Watershed Management Programme Report. This provided guidance on the type and level of information to be collected for the purpose of micro-catchment delineation. The criteria were subsequently refined through a process of consultation with relevant stakeholders.

Additional information was collected on the ten sub-watersheds. This information was obtained through a document review and field data collection. It was not possible to make field visits to Egypt and southern Sudan. This was reviewed, analyzed and collated. Information was collected on past and on-going projects and programmes in each of the sub-watersheds to determine lessons learnt and allow focused assessments of issues, challenges and project interventions.

From the above analysis a provisional delineation of each project was made into Watersheds of manageable size (i.e. 1,000 – 2,000 km2). Further consultation with relevant stakeholders may require some modifications to the specific delineations.

Key issues, challenges and potentials for each of the ten micro-watersheds were identified from the documentary and field information analysis and from the Stakeholder consultation.

4. REVIEW OF PROJECT PROFILES AND DELINEATION OF INVESTMENT PROJECTS

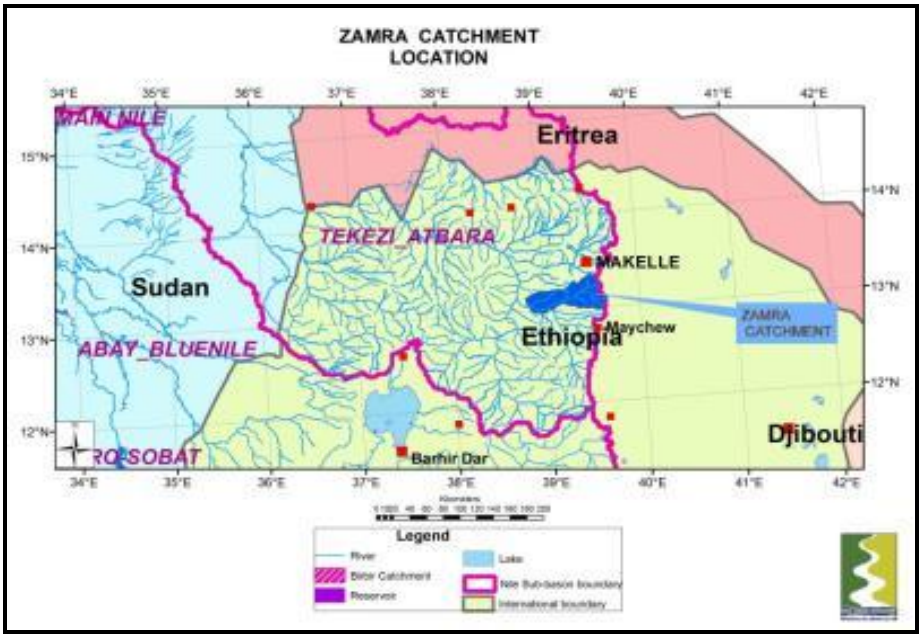
PROFILE 1. Integrated Watershed Management – Tekeze Sub-basin, Upper Zamra Catchment, Ethiopia

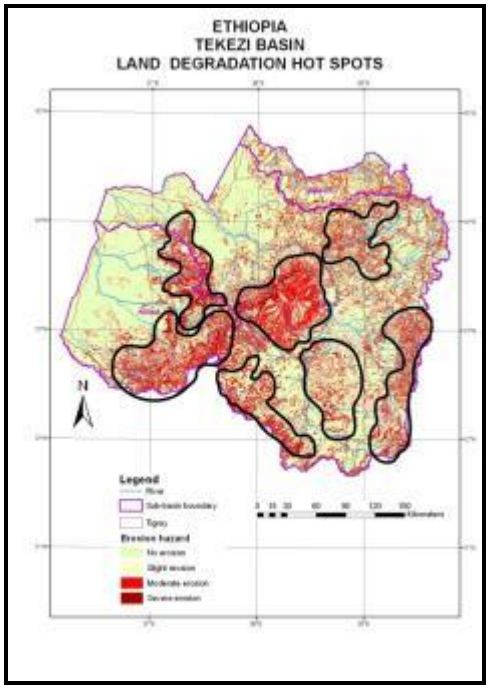
Location

The Zamra Catchment is located in the south-eastern part of the Tekeze-Atbara Sub-basin and is some 1,658km^2 in extent. An adjoining Watershed: the Arequa Watershed is being examined as a possible follow up Project. It covers some 1,269 km2. The Project area is located entirely within Tigray Regional State.

Reason for Selection

The Watershed Management CRA identified a number of land degradation hotspots in the Tekeze Sub-basin. These are areas of increasing population pressure on a degrading natural resource base, increasing food insecurity, with increasing household inability to invest in sustainable land management practices due to declining household and community natural, physical, social and human capital assets. The selected hotspots are located in areas of low agricultural potential where land degradation processes (erosion and soil nutrient depletion) are severe and of long standing.





Information Present

Information on the Tekeze Basin is available in the WSM CRA Country Report on Ethiopia (Tekeze Sub-basin), the Trans-boundary Report on the Tekeze-Atbara Sub-basin, the Distribution Analysis Report (chapter on Tekeze-Atbara Sub-Basin and the Ethiopian Ministry of Water Resources (MWR) Tekeze Basin Master Plan.

Additional Information

The Zamra Catchment encompasses two woredas: Hintalo Wejirat and Saari Samre with some 26,140 and 21,900 rural households respectively. Information at this level is available from the Central Statistical Agency's (CSA) Agricultural Census (2001) and from the Woreda level Geographic Information System (GIS) data base of the Woody Biomass Inventory and Strategic Planning Project (WBISPP). The former includes data on crop and livestock production and farming practices. The latter includes potential soil loss rates on crop and non-cropland, wood and herbaceous biomass stocks and annual production rates.

Much research work has been undertaken on soil erosion by (i) the Soil Conservation Research Project (SCRP) supported by the University of Berne, Switzerland and (ii) by the University of Makelle supported by the University of Leuven, Belgium. Both projects provide a wealth of information on soil loss rates, their impact on crop production and the efficiency of SWC structures.

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Lessons learnt

There are a number of studies specific to the Project area that provide useful "lessons learnt". Nyssen et al. (2007) provide a detailed summary of 10 years of research into soil and water conservation and lessons learnt. Landell Mills (2004) undertook a detailed evaluation of (EU Funded) water harvesting schemes in selected woredas in Tigray Region that included Hintalo Wejirat and Saari Samre woredas. IFAD (2005) provides a detailed evaluation of IFAD supported small-scale irrigation schemes in Tigray that also include the two Zamra Catchment woredas. The International Food Policy Research Institute (IFPRI) and the Ethiopian Development Research Institute (EDRI) have undertaken a number of detailed socio-economic studies into land degradation and its impacts in Tigray (Hagos et a., 1999, Pender et al. 2001). FAO undertook a study of female headed households and Communal Natural Resources in Hintale Wejirat woreda (Howard and Smith, 2006) that provides a very useful insight into women's access (or lack of it) to communal natural resources.

Other Projects/Programmes in the Zamra Catchment

Tigray Region has a comprehensive soil and water conservation (SWC) programme. Both woredas fall within the Productive Safety Net Programme PSNP) of the Ethiopian Food Security Programme, which provides substantial support through guaranteed employment to chronically food insecure households. This employment is focussed on public works such as soil and water conservation, farm-to-market roads, small-scale irrigation.

In the two focus woredas the largest NGO programme is that of the Relief Society of Tigray (REST) that has a comprehensive development programme covering agricultural development and WSM. IFAD supports the small-scale irrigation and the EU supports water harvesting activities

Key Issues

The Catchment is extremely dissected and land degradation is severe. With high erosion rates, low vegetation cover and high sediment delivery ratios the Catchment makes a major contribution to the suspended sediment load of the Tekeze River. The catchment is upstream of the TK% hydro-electric dam. The catchment is of low agricultural potential because of low and variable rainfall. The incidence of poverty is very high. Much of the catchment is relatively inaccessible given the dissected nature of the terrain.

Project Stakeholders

Primary Project Stakeholders: **These include the following:**

- Rural agricultural households residing within the Zamra Watershed with land holdings for cropping and access to communal grazing and forested lands;
- Landless rural households residing within the Zamra Watershed who have access to communal lands for collection of fuelwood, medicinal herbs and water;
- Staff of the Bureau of Agriculture and Rural Development who will receive technical and logistical support.

Secondary Project Stakeholders: include:

- Operators of the TK5 dam who will benefit from reduced rates of sedimentation in the reservoir.

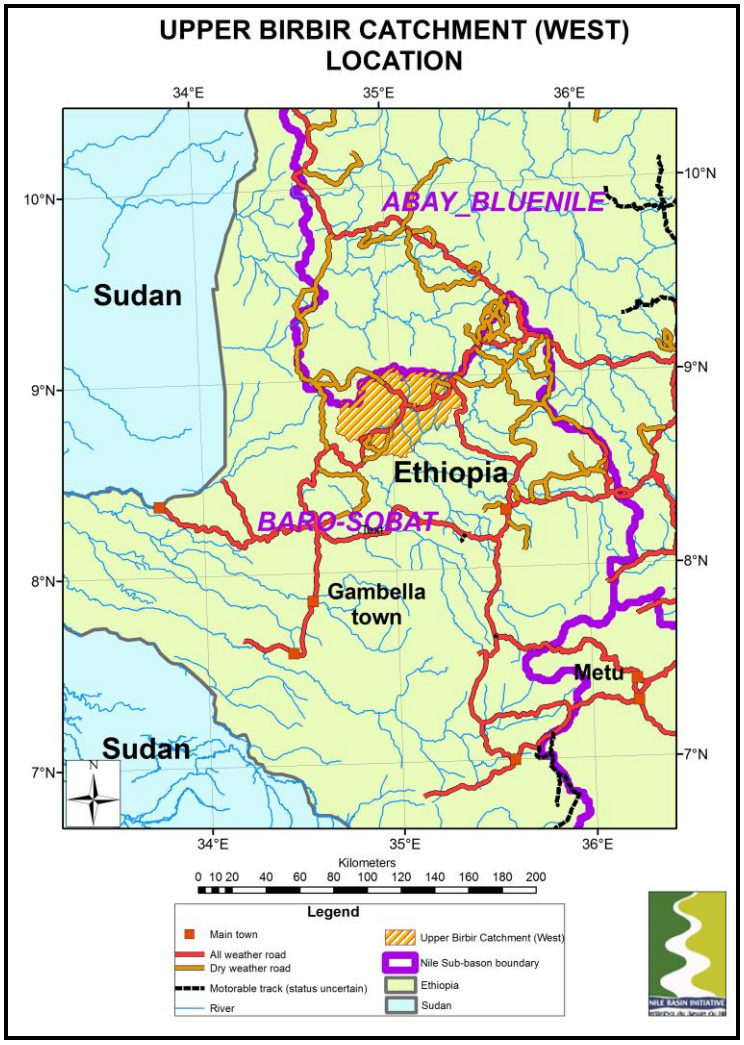
Objectives

The objective of this Project is to provide support to the Regional Government to arrest severe land degradation hotspots within areas of low agricultural potential in the Zamra Catchment of the Tekeze Sub-basin, strengthen household and community livelihood strategies and contribute to the alleviation of poverty.

Profile 2: Baro-Akobo Sub-basin: Upper Birbir Watershed (West): Integrated Watershed management

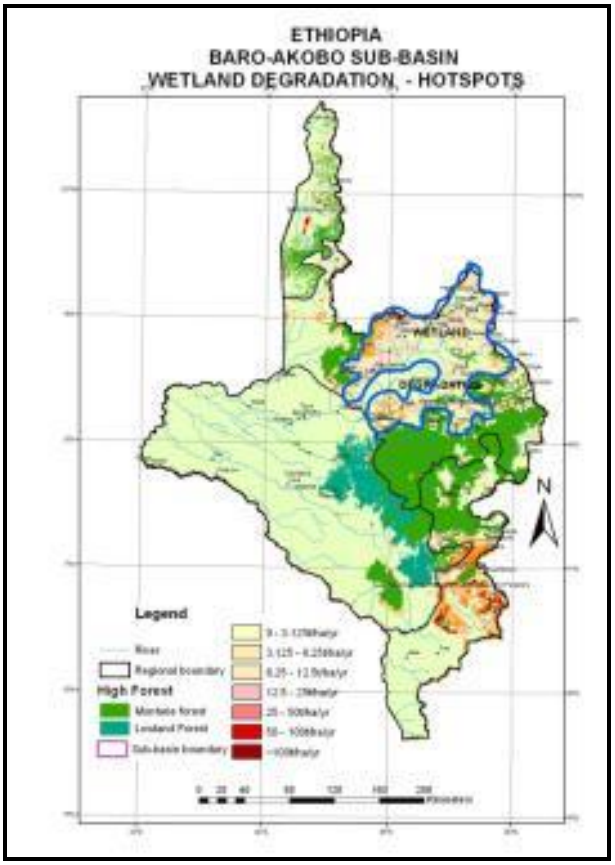
Location

The Upper Birbir Catchment (West) is located in the north-eastern part of the Baro Sub-basin and is some 2,567 km^2 in extent. It is located on the eastern slopes of Mount Tulul Welel.



Reason for Selection

The Watershed Management CRA has identified a number of land degradation hotspots in the Baro-Akobo Sub-basin. These are areas of increasing population pressure on a degrading natural resource base, increasing food insecurity, with increasing household inability to invest in sustainable land management practices due to declining household and community natural, physical, social and human capital assets. Whilst the selected hotspots are located in areas of relatively high potential land degradation processes (erosion and soil nutrient depletion) are severe.



Information Present

Information on the Baro-Akobo-Sobat Basin is available in the WSM CRA Country Report on Ethiopia (Baro-Akobo Sub-basin), the Trans-boundary Report on the Baro-Akobo-Sobat Sub-basin, the Distribution Analysis Report (chapter on the Baro-Akobo-Sobat Sub-Basin and the Ethiopian Ministry of Water Resources (MWR) Baro-Akobo Basin Master Plan.

Additional Information

The Upper Birbir Catchment mainly encompasses three Woredas in Oromiya Region: Dile Lalo, Gawo Dale and Hawa Welel, each with 27,372, 51,604 and 23,937 rural households respectively.[2] Information at this level is available from the Central Statistical Agency's (CSA) Agricultural Census (2003) and from the Woreda level Geographic Information System (GIS) data base of the Woody Biomass Inventory and Strategic Planning Project (WBISPP). The former includes data on crop and livestock production and farming practices. The latter includes potential soil loss rates on crop and non-cropland, wood and herbaceous biomass stocks and annual production rates.

[2] For year 2010 estimated from 1993 census with annual increase of 2.5%.

Bourne (2001) has studied the farming systems of West Wellega in relation to agricultural expansion and tsetse control.

The Ethiopian Wetlands and Natural Resource Association (EWNRA, 2000) have assessed the value of wetlands to livelihoods in West Wellega Zone, which covers the project area.

Lessons learnt

The Soil Conservation Research Project had an experimental micro catchment near Metu, which has similar soils and climate, for which information on soil loss rates and land use practices is available. IFPRI undertook a review of Land Degradation in the Oromiya Region (Bezuaye Tefera et al.2001) which covers the Project area.

The three woredas are receiving areas for the Government's Voluntary Resettlement Programme. Those in Hawa Welel woreda have been studied by Reta Assegid (2008) and Yonas Guteme (2010).

Other Projects/Programmes in the Birbir Catchment

No information is available on other projects within the three woredas.

Key Issues

Expanding agriculture has destroyed much of the forest leaving all but a small area of forest in the highest parts of the Catchment. The Catchment suffers from severe soil erosion and the degrading resource base is contributing to increasing food insecurity notwithstanding the relatively high agricultural potential. Population pressure is being exacerbated by in-migration of people under the Government's voluntary Resettlement programme.

Project Stakeholders

Primary stakeholders include the following:

- Rural agricultural households residing within the Upper Birbir Watershed with land holdings for cropping and access to communal grazing and forested lands;

- Landless rural households residing within the Upper Birbir Watershed who have access to communal lands for collection of fuelwood, medicinal herbs and water;
- Registered households residing in the official Voluntary resettlement Areas within the Upper Birbir watershed;
- Staff of the Bureau of Agriculture and Rural Development who will receive technical and logistical support.

Secondary Project Stakeholders include:

- Downstream water users within and below the Upper Birbir Watershed who will benefit from reduced sediment loads;

Objectives

The objective of this Project is to provide support to the Oromiya Regional Government to arrest severe land degradation hotspots within areas of high agricultural potential in the Upper Birbir Catchment (West) in the Baro-Akobo Sub-basin, strengthen household and community livelihood strategies and contribute to the alleviation of poverty.

PROFILE 3. Participatory Development and Management of Small catchments for Sustainable Agricultural, Wetlands and Forest Management, Sor Catchment in the Upper Baro Sub-basin, Ethiopia.

Location

The Sor Catchment is located in the Upper Baro Sub-basin to the south of the Upper Birbir Catchment and covers some 2,449km2.

Reason for Selection

The Highlands of the upper Baro-Akobo are a mosaic of forest patches, upland cropland and grazing land and valley-bottom swamps – many of which are being drained for crop production. The area is under increasing population pressure and has varying, but growing, levels of food-insecurity.

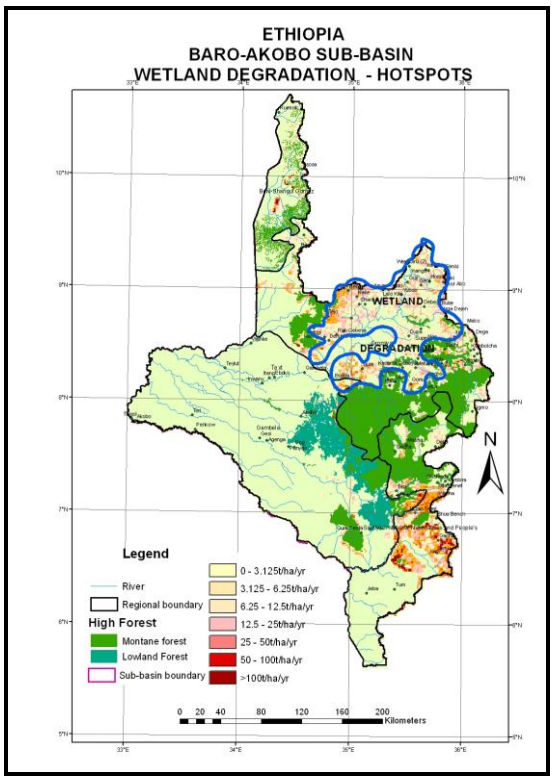


Fig. 1 Multiple Use Wetland, near Metu.

Information Present

Information on the Baro-Akobo-Sobat Basin is available in the WSM CRA Country Report on Ethiopia (Baro-Akobo Sub-basin), the Trans-boundary Report on the Baro-Akobo-Sobat Sub-basin, the Distribution Analysis Report

(chapter on the Baro-Akobo-Sobat Sub-Basin and the Ethiopian Ministry of Water Resources (MWR) Baro-Akobo Basin Master Plan.

Additional Information

A local NGO, the Ethiopian Wetlands and Natural Resources Association (EWNRA) and the University of Huddersfield (UK) have been working on supporting local communities to sustainably manage wetlands for livelihoods improvement. They have produced a number of documents regarding both research and experienced gained. (See list of documents in Annex 1.)

Lessons Learnt

In addition to experienced gained by EWNRA, Menschen fur menschen have also been working in the area over many years and have also gained experience in developing wetlands.

Key Issues

With mean annual rainfall exceeding 1,500 mm/yr the area has been identified as having good micro-hydro power potential. The valley-bottom swamps are located in micro-catchments at the top of a nested-hierarchy of hydrologically linked micro-catchments and sub-catchments that comprise the Upper Baro-Akobo Sub-basin. Whilst, currently only 5-15 percent of these swamps have been drained for crop production with increasing land pressure and food-insecurity the pace of swamp conversion is likely to accelerate.

A sustainable approach to swamp development for multiple uses has been developed by a local NGO based on traditional practices, a scientific study of ecological succession and governed by local institutions. On the uplands, community-based approaches to participatory forest management have also been developed. Related developments have taken place with respect to sustainable harvesting, improved marketing and quality control of non-timber forest products. In particular, the development of the production, quality control, certification and improved marketing of organically produced coffee is also receiving attention. There is a need to bring all these separate development initiatives together through a process of participatory land use planning at the micro-watershed level but which then integrates these into the overall planning and development at the Sub-catchment level to ensure equitable access to water across the Sub-catchment. This process would be linked to the proposed land use zoning of the remaining High Forest areas.

This two tiered level of watershed management planning would ensure that larger investments such as mini hydro power developments and lowland irrigation would be assured of sufficient water. Additionally, infrastructural developments such as improved road access to markets and crop processing plants would form an integral part of the overall Sub-catchment development. This two tiered approach to watershed management is only just now beginning to receive attention. Previous approaches initially used the Sub-catchment as the only level of development, which were then changed to the micro-catchment approach. There is a need to integrate the two approaches and increase the role for community participation with market incentives.

Other programmes

Two key on-going projects are those being supported by Menschen fur Menschen and EWNRA.

Project Stakeholders

Primary stakeholders include the following:

- Rural agricultural households residing within the Sor Watershed with land holdings for cropping and access to communal grazing and forested lands;
- Landless rural households residing within the Sor Watershed who have access to communal lands for collection of fuelwood, medicinal herbs and water.
- Staff of the Bureau of Agriculture and Rural Development who will receive technical and logistical support.

Secondary Project Stakeholders include:

- Downstream water users within and below the Sor Watershed who will benefit from reduced sediment loads;

Objectives

The objective of this project is to provide support to developing a participatory two tier approach to sustainable development and management of Sub-catchments and their Micro-catchments in the Southwestern Ethiopian Highlands of the Sor Catchment in Upper Baro Sub-basin and through the utilization of Community Development Funds implement Community level Micro-catchment Management Plans. The project would also support the establishment of the higher level institutional procedures and organization to facilitate coordination at the Sub-catchment level. These interventions will support sustainable livelihoods and contribute to poverty alleviation.

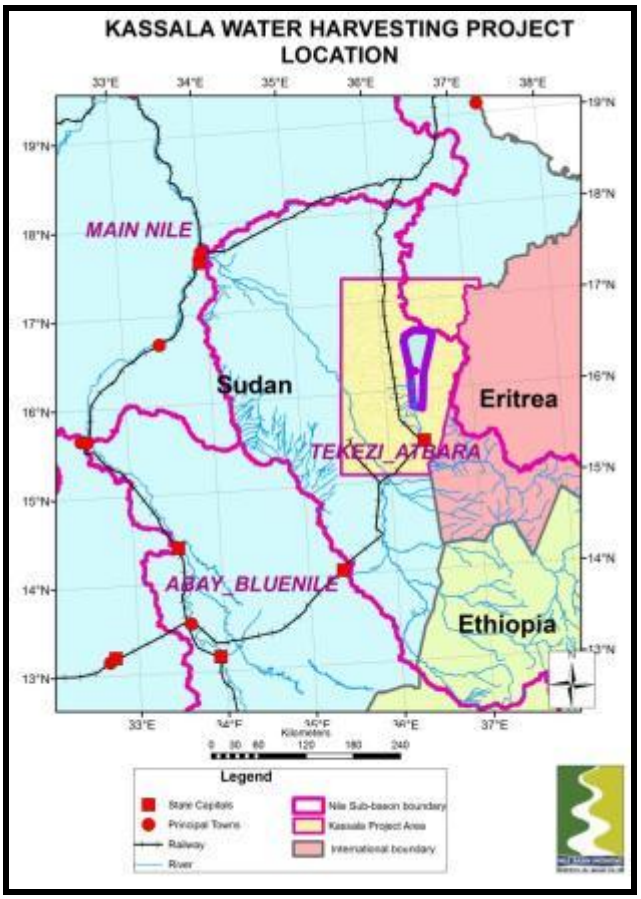
PROFILE 4. Support to Water Harvesting in the Semi-Arid Areas of Telkuk Locality in Kassala State, Main Nile Sub-basin, Sudan.

Location

The project is located north of Kassala town in Telkuk Locality, to the east of the Gash Delta to the border with Eritrea. It comprises a series of wadis or khors draining from the Red Sea Hills to the Gash River. The project Area covers some 1,900km2.

Reason for Selection

On the plains east and west of the Gash Delta in the "Border Area" and extending southwards onto the Butana Plains agro-pastoralists, sedentarized former pastoralists (mainly Beja but increasingly Rashyda peoples) and recent immigrants from West Africa use a number of run-off farming techniques (van Dijk & Mohamed, 1993, Critchley et al., 1988).



The structures require considerable for their maintenance and frequent re-construction. There is a need to explore more cost-effective ways *tera* construction and reconstruction. The areas are relatively inaccessible and there is a need to improve market accessibility. Because of poor accessibility crop types are confined to pure subsistence types and because of the use of unimproved seed crop yields are low.

Information Present

Information on the Main Nile Sub-Basin is available in the WSM CRA Country Report on Sudan (Main Nile Sub-basin), the Trans-boundary Report on the Main Nile Sub-basin and the Distribution Analysis Report (chapter on the Main Nile Sub-Basin.

Additional Information

Additional information is available from the study reports by Van Djik and Ahmed (2001), van Djik and Reij (2002) resulting from the Netherlands supported water spreading research project (WARK). Neimeijer (1998) studied the impacts of the water harvesting structures in trapping nutrients and organic matter.

Other information is available from the Sustainable Livelihoods Analysis survey for the IFAD supported Gash Delta Sustainable Livelihoods Rehabilitation Project (IFAD, 2002). IFAD also undertook a land and water governance study (IFAD, 2004) that provides useful information the land and water institutional aspects. The Nile Integrated Water Resource Management Net (IWRM-NET, 2009) provides some data on the Gash River Catchment. Kirby (2001) describes in detail the environmental degradation processes occurring within the Gash Delta and its surrounding area.

The Pastoral and Environmental Network in the Horn of Africa (PENHA) undertook a baseline survey for women in the Project area (Gobara et al. 2009).

Other Programmes

The most relevant project is the Water Spreading Research Project being implemented by the Kassala Department of Soil Conservation, Land Use and Water Programming (SCLUWP) in the Ministry of Agriculture and Natural resources. The IFAD supported Gash Delta Livelihoods rehabilitation project is also very important. The Kuwait Fund has been supporting water harvesting

activities as part of its over development programme in Kassala State. A local NGO “Practical Action” is also supporting water harvesting activities.

Lessons Learnt

The most relevant information on lessons learnt emanates from the WARK Project mentioned above. In addition the IFAD project also mentioned above has gained considerable experience in the institutional development of sustainable local land and water management organizations.

A study undertaken under the auspices of the organization “Improved Management of Water in Eastern and Southern Africa (IMAWESA) drew a number of useful lessons learnt of IFAD supported water harvesting projects in both Kassala State in Sudan and the Gash-Barka area across the border in Eritrea.

The Organization for Social Science in Eastern and Southern Africa (OSSREA) is supporting a Dry Land Husbandry Project in Kassala State between 1997 and 2003 that covered water harvesting and rangeland re-seeding and from which useful lessons were learnt.

Stakeholders

The Primary Project Stakeholders include:

- Pastoral and Agro-pastoral households from the various ethnic groups from within and outside the Project Area who use the grazing lands within the Project Area.
- Agricultural households who focus mainly on crop production within the Project Area.
- Staff of the Kassala State Ministry of Agriculture, Ministry of Livestock Production and Ministry of Irrigation who will receive increased technical and logistical support.

The Secondary Project Stakeholders include:

- Pastoral and agro-pastoral households from outside the Project Area who will benefit from reduced conflict over grazing resources because Group grazing areas have been clearly defined in the participatory Community and Strategic level land Use Planning.

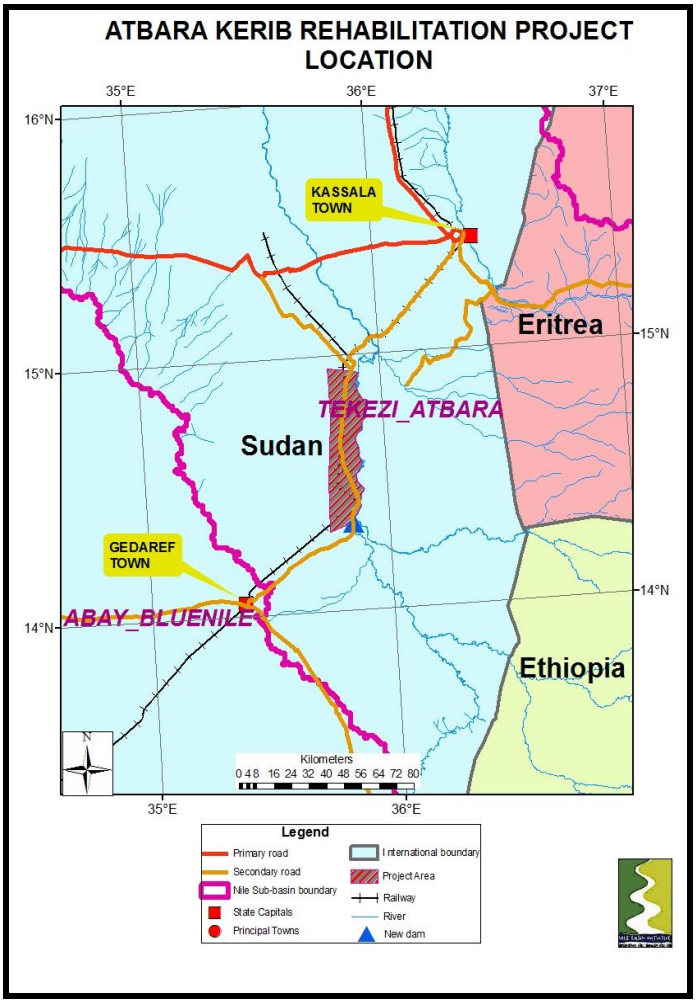
Objectives

The objects of the project are to provide support to small-scale farmers to improve the efficiency of their traditional water harvesting structures (e.g. *teras*) for cereal and vegetable production and increase production through supply of improved seed, thereby strengthening household and community livelihood strategies and contributing to the alleviation of poverty.

PROFILE 5. Restoration of Kerib Land along Upper Atbara River, Sudan.

Location

The overall Project area comprises the kerib badlands located along the south bank (Gedaref State side) of the Atbara River between the Kashm el Girba dam and the proposed new dam to be located at the junction the the Setit and Barr as Salem Rivers.



Reason for Selection

The key problem with erosion in Sudan part of the Atbara Sub-basin is the gully erosion along the banks of the Atbara River. This erosion leaves behind land known as "kerib" land. The Setit and Atbara Rivers as they leave Ethiopia are incised below the adjoining plains by about 30 – 50 meters. The plains are overlain with Vertisols (black cracking clays). The Vertisols develop very wide cracks during the dry season. At the onset of the rains water enters the cracks. Whilst the soils are covered with deep rooted vegetation there is no problem as roots take up any excess sub-soil water.

However, once this vegetation is removed there is excess water in the subsoil and tunnels develop in the subsoil. These eventually collapse leaving an incipient gulley. These gradually extend back into the plain stripping the soil away from the underlying weathered rock. The weathered rock is quickly gullied. It is estimated from examining successive landsat satellite images that the kerib land is stripping back at a rate of 100 meters a year, which is 10 hectares per kilometer on each side of the river or approximately 3,000 hectares of land a year in total. Most of this land lost is under cultivation.

A survey undertaken in 1990 estimated 300,000 feddans (1,680 km^2) of kerib land. An interpretation of 2005 Landsat TM imagery gave an estimate of 359,286 feddans (2,012 km^2), of which some 145,536 feddans (815 km^2) are above the Kashm el Girba dam and 213,759 feddans (1,197 km^2) below.

Information Present

Information on the Atbara Sub-Basin is available in the WSM CRA Country report on Sudan (Atbara Sub-basin), the Trans-boundary Report on the Tekeze-Atbara Sub-basin and the Distribution Analysis Report (chapter on the Tekeze-Atbara Sub-Basin.

Additional Information

There is little additional information on the kerib land and its formation. The most detailed is that of Fadul et al. (1999) who measured the rate of kerib land formation along the Atbara and Bar as Salem Rivers. Ibrahim et al., (1999) investigated the extent of the two main groundwater basins in the Showuk area. ElHaj El Tahir et al. (2010) have used satellite imagery to map the extent of gulley erosion along the Blue Nile in Sudan. Seid Ahmed (2002) has studied gully formation in the Showuk area, the use cut-off drains to reduce incipient gullying and the identification of suitable trees for rehabilitation. Seid Ahmed et al. (2009) have measured the impacts of gully erosion in the

Showuk area on sorghum yields. Nasr (2005) in his Ph.D. studied in detail the kerib land along the Setit-Atbara.

Other Programmes

The current on-going project is the EU supported Eastern Sudan Rehabilitation and Development Project. This project is working in Showuk supporting community forestry. However, this project is due to phase out in 2012.

Lessons Learnt

Seid Ahmed's (op. cite 2002) study reports the effects of instituting cut off drains to reduce gully erosion. USAID's midterm review (Resch et al., (1985) describes lessons learnt from the Eastern Refugees Re-forestation Project in Gederef State in the 1980's in establishing and managing nurseries and of tree planting.

The experience in Ethiopia along the upper Bilate River in the Rift valley of rehabilitating extensive gullying and "stripping" of soil and the underlying soft volcanic ash derived sediments is applicable in the case of kerib land restoration.

Key Issues

There are two key issues in initiating any programme of arresting kerib land formation and its subsequent reclamation. The first is the compensation and reallocation of land to farmers whose land is used as the buffer zone to arrest kerib formation. The second is the question of land tenure of the reclaimed kerib land. Whilst community division and allocation of land is the current policy, consideration should be given to allocating the kerib land on an individual basis.

Project Stakeholders

The Primary Project Stakeholders are the rural agricultural households who live within 10 kms of the Atbara River kerib land in El Fashaga Locality of Gedaref State, between the Kashm el Girba dam and the proposed new dam at the confluence of the Setit and Bares Salem rivers. These can be divided into a number of sub-catagories as follows:

- Smallholder farmers whose crop land is in immediate or medium term danger of gullying and destruction;

- Rural households El Fashaga Locality whose crop land is not in immediate or medium danger of gullying but who depend on the kerib land for either grazing or fuelwood (or both);
- Rural households with no crop land but depend on the kerib land for either grazing or fuelwood (or both);

Secondary Stakeholders include:

- Staff of the Gedaref State Ministry of Agriculture who require technical and logistical support based at Locality and at State levels.
- Ministry of Irrigation who are responsible for the Kashm el Girba dam and the New Halfa Irrigation Scheme.
- Irrigators on the New Halfa Scheme who are experiencing reduced water availability because loss of storage capacity in the Kashm el Girba reservoir.

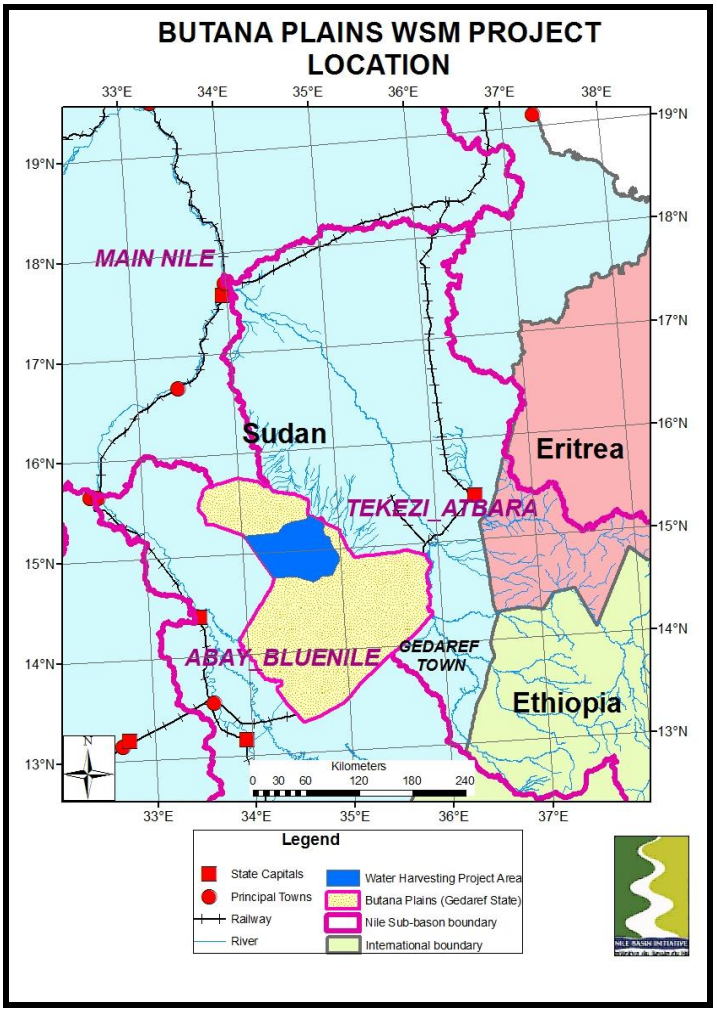
Objectives

The objects of the project are to provide support to arresting the gully erosion and restoring the productive capacity of the kerib land along the Upper Atbara for tree and forage production. These interventions will support sustainable livelihoods and contribute to poverty alleviation.

PROFILE 6. Reducing Rangeland Degradation and Improving Livestock Productivity in the Butana Plains, Atbara and Blue Nile Sub-basins, Sudan.

Location

The overall Project area comprises the Butana Plains within Gedaref State. Within this area a more focussed area has been defined for Water Harcesting activities. This latter area comrprises some 4,990 km^2.



Reason for Selection

The Butana has been described as the best rangeland for camels and sheep. This was largely due to the occurrence of good grazing fodder. However, these areas have been heavily grazed and have almost lost some of its valuable plant species such as *Belpharis spp.* Much valuable grazing land has been lost due to encroachment by large semi-mechanized farms that have cut off access to the dry season grazing lands in the south east.

Information Present

Information on the Butana Plains is available in the WSM CRA Country Report on Sudan (Blue Nile and Atbara Sub-basins), the Trans-boundary Reports on the Abbay-Blue Nile and the Tekeze-Atbara Sub-basins, the Distribution Analysis Report (chapters on the Abbay-Blue Nile and the Tekeze-Atbara Sub-Basins.

Additional Information

Two detailed studies on the extent and causes of natural resource degradation of the Butana Plains can be found in the Ph.D. study by Muna Mohamed Elhag (2006) and the detailed study by Mariam Akhtar (Akhtar, 1993). Sammani et al. (2002) provide a summary of the complex land tenure system operating in the Butana area. Mirreh (2003) provides a detailed description of the vegetation patterns of the Butana. Kirk (1994) describes in detail the process of change from a well-organized communal rangeland management institution to an open access regime after 1971 due to fundamental changes in the land tenure institutions.

Studies on Butana camel production, nutrition and diseases are found in Darosa and Agab (2003). FAO (2002) describe the characteristics of the Butana breed of cattle.

Other Programmes

Two IFAD supported projects are the Butana Rural Development Project and the Butana Rural Roads project. The former is supporting improved livestock and crop production, improved access to crop and livestock markets and institutional and capacity building. It will be implemented between 2008 and 2014.

Lessons Learnt

Elsadig et al. (2008) describe the positive impacts of implementing water harvesting techniques on rangeland quality in the Butana. Muna Ahmed et al. (2004) details lessons learnt in the OSSREA supported Drylands Husbandry Project implemented in the Butana area. Glover (2005) evaluates various forest management systems in Gederef State. Wallach (2004) provides a comprehensive assessment of grassland improvement projects and programmes undertaken over 50 years in northern Sudan. Zaroug (2006) provides detailed information on the opportunities available for rangeland improvement in the Butana.

Project Stakeholders

The Primary Project Stakeholders include:

- Pastoral and Agro-pastoral households from the various ethnic groups who use the wet season grazing lands on the Butana Plains within Gedaref State.

- Agricultural households who focus mainly on crop production within the wet season grazing lands of the Butana Plains within Gedaref State.
- Staff of the Gedaref State Ministry of Agriculture, Ministry of Livestock Production and Ministry of Irrigation who will receive increased technical and logistical support.

The Secondary Project Stakeholders include:

- Large-scale mechanized farmers who will experience reduced crop damage from livestock passing through their farms from and to the wet season grazing lands of the Butana Plains within Gedaref State.

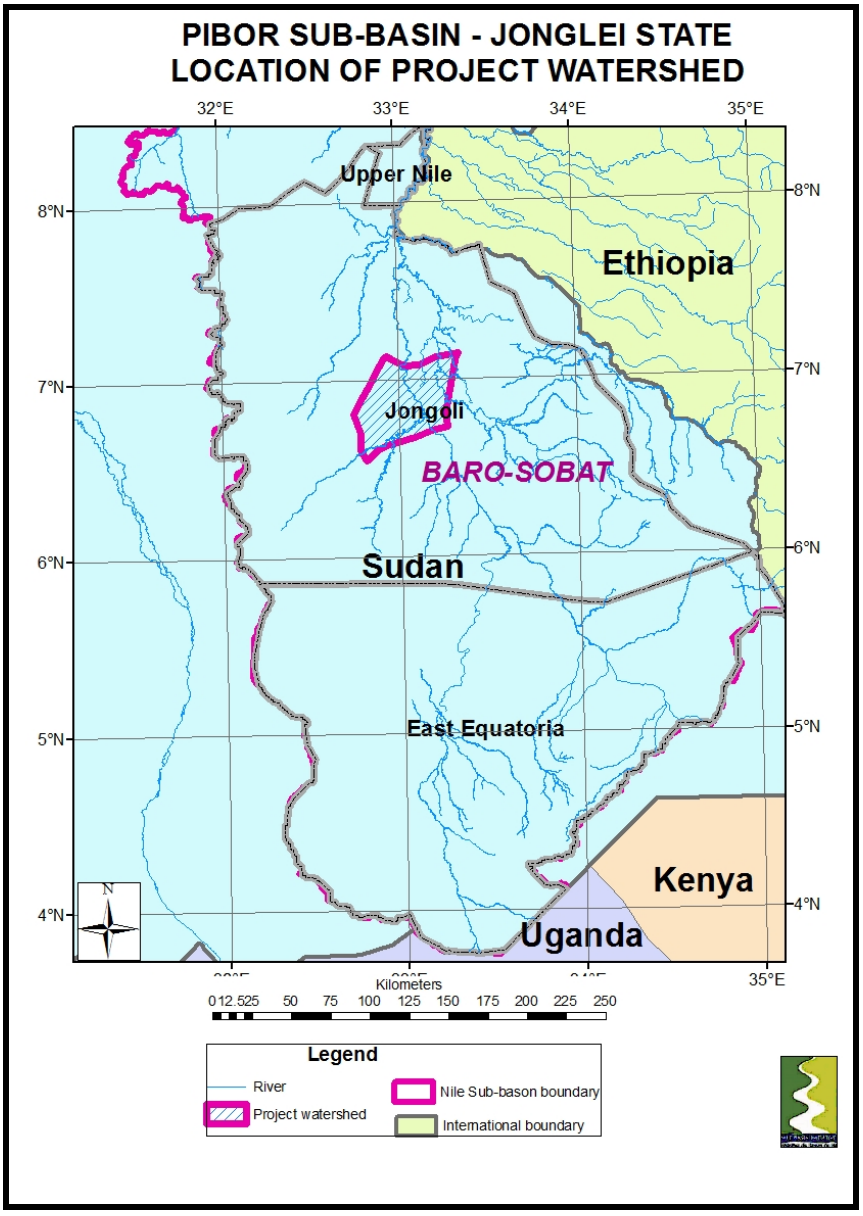
Objectives

The objects of the project are to provide support arresting rangeland degradation in the Butana Plains that encompass parts of the Atbara and Blue Sub-basins, increasing livestock feed supply and improving animal health. These interventions will support sustainable livelihoods and contribute to poverty alleviation.

PROFILE 7. Improving Rangeland and Livestock productivity in the Flood Retreat Grasslands of the Pibor-Sobat-White Nile Sub-basin, Sudan.

Location

The Project Area is located in the upper reaches of the Pibor River in the Pibor Payam in Pibor County of Jonglei State. It encompasses the whole of Pibor Payam and is some 1,482 km2 in extent.



Reason for Selection

Most grassland in the Pibor catchments are rain flooded and thus only have a seasonal pattern of use. They are of high quality early in the rains but later dry out and become unpalatable. A second opportunity for grazing these pastures comes at the beginning of the dry season when burning can initiate a flush of new growth on the residual moisture. At both time drinking water may be the main factor that limits exploitation of these pastures. The plains are drained by a network of very shallow water courses running northwards.

Other constraints to increasing livestock production and marketing are the lack of recognized and serviced stock routes with watering points and the lack of holding grounds or quarantine arrangements with Uganda, Kenya and the Democratic republic of Congo. To the north markets in the Middle East are now well established

and offer considerable opportunities for increasing livestock trade throughout the Sub-basin.

Information Present

Information on the Baro-Akobo-Sobat Basin is available in the WSM CRA Country Report on Sudan (Sobat-White Nile Sub-basin), the Trans-boundary Report on the Baro-Akobo-Sobat Sub-basin, the Distribution Analysis Report (chapter on the Baro-Akobo-Sobat Sub-Basin.

Additional Information

Up-to-date information on the area is sparse. Some detailed work was undertaken in the early 1980's as part of the studies for the Jonglei canal. Although most of the work was carried to the west of the Pibor Catchment it has relevance to the Pibor Catchment given the very similar environmental conditions. The results of these have been comprehensively reviewed in the book "The Jonglei Canal: Impact and Opportunity" edited by Howell et al (1988).

The most recent and comprehensive description of the project area is contained in the Southern Sudan Livelihoods profiles document issued by the Southern Sudan centre for Census, Statistics and Evaluation (SSCCSE) in 2006. The project area lies within the Eastern Floodplains Zone. SSCCSE has also produced a data base for Pibor County (SSCCSE/OCHA, 2005).

Other Programmes

No information is available.

Lessons Learnt

Some initial work was undertaken on the use of small bunds in shallow wadis to prolong pasture growth by FAO in Kongor district but not long enough to produce meaningful results (Howell et al. 1988).

Project Stakeholders

The Primary Project Stakeholders include the following:

- Pastoral and agro-pastoral households located with Pibor Payam;
- Staff of the State Ministry of Agriculture and Ministry of Livestock production who will receive technical and logistical support.

The Secondary Project Stakeholders include:

- Pastoral and agro-pastoral households in the surrounding payams who will benefit from reduced conflict over grazing resources because Group grazing areas have been clearly defined in the participatory Community and Strategic level land Use Planning.

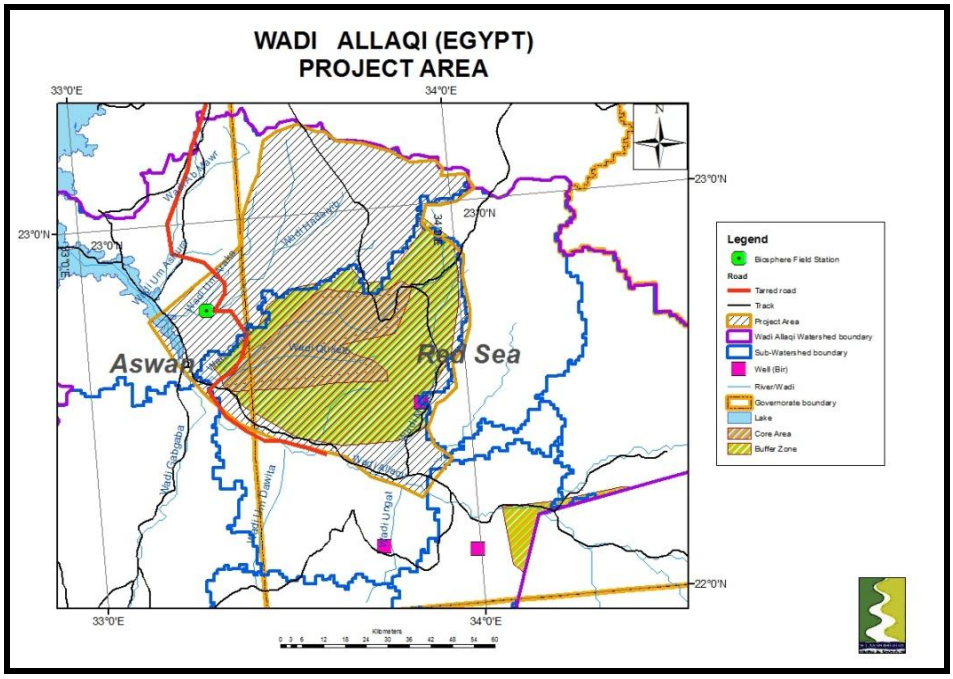
Objectives

The objects of the project are to support increase livestock feed supply, improve animal health and facilitate livestock marketing. These interventions will support sustainable livelihoods and contribute to poverty alleviation.

PROFILE 8. Livelihoods Support to the Ababda and Bishari Communities in the Wadi Allaqi, Egypt.

Location

The Project Area has been delineated so as to include the western Quleib Core Area and Buffer Zone as well as the Sub-watershed of the Wadi Hadaiyib. This encompasses the main biodiversity areas, the main permanent settlement areas of the Ababda and Bishari communities. It is also the area subject to annual inundations of Lake Nasser.



Reason for Selection

Prior to the formation of Lake Nasser the Wadi Allaqi was dry, on the surface, for all of its length. The main impact of the creation of Lake Nasser has been the creation of an arm of Lake Nasser extending some 80 to 100 kms into the lower part of the wadi. This has created a new resource opportunity – water – for the Bedouin inhabitants of the wadi. In addition to water, there are now grazing resources around the lake shore. Water can be used to irrigate small farms.

However, the wadi has other resources attractive to a number of outsiders. In the 1970's commercially exploitable deposits of talc, granite and marble were discovered. Along the lake shore large-scale agriculture is seen as an attractive investment. The lake waters of the wadi created rich fishing ground attracting fishermen into the inundated wadi. All of these put pressure on the very fragile hyper-arid ecosystems of the wadi.

In 1993 the wadi was declared a Biosphere Reserve with the UNESCO Man and the Biosphere (MAB) Programme, although it had received formal protected status in 1989. The objective of the Biosphere Reserve is to not only protect biodiversity but to protect the local livelihood systems.

Information Present

Information on the Wadi Allaqi is available in the WSM CRA Country Report on Egypt (Main Nile Sub-basin), the Trans-boundary Report on the Main Nile

Sub-basin and the Distribution Analysis Report (chapter on the Main Nile Sub-Basin.

Additional Information

From 1987 the Unit of Environmental Studies and Development (UESD) of the South Valley University in Aswan, together with the Universities of Glasgow in the U.K. have undertaken detailed ecological, economic and social studies in the wadi. Some 38 working papers have been produced together with numerous peer-reviewed journal articles. These have been brought together in book form: “Bedouins by the Lake”, Ahmed Belal, Briggs, Sharp and Springuel (2009).

Other Programmes

There is a need to obtain information on current development programmes within the wadi. It is known that the High Dam Lake Development Authority, the World Food Programme and the Aswan Governorate support development activities in and around the Lake.

Lessons Learnt

The research undertaken under the auspices of the UESD have resulted in a fund of valuable information that can be used in supporting the existing sustainable development of the Bedouin livelihoods as well as creating new livelihood opportunities. These include:

- Sustainable harvesting rates of wood for charcoal production,
- Sustainable harvesting rates of plants for medicinal and nutrition purposes,
- Identification of the most suitable soils for irrigated cultivation,
- Small-scale irrigation techniques,
- Effective cultivation techniques of indigenous plants to support habitat restoration,
- Identification of forage and vegetable varieties suitable for environmental conditions in the wadi.

Key Issues

There are tensions between the need to protect the environmental of the MAB Reserve, to develop mining, commercial agriculture and fishing resources and at the same time support the continuation of the Bedouin livelihoods. There is a need to reconcile the external concepts of spatial boundaries demarcating areas to produce “buffer” and “core” zones with the more holistic and fluid

concepts Bedouin. The Bedouin see “conservation” in terms of community needs, differing drought pressures on different vegetation resources: both on annual and much longer time-scales.

A potentially interesting and financially rewarding was for the Bedouin to use their unique knowledge of the wadi ecology is through Eco-tourism Springuel, 2008). However, uncontrolled off-road driving can irreparably damage the fragile ecology of the desert. Special interest eco-tourism such as bird watching and cultural contacts are examples of sustainable eco-tourism.

Increasing accessibility to Aswan through the new asphalt road has allowed the Bedouin to increase sheep production putting pressure on grazing resources. Access to the vegetable markets of Aswan has made vegetable production attractive. But vegetable production requires the use of fertilizers and pesticides with potentially damaging the environmental integrity of Lake Nasser. Increased access to the Aswan markets has also made the development of large-scale commercial agriculture more possible with the similar use of fertilizer and pesticides but on a much larger scale.

Egypt’s strategy for agricultural development aims at reclaiming about 3.4 million feddans by the year 2017. The Master Land Use Plan of Egypt indicates that there are about 2.88 million feddan reclaimable by the Nile water and 0.55 million feddan reclaimable by ground water. The main reclaimable areas of and around Lake Nasser are located in the East bank of the Lake in Wadi El-Allaqi and Wadi El-Targi. Those in the west bank are found in Wadi Kurker, Kalabsha, Dekka, Marwa, Tushka, Abu Simbal, Khor Sara, Tomas and Affia (Desert Research Center, 2005).

As part of the national strategy to combat poverty, the Government of Egypt plans to settle approximately one million people on reclaimed desert in the area around Lake Nasser by the year 2017. In other areas of desert development in Egypt new settlers have been highly vulnerable to hardship in the early stages and that the impact of new settlements on the environment can be adverse (Centre for Development Services/Dessert Development Centre, 2004).

Project Stakeholders

The Primary Project Stakeholders include:

- The Ababda and Bishari households who live within the Project Area;

- Staff of the Aswan High dam Authority and the Aswan Regional Planning Authority who will receive technical and logistical support.

Secondary Project Stakeholders will include the Eco Tourists who visit the Project Area to enjoy and appreciate the livelihood systems and culture of the Ababda and Bishari people and also the unique desert ecosystem in a pristine condition.

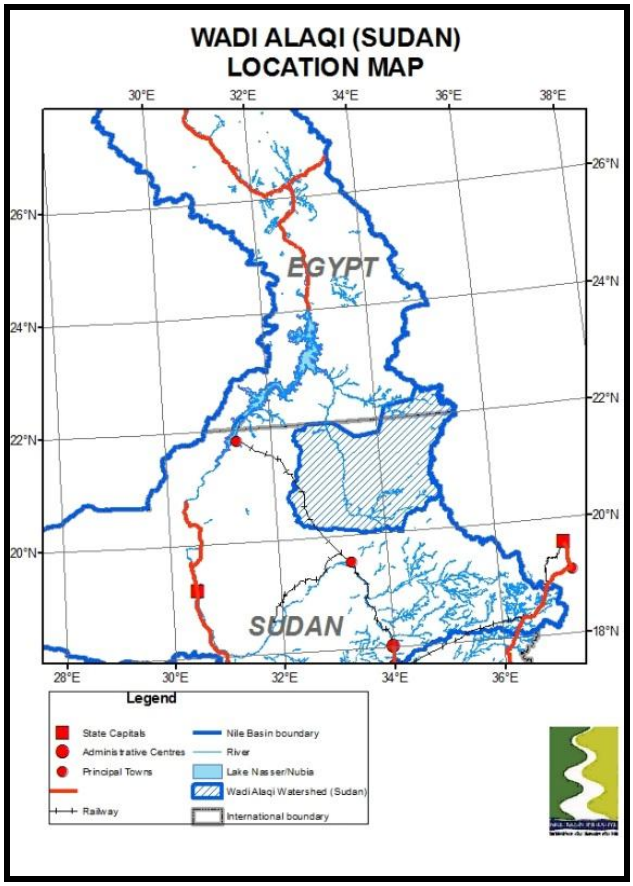
Objectives

The Wadi Allaqui is a UNESCO Man and the Biosphere Reserve and is the home to two Bedouin tribes the Ababda and the Bishari whose livelihoods are extremely precarious. The Project will support to their current livelihood strategies and opportunities to create new strategies. These interventions will reduce their vulnerability to natural shocks and contribute to poverty alleviation.

PROFILE 9. Support to Baseline Surveys and Consultation for Application to UNESCO for recognition of the Wadis Allaqi-Gabgaba in Sudan as a Biosphere Reserve.

Location

The Wadis are located in northeastern Sudan. Within Sudan the total Watershed covers some 60,096 km2: that of theWadi Allaqi is14,727 km2 (25 percent) and that of the Wadi Gabgaba some 45,369 km2.(75 percent).



Reason for Selection

In 1993 the Wadi Allaqi within Egypt was declared a Biosphere Reserve with the UNESCO Man and the Biosphere (MAB) Programme, although it had received formal protected status in 1989. The objective of the Biosphere Reserve is to not only protect biodiversity but to protect the local livelihood systems. However, a considerable part of the total watershed within Sudan was not included notwithstanding that the whole Watershed is an integral ecological and livelihoods unit.

A Trans-boundary Biosphere Reserve incorporating the entire watershed makes environmental and livelihoods sense. The Egyptian part of the Watershed has been subject to intensive research over 20 years, whilst that part within Sudan has been relatively neglected. If the Sudan part of the watershed is to be designated as a Biosphere Reserve there is an urgent need to obtain basic environmental and livelihoods information.

Information Present

Information on the bio-physical aspects (climate, soils, land use) is available in the WSM CRA Country Report on Egypt (Main Nile Sub-basin), the Trans-boundary Report on the Main Nile Sub-basin and the Distribution Analysis

Report (chapter on the Main Nile Sub-Basin. However, there is very little information on the population and their livelihood systems.

Lessons Learnt

The research undertaken under the auspices of the UESD provide a model for the type of participatory and adaptive research required for the Sudan side of the Watershed.

Key Issues

There are tensions between the need to protect the environmental, to develop mining, and at the same time support the continuation of the livelihoods. There is a need to reconcile the external concepts of spatial boundaries demarcating areas to produce “buffer” and “core” zones with the more holistic and fluid concepts of the Bishari. The Bishari see “conservation” in terms of community needs, differing drought pressures on different vegetation resources: both on annual and much longer time-scales.

A potentially interesting and financially rewarding livelihood strategy is for the Bishari to use their unique knowledge of the wadi ecology is through Eco-tourism Springuel, 2008). However, uncontrolled off-road driving can irreparably damage the fragile ecology of the desert. Special interest eco-tourism such as bird watching and cultural contacts are examples of sustainable eco-tourism.

Project Stakeholders

The Primary Project Stakeholders include:

- The Bishari households who live within the Project Area;
- Staff of the Sudan Wildlife Conservation General Administration who will receive technical and logistical support;
- Sudanese Researchers who will undertake medium term research into the Bishari Livelihood systems and into the desert ecosystems.

Secondary Project Stakeholders will include the Eco Tourists who visit the Project Area to enjoy and appreciate the livelihood systems and culture of the Bishari people, the unique desert ecosystem in a pristine condition and the archeological and cultural heritage.

Objectives

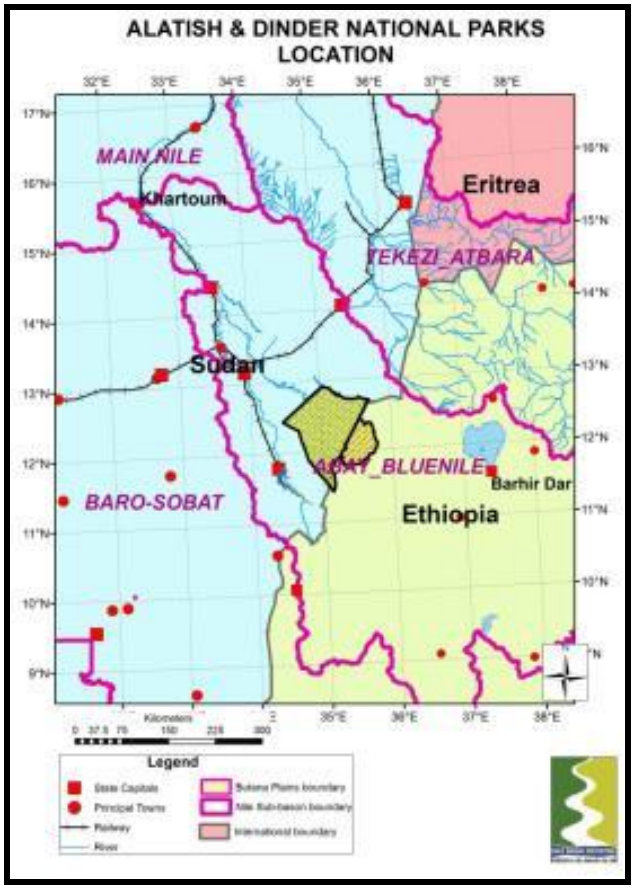
There has been a wealth of ecological, sociological and economic studies undertaken over two decades in the current Biosphere Reserve within Egypt. The objective of this Project is to provide support to the Sudan Wildlife Conservation General Administration (WCGA) to obtain baseline information to enable the Governments of Egypt and Sudan to establish a Trans-boundary Wadi Allaqi UNESCO Man and the Biosphere Reserve. This would require undertaking botanical, ecological and livelihoods surveys in the Sudan part of the Reserve.

The Project would provide human capacity building support to enable close collaboration between Egypt and the Sudan both at the local and the national levels. This would involve provision of logistical support to undertake the necessary surveys. The project provides support to enable knowledge exchange through workshops and meetings.

PROFILE 10. Establishment of Trans-boundary Dinder-Rahad Park and Livelihoods Support.

Location

The Dinder National Park is located along the Ethiopian-Sudan border between the Blue Nile and Atbara Rivers. The Alatish National Park is located almost opposite to the Dinder Park within Ethiopia, although it is slightly smaller in size and does match with the Dinder Park along the whole of its length.



Reason for Selection

There is considerable scope to develop an international trans-boundary park by combining the Dinder and the Alatish National Parks. Both Parks are located alongside each other, either side of the border between Ethiopia and Sudan. The Dinder Park is well established, gazetted and internationally recognized. In contrast, the Alatish Park currently has only recently been established. The Federal Ethiopian Wildlife Development and Conservation Department (EWDCD) have recommended that it be nationally gazetted and also made the recommendation for the establishment of a Trans--boundary Park.

There is now considerable experience in Sudan of a community-based approach to Park management in the Dinder National Park. Both Parks experience seasonal grazing from Felata pastoralists and are subject to pressures from people living around the Park.

Information Present

Information on the Dinder and Alatish National Parks is available in the WSM CRA Country Reports on Ethiopia and Sudan (Abbay and Blue Nile Sub-basins), the Trans-boundary Report on the Abbay-Blue Nile Sub-basin and the Distribution Analysis Report (chapter on the Abbay-Blue Nile Sub-Basin.

Additional Information

For the Alatish National Park there is the initial assessment made by the EWDCD Cherie Enawgaw et al (2006) although there may be more recent un-published reports since the takeover of the park from the Regional authorities by the Federal government. For the Dinder Park a Management Plan has been produced and is available (HCENR/WCGA, 2004). More recently it has been announced that the Management Plan has been up-dated and is now valid for the years 2011 to 2015 (GoS, 2010).

NTEAP supported the preparation of a Dinder-Alatish Trans--boundary Protected Area Management Plan (2009). This provides an outline of the key trans-boundary management issues and makes a number of recommendations for their resolution. This document provides a starting point for the current Project.

There have been a large number of specific studies on ecological, hydrological and socio-economic aspects of the Dinder Park by the Sudan Wildlife Research centre, and the Universities of Geizera and Khartoum.

The Dinder Park is also a UNESCO MAB Reserve and a RAMSAR Designated International Wetland sites, and there reports available from both UNESCO and RAMSAR. Bird Life International has published a report on the status of birds in the Dinder Park.

IUCN have undertaken a survey of the Tora Hartebeest on the Ethiopian side of the border (Heckle et al. 2007) and the EWDCD commissioned an environmental economic valuation of all the National Parks in Ethiopia including the Alatish Park (Obe, 2009).

Lessons Learnt

The Dinder National Park, which was proclaimed in 1935, is located within three States: Sennar, Blue Nile and Gedarif. It boundaries follow to the north of the Rahad in the north, to the south of the Dinder in the south and the Ethiopian border to the east, and covers an area of 8,960 km^2. It is also a designated Biosphere Reserve and has been designated under the Ramsar Convention as an international Wetland.

There is now considerable experience in Sudan of a community-based approach to Park management in the Dinder National Park. Both Parks experience seasonal grazing from Felata pastoralists and are subject to pressures from people living around the Park.

Other Programmes

The main programme supporting the Dinder N.P is the ENTRO Fast Track Watershed Management Project to the Dinder NP.

In addition there is the GEF/UNDP Dinder National Park Project. In Ethiopia support has been confined to small projects funded under the NBI small projects programme.

Project Stakeholders

The Primary Stakeholders of this Project are field and Headquarters staff of:

(i) the Ethiopian Wildlife Conservation Organisation

(ii) the Sudan Wildlife Conservation General Administration

They require support to enable more frequent and effective networking between the two organisations.

Secondary Stakeholders include:

- Rural communities living in and on the periphery of the two parks who will become key partners in the effective management of the two parks;
- Visitors to the two parks who will experience increased wild flora and fauna that will results from more effective park management;

Objectives

The objective of the project is to provide support to the Governments of Ethiopia and Sudan in establishing a Trans--boundary Park comprising the Dinder National Park in Sudan and the Alatish National Park in Ethiopia.

5. RANKING AND PRIORITISING PROPOSED PROJECTS

5.1 Purpose of Ranking and Prioritising

The Projects have already been screened and thus no one project is superior to any other. Thus, the purpose of prioritizing the projects is:

- To enable ENTRO to manage to the next stage of project design and preparation in a phased manner;
- This is because the Watershed Management Project funding sequencing necessitates this to be implemented over a three year period;
- Possible that one or more donors may request ENTRO to provide details of potential projects that accord with their own specific set of selection criteria;
- To facilitate this process Projects have also been grouped into a number of broad thematic areas.

5.2 List of Criteria

5.2.1 Provisional List of Criteria for Project Selection

A provisional list of criteria was developed during the Inception Phase. Areas of severe resource degradation or "hot spots" had been identified in the Trans--boundary Analysis Watershed Management CRA and had been taken into consideration in the Project selection. This provisional list of criteria provided initial guidance on the type and level of information to be collected for the purpose of micro-catchment delineation.

Empirical work in Sudan and in Ethiopia indicated generally high levels of poverty in all rural areas and most particularly amongst pastoralists, agro-pastoralists and rainfed agriculturalists. For this reason no specific group or geographic area was used as criteria, rather the level and degree of impact the proposed intervention had on the levels of household production, income and vulnerability was used.

The expectation of regional benefits such as the alleviation of downstream environmental, economic and/or social damages, were also seen as very important. Cooperative action in terms of watershed management is likely to be more forthcoming where benefits accrue to two or more riparians.

Where a Project accrued potential global benefits this was also seen as very important, particularly in terms of seeking and obtaining financing from one of the global financing mechanisms: e.g. the Global Environment Fund (GEF), Carbon Fund, etc.

Taking these as a starting point a provisional list of screening criteria for the nine projects under examination was developed.

1. **Local benefits** will exceed costs and contribute to:
   - Increased household income and thus poverty reduction;
   - Increased equitable access to resources by all members of the community;
   - reduced vulnerability of local households to environmental, social and economic “shocks”;
   - enhanced integrity of natural resources and the environment that will support sustainable livelihoods of local inhabitants;
   - the increased value of natural resources to local communities leading to an increased willingness to protect the sustainable supply of services and products from these resources.

2. **Down-stream Regional benefits** will exceed costs and contribute to:
   - Reduction in environmental costs for down-stream users;
   - reduced vulnerability of downstream households to environmental, social and economic “shocks” that were previously caused by upstream environmental degradation.

3. **Global benefits** will exceed costs and contribute to:
   - Enhanced integrity of the global environment that will contribute to sustainable livelihoods across the world.
4. **Threats to Biodiversity reduced**:

5. **Project involves close and active cooperation** of the local communities.

6. **Local communities are empowered and their natural resource management institutions** are strengthened;

7. **Local communities gain increased technical and financial capacity** to sustainably increase production, product quality and thus increase incomes.

8. **Access to product and market information by local communities** is increased thereby increasing value added and market price received.

5.2 Extended List of Criteria for Ranking and Prioritizing Proposed Projects

In developing an extended list of criteria for prioritizing the proposed projects reference has been made to the criteria developed for the Fast Track Projects in Ethiopia (King & Leul Kahsay Gezehegn, 2005) and Sudan (Bullock & Yagoub Abu Shora, 2005).

Given that the present study is one step in the Project cycle the Project Logical Framework (LF) has been used as the basic structure for ranking and prioritizing criteria. The levels of the LF are as follows:

- Project Goal (Strategy)/Project Objective
- Project deliverables: (Outcomes)
- Project Activities (Outputs)

In addition, the Project Assumptions/Risks that constitute the fourth column of Logical Framework are included.

The extended list of criteria incorporates (i) those from the initial list outlined in para.5.1 above, (ii) criteria proposed by various stakeholders during the field visits.

The proposed structure of the criteria is as follows:

1. Relevant to Local, Regional /State, National and NBI-ENSAP policies and strategies.(Goal/Objectives)
2. Problems related to identified environmental and natural resource hotspots addressed (Outcomes).
3. Local, Downstream and Global Benefits Accrue. (Outputs)
4. Risks to project outcomes and outputs can be mitigated.

The detailed criteria are listed below within the proposed structure outlined above.

1. ***Relevant to Regional/State, National and NBI-ENSAP policies and strategies.***
   - Relevant to policies/strategies of Region/State.
   - Relevant to National Policies and Strategies.
   - Relevant policies/strategies of NBI-ENSAP.
   - Relates to other interventions/projects/programmes. (e.g. other ENSAP and JMP Projects).
2. ***Problems related to identified environmental and natural resource hotspots addressed***

- Key stakeholders are correctly identified.
- Project correctly addresses Community needs underlying problems.
- New natural resources assets are created that contribute to more than one identified need (e.g. social needs/production needs).
- Project contributes to improved environment and/or reduced environmental degradation that will support sustainable livelihoods of local inhabitants;
- Threats to biodiversity (genetic, species and habitat) are reduced.

3. Local, Downstream and Global Benefits Accrue

3.1 Local benefits will exceed costs and contribute to:

- Increased household income and poverty reduced;
- Equitable access to resources by all members of the community increased;
- Vulnerability of local households to environmental, social and economic "shocks" reduced;
- Value of natural resources to local communities increased leading to an increased willingness to protect the sustainable supply of services and products from these resources

3.2 Down-stream Regional benefits will exceed costs and contribute to:

- Environmental costs for down-stream users reduced;
- Vulnerability of downstream households to environmental, social and economic "shocks" that were previously caused by upstream environmental degradation reduced;
- Regional/trans-boundary cooperation enhanced.

3.3 Global benefits will exceed costs and contribute to:

- Integrity of the global environment enhanced contributing to sustainable livelihoods across the world.

4. Risks to project outcomes and outputs can be mitigated.

5.3 Screening Methodology

5.3.1 Process

The process was as follows:

- A comparative assessment was undertaken of each project for each Sub Criterion and given a score from 1 to 5.

- The Sub criterion in each of the four Main Criteria were given a weighting factor (%) such that the Sub Criteria weighting factors for each Main Criteria added up to 100%.

- The individual scores (1 to 5) for each Sub-criterion was multiplied by the individual sub criteria weighting factor (%.)

- The weighted scores of each Sub Criteria were added up to obtain aggregate Main Criteria score for each Project.

- Each Main Criteria was assigned a weighting factor (%) such that the four weighting factors added upto 100%
- The aggregate Main Criteria scores were multiplied by Main Criteria Weighting Factors to obtain a Weighted Score for each Main Criteria for each Project.
- The four weighted scores of the Main Criteria added up to obtain the **FINAL OVERALL WEIGHTED SCORE** for each Project.

5.3.2 Comparative Assessment of Projects by individual criteria

For each individual sub criterion a comparative assessment of each project was undertaken using information from documents, lessons learned during field visits and other information variously conveyed to the mission.

For each Project, every Sub Criteria was scored on the basis of a range from 1 to 5. This was achieved by first identifying the norm (score of 3) amongst the ten projects. Other Projects were then compared against the norm, ranking either higher or lower on the balance of evidence available (ANNEX 3).

5.3.3 Sub Criteria Assigned Weighting Factor

Each of the four Main criteria was enumerated separately. Individual Subsidiary criteria were assigned a weighting factor. Weighting factors of Sub Criteria for each of the Main criteria sum to 100 percent (Table 1).

Within Main Criteria 1 all weights are the same. Within Main Criteria 2 Sub-criteria 2.2 (Project correctly addresses Community priorities and underlying problems) and 2.5 (Project contributes to improved environment and/or reduced environmental degradation that will support sustainable livelihoods of local inhabitants) receive the highest weights, as it is considered that these are more important than the other criteria. In Main Criteria 3 with respect to 3.1 Local Benefits Sub Criteria 3.1.1 (Household Income Increased and poverty reduced) receives the highest weighting reflecting its considered importance over the other sub criteria. In Main Criteria 3.2 with respect to Downstream/Regional benefits Sub Criteria 3.2.1 (Environmental costs for down-stream users reduced) receives the highest weighting reflecting its considered importance over the other sub criteria.

Table 1. Sub Criteria Weighting Factors (%)

CRITERIA	WT
1. Accords with Regional/State, National and NBI-ENSAP policies and strategies.	
Relevant to policies/strategies of Region/State.	35%
Relevant to National Policies and Strategies.	35%
Relevant policies/strategies of NBI-ENSAP.	15%
Relates to other interventions/ projects/ programmes.(e.g. other ESNSAP and JMP Projects).	15%
TOTAL	**100%**
2. Problems related to identified environmental and natural resource hotspots are addressed (Objective).	
Key stakeholders are correctly identified.	15%
Project correctly addresses Community needs & underlying problems.	25%
New natural resources assets are created that contribute to more than one identified need (e.g. social needs/production needs).	20%
Project contributes to improved environment and/or reduced environmental degradation that will support sustainable livelihoods of local inhabitants;	25%
Threats to biodiversity (genetic, species and habitat) are reduced.	15%
TOTAL	100%
3. Accrues Local, Downstream and Global Benefits.	
3.1 Local benefits will exceed costs and contribute to:	
Household income increased and poverty reduced;	20%
Equitable access to resources by all members of the community increased;	12%
Vulnerability of local households to environmental, social and economic "shocks" reduced;	14%
Value of natural resources to local communities increased leading to an increased willingness to protect the sustainable supply of services and products from these resources.	12%
3.2 Down-stream Regional benefits will exceed costs and contribute to:	
Environmental costs for down-stream users reduced;	12%
Vulnerability of downstream households to environmental, social and economic "shocks" that were previously caused by upstream environmental degradation reduced;	10%
Regional/ trans-boundary cooperation enhanced	10%
3.3 Global benefits will exceed costs and contribute to:	
Integrity of the global environment enhanced contributing to sustainable livelihoods across the world.	10%
TOTAL	**100%**
4. Risks to project outcomes and outputs can be mitigated.	
TOTAL	**100%**

5.3.4 Applying Weighting Factors to the Four Main Criteria

The next step was to weight the four main criteria as in Table 2.

Table 2. Weighting Factors for main Criteria

MAIN CRITERIA	WT %
1. Accords with Regional/State, National and NBI-ENSAP policies and strategies.	20%
2. Problems related to identified environmental and natural resource hotspots addressed (Objective).	40%
3. Local, Downstream and Global Benefits accrue.	30%
4. Risks to project outcomes and outputs can be mitigated.	10%

Main Criteria 2 was considered the most important of the four and thus was accorded the highest weight. This was followed in tern by Main Criteria 3, then 1 and finally 4.

5.4 Results of Ranking and Prioritisation

The unweighted scores were assigned to each Sub Criteria for each Project (Table 3).

Each unweighted score was then multiplied by the relevant Sub Criteria weighting. The relevant resulting Weighted Scores of each Sub Criteria are shown below in Table 4. These were then aggregated by each of the four Main Criteria.

A summary of the Main Criteria Aggregate Scores from table 4 are shown in table 5.

Table 3. Unweighted Scoring Matrix for Sub Criteria

	1, Zamra	2. Bibbir	3. Sor	4. Telkuk	5. Atbara	6. Butana	7. Pibor	(Eg)	(Sud)	Alatish-
1. Accords with Regional/State, National and NBI-ENSAP policies and strategies.										
Relevant to policies/strategies of Region/State.	3	3	3	3	3	3	3	3	3	3
Relevant to National Policies and Strategies.	3	3	3	3	3	3	3	3	3	3
Relevant policies/strategies of NBI-ENSAP.	3	3	3	3	3	3	3	3	3	3
Potential linkages to other interventions/ projects/	3	3	3	3	3	3	3	3	3	3
TOTAL	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**
2. Problems related to identified environmental and natural resource hotspots are addressed (Objective).										
Key stakeholders are correctly identified.	3	3	3	3	3	3	3	4	2	3
Project correctly addresses Community needs & underlying	4	3	3	4	3	4	4	3	3	3
New natural resources assets are created that contribute to	3	3	3	3	4	3	4	3	3	3
Project contributes to improved environment and/or reduced	3	3	3	3	4	3	3	3	2	3
Threats to biodiversity (genetic, species and habitat) are	3	3	3	3	3	3	3	5	4	5
TOTAL	**16**	**15**	**15**	**16**	**17**	**16**	**17**	**18**	**14**	**17**
3. Accrues Local, Downstream and Global Benefits.										
3.1 Local benefits will exceed costs and contribute to:										
Household income increased and poverty reduced;	4	3	3	4	3	3	4	3	2	2
Equitable access to resources by all members of the	3	3	3	3	3	3	3	3	3	3
Vulnerability of local households to environmental, social and	4	3	3	4	3	4	4	3	3	2
Value of natural resources to local communities increased	3	3	4	3	3	3	3	4	4	2
3.2 Down-stream Regional benefits will exceed costs and contribute to:										
Environmental costs for down-stream users reduced;	4	4	4	3	4	3	4	3	3	3
Vulnerability of downstream households to environmental,	4	4	4	3	4	3	4	3	3	3
Regional/ trans-boundary cooperation enhanced	3	3	3	3	3	3	3	3	5	5
3.3 Global benefits will exceed costs and contribute to:										
Integrity of the global environment enhanced contributing to	3	3	3	3	3	3	3	3	3	3
TOTAL	**27**	**26**	**26**	**26**	**26**	**24**	**27**	**24**	**25**	**23**
4. Risks to project outcomes and outputs can be mitigated.										
	3	3	3	3	3	3	3	3	3	3

Table 4. Weighted Sub Criteria Scores

	WT	1, Zamra	2. Bibbir	3. Sor	4. Telkuk	5. Atbara	6. Butana	7. Pibor	8. Allaqi (Eg)	9. Allaqi (Sud)	10. Alatish-Dinder
1. Accords with Regional/State, National and NBI-ENSAP policies and strategies.											
Relevant to policies/strategies of Region/State.	35%	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
Relevant to National Policies and Strategies.	35%	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
Relevant policies/strategies of NBI-ENSAP.	15%	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
Relates to other interventions/ projects/ programmes.(e.g.	15%	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
TOTAL	**100%**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**
2. Problems related to identified environmental and natural resource hotspots are addressed (Objective).											
Key stakeholders are correctly identified.	15%	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.60	0.30	0.45
Project correctly addresses Community needs &	25%	1.00	0.75	0.75	1.00	0.75	1.00	1.00	0.75	0.75	0.75
New natural resources assets are created that contribute to	20%	0.60	0.60	0.60	0.60	0.80	0.60	0.80	0.60	0.60	0.60
Project contributes to improved environment and/or	25%	0.75	0.75	0.75	0.75	1.00	0.75	0.75	0.75	0.50	0.75
Threats to biodiversity (genetic, species and habitat) are	15%	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.75	0.60	0.75
TOTAL	100%	**3.25**	**3.00**	**3.00**	**3.25**	**3.45**	**3.25**	**3.45**	**3.45**	**2.75**	**3.30**
3. Accrues Local, Downstream and Global Benefits.											
3.1 Local benefits will exceed costs and contribute to:											
Household income increased and poverty reduced;	0.20	0.80	0.60	0.60	0.80	0.60	0.60	0.80	0.60	0.40	0.40
Equitable access to resources by all members of the community increased;	0.12	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36
Vulnerability of local households to environmental, social and economic "shocks" reduced;	0.14	0.56	0.42	0.42	0.56	0.42	0.56	0.56	0.42	0.42	0.28
Value of natural resources to local communities increased leading to an increased willingness to protect the sustainable supply of services and products from these resources.	0.12	0.36	0.36	0.48	0.36	0.36	0.36	0.36	0.48	0.48	0.24
3.2 Down-stream Regional benefits will exceed costs and contribute to:											
Environmental costs for down-stream users reduced;	12%	0.48	0.48	0.48	0.36	0.48	0.36	0.48	0.36	0.36	0.36
Vulnerability of downstream households to environmental, social and economic "shocks" that were previously caused by upstream environmental degradation reduced;	10%	0.40	0.40	0.40	0.30	0.40	0.30	0.40	0.30	0.30	0.30
Regional/ trans-boundary cooperation enhanced	10%	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.50	0.50
3.3 Global benefits will exceed costs and contribute to:											
Integrity of the global environment enhanced contributing to sustainable livelihoods across the world.	10%	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
TOTAL	**100%**	**3.56**	**3.22**	**3.34**	**3.34**	**3.22**	**3.14**	**3.56**	**3.12**	**3.12**	**2.74**
4. Risks to project outcomes and outputs can be mitigated.											
TOTAL	100%	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**

.Table 5. Aggregate Scores of Main Criteria from Table 3.

MAIN CRITERIA	1, Zamra	2. Bibbir	3. Sor	4. Telkuk	5. Atbara	6. Butana	7. Pibor	8. Allaqi (Eg)	9. Allaqi (Sud)	10. Alatish-Dinder
1. Accords with Regional/State, National and NBI-ENSAP policies and strategies.	3	3	3	3	3	3	3	3	3	3
2. Problems related to identified environmental and natural resource hotspots addressed (Objective).	3.25	3	3	3.25	3.45	3.25	3.45	3.45	2.75	3.3
3. Local, Downstream and Global Benefits accrue.	3.56	3.22	3.34	3.34	3.22	3.14	3.56	3.12	3.12	2.74
4. Risks to project outcomes and outputs can be mitigated.	3	3	3	3	3	3	3	3	3	3
TOTAL	**13.06**	**12.71**	**12.58**	**12.81**	**12.91**	**12.61**	**13.26**	**12.9**	**11.96**	**12.29**

The aggregate Main Criteria scores in table 5 were then multiplied using the Main Criteria weights (Table 2) above. The results are shown in table 6 below.

Table 6. Final Weighted Scores by Main Criteria and order of Project Priority

MAIN CRITERIA	WT	1, Zamra	2. Bibbir	3. Sor	4. Telkuk	5. Atbara	6. Butana	7. Pibor	8. Allaqi (Eg)	9. Allaqi (Sud)	10. Alatish Dinder
1. Accords with Regional/State, National and NBI-ENSAP policies and strategies.	20%	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
2. Problems related to identified environmental and natural resource hotspots addressed (Objective).	40%	1.3	1.2	1.2	1.3	1.38	1.3	1.38	1.38	1.1	1.32
3. Local, Downstream and Global Benefits accrue.	30%	1.068	0.966	1.002	1.002	0.966	0.942	1.068	0.936	0.936	0.822
4. Risks to project outcomes and outputs can be mitigated.	10%	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
TOTAL		3.268	3.066	3.102	3.202	3.246	3.142	3.348	3.216	2.936	3.042
PRIORITY		2	8	7	5	3	6	1	4	10	9

It is possible that some donors may wish to use their own criteria for selecting projects for funding. These criteria might include a specific country or countries; a specific thematic area such as Integrated Watershed Management, Biodiversity Conservation or Livestock Production and Rangeland Improvement.

The grouping of Projects below serves to meet this requirement. Within each Grouping the order of priority derived from Table 6 is used and shown in table 7.

Table 7. Grouping of Projects according to thematic area

GROUP	PROJECTS
1. COUNTRY	
Egypt	1. Wadi Allaqi Livelihoods Project
Ethiopia	1. Zamra WSM Project 2. Sor WSM Project 3. Upper Birbir WSM Project
Sudan (N)	1.Atbara Kerib Restoration Project 2.Telkuk Water Harvesting Project 3. Butana (Gedaref) Project 4. Wadi Allaqi/Gabgaba Project
Sudan (S)	1. Piibor Rangelands Project
Trans-boundary:Ethiopia/Sudan	1.. Alatish-Dinder Trans-boundary Park.
2. BIO-DIVERSITY EMPHASIS	1. Wadi Allaqi Livelihoods Project
	2. Wadi Allaqi/Gabgaba Project
	10. Alatish-Dinder Trans-boundary Park.
3. WATERSHED MANAGEMENT/SUSTAINABLE LAND MANAGEMENT	1. Pibor Rangelands Project 2. Zamra WSM Project
	3. Atbara Kerib Restoration Project 4. Telkuk Water Harvesting Project 5. Butana Plains (Gedaref) Project
4. PAST/PRESENT DEVELOPMENT NEGLECT (LACK OF ACCESS/ INSECURITY)	1. Pibor Rangelands Project 2.Telkuk Water harvesting Project 3. Upper Birbir WSM Project 4. Wadi Allaqi/Gabgaba Project
5. RANGELAND/LIVESTOCK EMPHASIS	1. Pibor Rangelands Project 2. Telkuk Water harvesting Project 3. Butana Plains (Gedaref) Project

ANNEX 1. TERMS OF REFERENCE

1. Background:

The EN countries, comprising of Egypt, Ethiopia, & Sudan are pursuing cooperative development at the sub-basin level through the investment oriented Eastern Nile Subsidiary Action Program (ENSAP). Towards this end, the EN countries have identified their first joint project, the Integrated Development of the Eastern Nile (IDEN), which consists of a series of sub-projects addressing issues related to flood preparedness and early warning, power development and interconnection, irrigation and drainage, watershed management, multi-purpose water resources development, and modeling in the Eastern Nile. The Eastern Nile Technical Regional Office (ENTRO) is an institution established by the three EN countries to advance the implementation of ENSAP projects.

The Eastern Nile Watershed Project is one of the seven areas of cooperation agreed by the Eastern Nile countries. Its immediate objective is to establish a sustainable framework for the management of selected watersheds in the sub-basin in order to improve the living conditions of the people, enhance agricultural productivity, protect the environment, and reduce sediment transport and siltation.

Towards meeting its objective, the Watershed project undertook two sets of activities in parallel between 2004 -2008: preparation of investment ready projects for national implementation (fast track projects) and a Regional Cooperative Assessment (CRA) study. Both sets of activities were successfully completed. Currently implementation of eight pilot projects is initiated at national level.

The Watershed Management Cooperative Regional Assessment (CRA) identified and prepared Project Profiles for a number of potential follow-up watershed management projects. It is now intended that ENTRO will prioritize and compile full report from these Profiles through this consultancy. This is envisaged to enhance the capacity of ENTRO for subsequent resource mobilization and the coordination of the eventual preparation of the prioritized projects, which will take place after this consultancy has concluded. In collaboration with the ENSAP teams, criteria for prioritizing the projects will be established. It is possible that in some cases projects may be integrated where synergy between the projects can be achieved.

2. Objectives of the assignment:

The objective of this assignment is to define watershed investment projects from the broadly identified hot spot areas by the CRA study for watershed management (List of profiles of hot spot areas is attached herewith[3]) for detailed project preparation. The assignment involves delineation of each hot spot area in to sub-watersheds of manageable size and prioritizes them based on agreed criteria.

3. Scope of the assignment

This consultancy aims at defining potential watershed projects for eventual preparation and investment through reviewing profiles of broadly identified hot spot areas, delineating each of the hot spot areas in to micro-watersheds of manageable size, and prioritizing them on the basis of criteria to be developed in consultation with national counterparts. Each delineated area will be described in terms of socioeconomic and biophysical characteristics through document review and field assessment. Collecting available background information for each of the delineated sub-watersheds, reviewing, analyzing, assessing, and documenting related programs with in the delineated sub-watersheds will be a key activity of this consultancy. The list of criteria developed and agreed will guide the collection and compilation of information (both secondary and primary data) that will later be used in the evaluation of micro-watersheds.

Stakeholders' participation and adoption of an integrated watershed management approach are the imperative approaches in this assignment. The consultant is expected to work at all levels with government and non-government experts, who are knowledgeable about the areas under consideration as well as with the community residing in these areas. In addition the consultant shall work very closely with the national coordinators for watershed and their team as well as with ENTRO in developing the list of criteria for prioritization.

At the end of the assignment the consultant will present the findings in a regional workshop for final review and approval.

1. [3] The CRA study for watershed management has prepared profiles for 13 hot spot areas. Out of these only nine are included in the list. The remaining four are within the Abbay Basin and these are excluded from the list as they are already being reviewed under the JMP 1 ID project.

4. **Specific Tasks**

The consultant shall review the information provided in the deliverables of the Cooperative Regional Assessment study which include:

- Trans-boundary analysis country reports for Egypt, Ethiopia, and Sudan
- Trans-boundary analysis for the Abay-blue Nile; Tekeze Atbara, Baro-Akobo-Sobat, and Main Nile sub-basins
- Distributive Analysis
- Watershed Management in the Eastern Nile Basin: Constraints and Challenges
- Project profiles

Making use of this information but not limited to, the consultant shall carry the following tasks:

- Review the project profiles provided (list attached) and delineate each in to micro-watersheds of manageable size (1,000 – 2000 km2)
- Develop list of criteria for ranking and prioritizing the micro-watersheds in consultation with key stakeholders.
- Through a process of stakeholders consultation (national watershed coordinators and working groups; ENTRO, the World Bank; potential donors and others as required), finalize the list of criteria for ranking.
- Collect essential information for each micro-watershed through conducting a desk study based on readily available information and collecting additional information through field visits and consultations with local population. The consultant shall base the type and level of information required on the list of criteria developed early on.
- Identify on-going investment projects with in each of the delineated sub-watersheds, including water infrastructures, of relevance in the project area
- Identify key issues, challenges and potentials for each of the delineated watersheds that will form potential project components during the detailed project preparation
- Based on the review conducted, screen & rank all the micro-watersheds based up on the agreed list of criteria.

5. Outputs

The output of the consultancy shall contain the information above, and be in the form of documents and maps. The consultant will provide the following:

- **An inception report:** within one week of commencement, the consultant will comment on the material and information on the project profiles provided by ENTRO and a work plan on how the consultants will carry out the work including logistical arrangement.
- **Draft final report**: Submit a draft final report of the consultancy which will include (i) a list of screening and ranking criteria, (ii) description of each micro-watershed (the description should as much as possible include on going investment projects as well as identification of development issues, including information emerging from each of the tasks listed in section 4, above, challenges and opportunities that will form potential project components during the detailed project preparation), (iii) screening and ranking matrix of the sub-watersheds with a clear justification of the evaluation of each sub-watershed against the criteria which is clearly referencing the information used to arrive to this assessment, and (iv) List of micro-watersheds in order of priority.
- **Workshop** is an important output of this consultancy. The consultant will present its findings to key stakeholders in a workshop.
- **Final report.** Submit a final report in which comment from workshop participants and other stakeholders is incorporated.

Additionally, a dataset should be delivered which contains all data collected during the consultancy, in a format that will be agreed with the client during contract negotiations. The format for GIS and RS data, the following file/document formats will be used:

- For georeferenced image or satellite - GeoTiff
- For raster files – ESRI grid format
- For vector data -ESRI Geodatabase or shapefile formats.
- Time series data – Excel

The outputs will be according to an agreed work plan. Consultant payment schedules will be linked to outputs. Comments on draft report will be consolidated by ENTRO and forwarded to the consultant. The consultant will revise the report accordingly and submit revised report within two weeks of receiving the consolidated comment.

6. Timeframe

The Consultancy is expected to take a maximum of three months. Out of this the consultant is expected to spend around one month in the field. The schedule of delivery is as follows:

i) Within four weeks of commencement (inception report)

- ✓ A debriefing note that includes comment on the material and information on the project profiles s provided by ENTRO.
- ✓ A work plan on how the consultants will carry out the work including logistical arrangement.
- ✓ A list of delineated watersheds with a map
- ✓ A list of criteria for screening and ranking
- ✓ desk review and suggested sites for field visits (including outline of travel plans and logistics for field visits)

ii) Within three months of commencement

- ✓ A draft final report document which includes:
  - a describes of each of the delineated micro-watersheds in terms of socio-economic and biophysical features
  - list of criteria for screening and ranking
  - The screening and ranking matrix of the projects and a clear written justification of the evaluation of each project against the criteria which is clearly referencing the information used to arrive at this assessment (for each project).
  - List of watersheds in priority order with a potential for detailed preparation of investment project

iii) Within four months of commencement

- ✓ Presentation of findings to a regional workshop
- ✓ Final report after incorporating comments from the regional workshop as well as written comments from ENTRO and other key stakeholders

7. Improvement of Terms of reference

The consultant may offer suggestions and improvements to the Terms of Reference where he/she considers it would result in better implementation of this assignment. Such proposals if accepted will form part of the Terms of Reference of the assignment

8. Implementation arrangement

The task will be undertaken by an individual international consultant. The consultant shall work under the supervision of the Regional Watershed Project Coordinator. All deliverables described in this TOR will be addressed to the Regional Watershed Coordinator. In addition to the deliverables the consultant is expected to submit progress report bi-weekly to the project coordinator. The Watershed Project Coordinator's office is located within ENTRO's headquarter at Addis Ababa, Ethiopia. The coordinator will ensure that the performance of the work is in line with the terms of reference and related norms. ENTRO will be responsible for contract administration and serving as a link between the consultant and country offices. The national coordinators for watershed will facilitate meetings with concerned line ministries and field visits in their respective countries.

9. Required qualification

The required qualification to undertake the task is an MSc degree or above in natural resources management, watershed management, or related fields with more than 15 years of extensive experience in undertaking technical studies in watershed management, preparation and design of watershed projects of a similar scope to those described here, soil conservation and land use planning. Experience of work with in the region and knowledge about the Eastern Nile Subsidiary Action Program and the Eastern Nile Watershed Project will be an advantage. In addition skills in GIS and Remote Sensing related to watershed application is required.

ANNEX 2: COMPARATIVE ASSESSMENT OF PROJECTS BY SUB CRITERIA

Criteria	1 or 2	3	4 or 5
1. Accords with Regional/State, National and NBI-ENSAP policies and strategies.			
Relevant to policies/strategies of Region/State.		All projects aligned with Regional/State policies & strategies	
Relevant to National Policies and Strategies.		All projects aligned with national policies & strategies (a WSM-CRA criteria)	
Relevant policies/strategies of NBI-ENSAP.		All projects aligned with NBI-ENSAP policies & strategies (a WSM-CRA criteria)	
Relates to other interventions/ projects/ programmes. (e.g. other ESNSAP and JMP Projects).		All projects have potential linkages to other interventions/projects/ programmes	
2. Problems related to identified environmental and natural resource hotspots are addressed (Objective).			
Key stakeholders are correctly identified.	Project 9: Wadi Allaqi-Gabgabe (Sudan). Until the baseline survey has been undertaken it is difficult to identify who are the key stakeholders.	All Projects except 9 correctly identified the Stakeholders although it may be either self-selection or other criteria (e.g. chronically food insecure) may identify recipients.	

Project correctly addresses Community needs & underlying problems.		Projects 2: Birbir, 3: Sor, 5: Atbara, 8: Allaqi (Egypt), 9: Allaqi (Sudan) and 10: Alatish-Dinder all address both immediate needs and underlying causes.	Projects 1: Zamra, 4: Telkuk, 6: Butana and 7: Pibor address very pressing immediate needs in terms of food insecurity and challenging environmental conditions.
New natural resources assets are created that contribute to more than one identified need (e.g. social needs/production needs).		NR assets are created that can be used for more than one productive purpose in all Projects except Projects 5 & 7.	Significant NR assets will be produced in the longer term in 5: Atbara (trees) & 7: Pibor (toich grazing)
Project contributes to improved environment and/or reduced environmental degradation that will support sustainable livelihoods of local inhabitants;		Environment is either improved or degradation reduced in all projects except Project 5.	Very severe degradation will be significantly reduced in project 5: Atbara.
Threats to biodiversity (genetic, species and habitat) are reduced.		Threats to biodiversity will be reduced in all projects except Projects 8, 9, 10.	Threats to Biodiversity will be very significantly reduced in project 8: Wadi Allaqi (Egypt), 9: Wadi Allaqi (Sudan) and 10: Alatish-Dinder NP.
3. Accrues Local, Downstream and Global Benefits. **3.1 Local benefits will exceed costs and contribute to:**			
Household income increased and poverty reduced;	Projects 9: Wadi Allaqi and 10: Alatish-Dinder will not have significant impacts on poverty levels of primary	Poverty levels will be reduced in Projects 2: Birbir, 3: Sor, 5: Atbara, 6: Butana, 8: Allaqi (Egypt).	Poverty levels will be significantly reduced given the lower starting poverty levels in Projects 1: Samra, 4:

	stakeholders.		Telkuk, 7: Pibor.
Equitable access to resources by all members of the community increased;		Benefits reach target communities in an equitable manner in all projects.	
Vulnerability of local households to environmental, social and economic "shocks" reduced;		Food security will be increased in all projects except projects 1: Zamra; 4: Telkuk; 6: Butana; 7: Pibor.	Food security will be significantly increased in Projects 1: Zamra; 4: Telkuk; 6: Burtana & 7: Pibor given their high vulnerability to climatic shocks.
Value of natural resources to local communities increased leading to an increased willingness to protect the sustainable supply of services and products from these resources.		Value of N.R. increased in all projects except Projects 3: Sor, 8: Wadi Allaqi (Egypt) and 9: Wadi Allaqi (Sudan)	Value of N.R. substantially increased in Projects 3: Sor, 8: Wadi Allaqi (Egypt) and 9: Wadi Allaqi (Sudan)
3.2 Down-stream Regional benefits will exceed costs and contribute to:			
Environmental costs for down-stream users reduced;		Environmental costs for down-stream users reduced in all projects except: 1: Zamra; 2: Birbir; 3: Sor; 5: Atbara; 7: Pibor	Environmental costs for down-stream users significantly reduced in Projects 1: Zamra; 2: Birbir; 3: Sor; 5: Atbara; 7: Pibor
Vulnerability of downstream households to environmental, social and economic "shocks" that were previously caused by		Vulnerability of downstream households to environmental, social and economic "shocks" reduced in all projects except: 1: Zamra; 2: Birbir; 3: Sor; 5: Atbara; 7: Pibor	Vulnerability of downstream households to environmental, social and economic "shocks" significantly reduced in projects 1: Zamra; 2: Birbir; 3: Sor; 5: Atbara; 7: Pibor

upstream environmental degradation reduced;			
Regional/ trans-boundary cooperation enhanced		Regional/ trans-boundary cooperation enhanced in all projects except projects 9: Wadi Allaqi (Sudan) & 10: Alatish-Dinder	Regional/ trans-boundary cooperation significantly enhanced in projects 9: Wadi Allaqi (Sudan) & 10: Alatish-Dinder
3.3 Global benefits will exceed costs and contribute to:			
Integrity of the global environment enhanced contributing to sustainable livelihoods across the world.		Integrity of the global environment enhanced in all projects.	
4. Risks to project outcomes and outputs can be mitigated.			
	Project 6: Butana and 7: Pibor has the potential for conflict of grazing resources among various pastoral groups over grazing resources. The strategic Land Use Planning and Community level components of the project are designed to reduce this risk.	All projects have no un-avoidable risks except Projects 6 & 7:	

ANNEX 3: PROJECT PROFILES: INVESTMENT PROJECTS (Revised)

PROJECT	CHALLENGES	DIRECT INTERVENTIONS	SUPPORTING INTERVENTIONS	DIRECT BENEFITS	SECONDARY BENEFITS	REGIONAL/ GLOBAL BENEFITS
PROFILE 1. Integrated Watershed management: Tekeze Sub-basin, Upper Zamra Watershed, Ethiopia	• Severe land degradation in area of low agricultural potential • Low but variable rainfall – high crop risk • Poor road & market accessibility • High population densities • land shortage • livestock feed deficits	• SWC on cropland • Area closure on Communal land • Micro credit fertilizer & improved seed • On-farm forage development • Improved Small livestock production • Small-scale irrigation • Crop diversification • Increased value-added (improved processing, storage & quality)	Feeder roads Improved market infrastructure Increased access to market information Capacity building for extension & research Increased access to micro credit Literacy & Skills training	Arresting crop & communal land degradation Increased crop & livestock productivity Increased food security Increased farm incomes Reduced time for biofuel collection Increased access to technology & Information Wider range of livelihood strategies	Improved nutrition & health Increased availability of wild plants Reduced vulnerability to climatic, economic & social shocks Improved access to off-farm employment Improved human and social capital assets	Reduced sediment loads & downstream sedimentation Reduced loss of biodiversity (crop & wild plants) Increased sequestration of wood & herbaceous biomass & soil carbon
PROFILE 2. Integrated Watershed management: Baro-Akobo Sub-basin, Upper Birbir	• Severe land degradation in area of high agricultural potential	• SWC on cropland • Area closure on Communal land • Micro credit	Feeder roads Improved market infrastructure	Arresting crop & communal land degradation Increased crop & livestock	Improved nutrition & health Increased availability of wild plants	Reduced sediment loads & downstream sedimentation Reduced loss of

Watershed, Ethiopia	• Catchment major contributor of sediment to Baro River • High population densities • Increasing land shortage • Increasing livestock feed deficits	fertilizer & improved seed • On-farm forage development • Dairy production • Small-scale irrigation • Crop diversification • Increased value-added (improved processing, storage & quality)	Increased access to market information Capacity building for extension & research Increased access to micro credit Literacy & Skills training	productivity Increased food security Increased farm incomes Reduced time for biofuel collection Increased access to technology & Information Wider range of livelihood strategies	Reduced vulnerability to climatic, economic & social shocks Improved access to off-farm employment Improved human and social capital assets	biodiversity (crop & wild plants) Increased sequestration of soil carbon
PROFILE 3: Southwest Ethiopian Highlands: Participatory Development of Sor Watershed. Baro-Akobo Sub-basin, Ethiopia	• Accelerating deforestation • Severe land Degradation • Degradation and loss of Wetland products & Services • Increasing food insecurity	• Development of Community-based Natural Resource Management organizations • Institution of Community Level land Use Planning • Development of sustainable Wetland and Community Forest management systems	• Feeder roads Improved market infrastructure Increased access to market information Development of Marketing Cooperatives (organic coffee, NTFP's) Capacity building for extension & research Increased access	At the local level an integrated system of natural resource management would be established Agricultural production diversified & sustainably increased Wetlands & forests sustainable managed	• Food security increased supporting sustainable livelihoods and reducing poverty.	• At the Sub-catchment and regional levels equitable access to water resources by downstream irrigators and mini-hydro power developments would be assured. • At the Global level sustainable management and use of the forest resources would ensure the conservation of biodiversity and in particular the wild coffee gene pool.

			to micro credit Literacy & Skills training			
PROFILE 4: Support to Water Harvesting in Telkuk Locality of Kassala State, Main Nile Sub-basin, Sudan	• Erratic & extremely variable run-off • labour intensive construction & maintenance of water harvesting structures • lack of drought resistant crop varieties • shortage of livestock feed	• Multiplication & supply of vetiver grass • Supply improved seed (sorghum, sesame & vegetables) • Supply improved forage grass planting material • Research: cost-effective tera construction & maintenance • Hafir rehabilitation • New hafir construction • Delineation of stock routes	• Capacity Building • Strengthening Extension Service • Support to Micro Finance Institutions (MFI's) • Improved Accessibility and Market Linkages • Support to State-wide Strategic Land Use Planning • Support to Community Level Land Use Planning	Reduced variability of crop production increased livestock feed supply Improved access to markets	Increased food security Improved nutrition & health Increased livestock productivity Increased household incomes	Increased soil carbon sequestered
PROFILE 5. Arresting Gully Erosion and Restoration of Kerib Land, Gederaf State, Atbara Sub-basin, Sudan.	• Extreme gully erosion & loss of rainfed cropland • High rates of sediment delivery to Atbara River	• Establishment tree nurseries • Establishment of forage grass seed banks • Technical support of arresting gully	• Capacity Building • Strengthening Extension Service • Support to Micro Finance Institutions	Loss of cropland arrested Increased supply of fuel wood & wood products increased supply of	Reduced time for fuelwood collection Increased livestock productivity Increased household	Reduced sediment load in Atbara River & sedimentation in Kashm el Girba Reservoir & New Halfa Irrigation Scheme

		erosion • Deep ripping of cropland • Basin construction in cropland	(MFI's) • Improved Accessibility and Market Linkages • Community Woodland Management Planning and Implementation • Support to State-wide Strategic Land Use Planning Support to Community Level Land Use Planning	forage	incomes	Increased plant biodiversity increased soil carbon sequestration
PROFILE 6. Reducing Rangeland Degradation and Improving Livestock productivity in the Butara Plains, in Gedaref State, Atbara & Blue Nile Sub-basins, Sudan	• Rangeland degradation • Lack of access to Rain season grazing areas • Reduced livestock feed supply • Low livestock productivity • Competition for grazing resources among various pastoral/ agro-pastoral Groups	• Designation of new & widening of existing stock routes to wet season grazing areas • Development of livestock water points along stock routes & in wet season grazing areas • Fodder bank development at permanent villages	• Capacity Building • Strengthening Extension Service • Support to Micro Finance Institutions (MFI's) • Improved Accessibility and Market Linkages • Community Woodland Management Planning and	Rangeland degradation arrested Increased livestock feed Improved Animal health Increased livestock productivity Increased animal off-take	Increased access to Livestock Markets Increased households incomes Improved nutrition & health Reduced competition & conflict for grazing resources	Increased soil carbon sequestered Increased floral species biodiversity

	• Conflict between pastoralists & S-M Farms along very narrow stock routes	• Support for Water Harvesting from crop & forage production along wadis • Experimental rotational grazing & aerial seeding • Establishment of Community – based Animal health Workers	Implementation • Support to State-wide Strategic Land Use Planning Support to Community Level Land Use Planning			
PROFILE 7. Reducing Rangeland Degradation and Improving Livestock productivity in the Flood Retreat Grasslands in Pibor County in Pibor-Sobat-White Nile Sub-basin, Sudan	• Short period of soil moisture for pasture production • Livestock feed deficits • Poor/No access to livestock markets	• Support to construction of check dams in depressions • Designation of stock routes to livestock markets • Development of livestock water points • Fodder bank development at permanent villages • Support to Community – based Animal health Workers	• Capacity Building • Strengthening Extension Service • Support to Micro Finance Institutions (MFI's) • Improved Accessibility and Market Linkages • Community Woodland Management Planning and Implementation • Support to State-wide Strategic Land Use Planning Support to	Increased livestock feed Improved Animal health Increased livestock productivity Increased animal off-take	Increased access to Livestock Markets Increased households incomes Improved nutrition & health	Increased species biodiversity

			Community Level Land Use Planning			
PROFILE 8. Livelihoods Support to the Ababda and Bishari Communities in the Wadi Allaqi, Egypt.	• Extremely fragile environment • Strong reliance on charcoal production from scarce Acacia tree stocks • Need for alternative to vegetable production with acute marketing problems	• Tree nursery establishment • Technical support to Acacia tree establishment • Technical support to increase efficiency of charcoal production Technical support to irrigated forage production (including foundation seed supply)	Capacity building	Sustainable charcoal production ensured Secure source of cash from fodder sales	Reduced vulnerability to shocks Increased household income Improved nutrition & health	Improved conservation of biodiversity
PROFILE 9. Establishment of the Dinder-Alatish Transboundary National Park	• Area of high biodiversity threatened from unsustainable grazing and harvesting of NTFPs and illegal hunting • Alatish Park requires Management Plan • Need to harmonize two park Management plans • Communities	• Support to Sudan & Ethiopia to establish formal Transboundary park status and align Park management Plans • Support to Community engagement in Park management Planning, Implementation & Monitoring • Support to both countries for	Capacity Building Strengthening Extension Service Support to Micro Finance Institutions (MFI's) Improved Accessibility and Market Linkages Community Woodland Management Planning and	Increased crop & livestock productivity Increased households incomes Increased employment opportunities Increased protection for wild flora & fauna and habitats	ared experiences in community-based Park management st-effective joint management of the Park as one eco-system, and e strong possibility of international recognition and ability to secure both Government and external funding. cal Communities	Biodiversity preserved and enhanced.

	living in & around the Park rely heavily on water, fuelwood and NTFP's from inside the Parks	information sharing and joint Park monitoring • Livelihoods support to Communities in & around the Parks to reduce pressure on natural resources (domestic & livestock water supplies; on-farm forage development, on-farm & community tree planting; Improved seed)	Implementation Support to State-wide Strategic Land Use Planning ıpport to Community Level Land Use Planning		actively involved and part of Conservation process	
Project 10. Baseline Survey & Research Programme: Proposed UNESCO MAB Biosphere Reserve Wadis Gabgaba and Allaqi, Sudan.	• Remote area • Little information on ecology or livelihoods systems • Need to link with Wadi Allaqi Biosphere reserve in Egypt	• Undertaken baseline survey on Ecology, Livelihood systems & Cultural heritage • Undertake specific detailed studies identified in Baseline Survey	• Support Trans-boundary technical cooperation between Sudan & Egypt • Support application to UNESCO for recognition as MAB Biosphere Reserve for Wadis Gabgaba & Allaqui in Sudan	• Important knowledge gained of Ecology, Livelihood systems and Cultural Heritage • Support for sustainable livelihood opportunities for local Communities identified & implemented	• International recognition of Wadis Gabgaba & Allaqui in Sudan as MAB Biosphere reserve	• Conservation of unique ecosystems & Livelihood systems strengthened