



Nile Basin Initiative



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BENEFITS OF WATERSHED MANAGEMENT IN THE CONTEXT OF A JOINT MULTI-PURPOSE PROGRAMME



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1. THE EASTERN NILE BASIN JOINT MULTI-PURPOSE PROGRAMME

1.1 Introduction

The objective of this paper is to provide a summary of important watershed management considerations and linkages that should be taken into consideration when developing a joint multipurpose programme of basin-wide development investments. In particular the paper summarizes the important benefits that can accrue from sustainable watershed management. The Joint Multipurpose programme of the eastern Nile Basin has been launched and specific reference is made to this multipurpose programme.

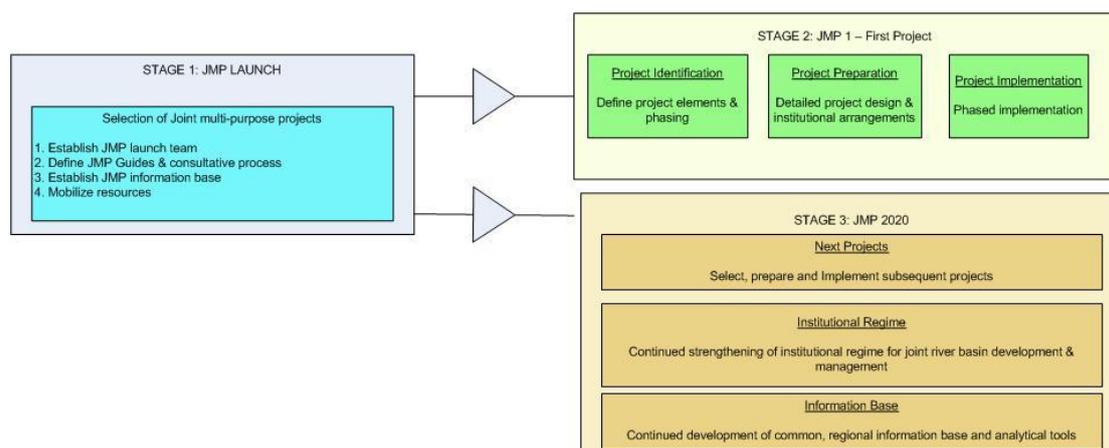
1.2 The Eastern Nile Joint Multipurpose Programme (JMP)

The Eastern Nile Basin and its river systems form an important shared resource for the three riparian countries. However, rising populations, natural resource degradation, increasing levels of poverty and livelihood vulnerability pose serious challenges to sustainable development. It has been recognized that cooperative development and management of the Eastern Nile Basin as one river system offers tremendous opportunities for economic development (ENTRO, 2005). This could be achieved through a multipurpose programme of activities that could increase power supplies, building reservoir capacity and enhancing agricultural production.

In February 2005 the Eastern Nile Council of Ministers (ENCOM) agreed to launch a "first phase of identification of a major programme of multipurpose joint development of the Eastern Nile". ENCOM instructed that the programme preparation should "ensure good practice in economic, social and environmental analysis and consultation". The essence of a system-wide multipurpose programming approach is that the full range of potential benefits can be realized that could not be achieved adopting a uni-lateral approach.

Joint multipurpose investment planning is a complex process across a wide range of sectors and requiring joint decisions by the three riparian countries. A three stage strategic approach has been adopted. The approach is designed to develop tangible investments whilst at the same time building institutional and technical capacity to ensure long-term sustainability (figure 1).

Figure 1. Stages in the Strategic Approach to developing a Joint Multipurpose Programme



Stage 1 of the process – the JMP Launch – is to enable the selection of a first JMP project. It will establish a planning framework to facilitate decisions on the first project accepting that political as well as social, economic and environmental considerations will guide the decision making process. Stage 2 will include project identification, preparation and implementation. Stage 3 – JMP 2020 - will see a series of projects identified, prepared and implemented building on a strong joint institutional framework.

2. WATERSHED MANAGEMENT CONSIDERATIONS IN DEVELOPING THE JMP

2.1 The Elements of the JMP

The key elements of the EN – JMP are shown in table 1. It can be seen that there are four main elements: (i) Watershed and Environmental Management, (ii) Enhanced Agricultural production, (iii) Infrastructure with linked river and power systems, and (iv) Leveraged Growth and Integration. Two enabling elements are (i) an Eastern Nile Information Base and (ii) Established Institutional regimes.

Table 1. Potential Key Elements of an Eastern Nile Joint Multipurpose Programme		
COMPONENT CATEGORY	POSSIBLE INVESTMENT COMPONENTS	POTENTIAL BENEFITS
Watershed & Environmental Management ↓	<ul style="list-style-type: none"> • Reforestation • Erosion control & bank stabilization • Ecosystem conservation 	<ul style="list-style-type: none"> • Improved agriculture, forestry & fisheries • Biodiversity conservation • Erosion mitigation • Carbon sink
Enhanced Agricultural production	<ul style="list-style-type: none"> • Improved rainfed agriculture • Irrigation Development & improvement • Livestock & fisheries development • Agribusiness & marketing 	<ul style="list-style-type: none"> • Food security • Increased agricultural & fisheries yields • Enhanced livelihoods • Regional trade & integration
Infrastructure: linked river & power systems	<ul style="list-style-type: none"> • Integrated reservoir & river regulation system • Power generation & regional transmission system 	<ul style="list-style-type: none"> • Hydro-power production & trade • Flood & drought mitigation • Sediment management • navigation • Water conservation • Carbon offsets
Leveraged growth & integration	<ul style="list-style-type: none"> • market infrastructure • Electrification & communications • Transport (road, river, rail, air) • Private sector development • Tourism 	<ul style="list-style-type: none"> • Industrial & commercial development • Increased market access (incl. export) • Diversified economies • Regional trade & integration

EN Information Base

- Modeling & information management tools
- Cooperative Regional Assessment (sector &/or sub-basins)
- Pre-/feasibility studies (site specific information)

Institutional Regimes

- Stakeholder engagement & communication
- Range of collaborative institutional arrangements (e.g. joint development, joint management, joint asset ownerships)

Range of financing options (e.g. public (loans, grants) & private financing & guarantees)

Source: ENTRO (2005)

Watershed and environmental management and enhanced agricultural production are so closely related as to be inseparable.

2.2 Key Considerations in JMP Development

To be successful any JMP must address the high rates of poverty and unsustainable livelihoods affecting many of the peoples of the Basin. Fundamental to this goal are the two elements: Watershed and Environmental Management and Enhancing Agricultural Productivity. These are the root causes of the downward spiral of poverty and natural resource degradation. Without addressing these elements the full benefits of linked river and power systems and of economic growth multipliers will not be realized.

In the absence of watershed management interventions soil erosion and degradation and deforestation will continue at accelerating rates, reducing agricultural productivity and increasing the numbers of households "churning" at and below the poverty line. The Distributive Analysis of the Watershed Management CRA conservatively estimated the economic costs¹ of the degradation of the natural resource base in the Eastern Nile Basin are currently some US\$ 670 million a year and will reach US\$ 4.5 billion a year in 25 years time. In social terms the costs of poor nutrition on health and well-being are manifested in physical pain and suffering. In political terms it can

¹ Of only those costs that could be quantified – many costs of resource degradation were not possible to quantify in the time available.

lead to a breakdown in social order and increased levels of resource-based conflicts.

Many resource degradation processes have impacts not only locally, but downstream within and beyond the borders of the country within which they occur as well as impacting on the global community. The Distribution Analysis estimated that of the measurable degradation costs some 45 percent were incurred in-country, 9 percent were incurred in a downstream country and 46 percent were incurred globally. All the regional costs were incurred because of sedimentation in reservoirs and around power turbine intakes, the need for flushing during periods of high sediment loads and the loss of power generation, costs of cleaning of irrigation canals and the loss of irrigation water due to sedimentation in reservoir live storage. Other costs of high sediment loads not quantified in the analysis include damage to irrigation pumps and the increased costs of water purification for domestic water supplies.

A sustainable watershed management programme is thus a critical and indispensable element in the development of the multi-purpose programme. Some of the costs of not doing so have been outlined above. The benefits of doing so are outlined in the next section.

3. BENEFITS OF WATERSHED MANAGEMENT TO A MULTI-PURPOSE PROGRAMME

3.1 Watershed Management Interventions

To address both the proximate and the root causes of natural resource degradation in a river basin context requires a very broad-based programme of direct and supporting interventions. At the micro-catchment level the direct interventions must be well integrated and address degradation problems of the landscape as a whole. They require a mix of interventions that target

individual and communal lands, cropland and grazing lands and rainfed and irrigated lands. The interventions must focus on raising or stabilizing agricultural productivity and must be financially and culturally acceptable to the individual and communal investor.

At a higher level the interventions must address the root causes of low investment in sustainable land management (SLM) practices. The Distribution Analysis clearly revealed that whilst many SLM investments are financially profitable in the medium term there is often a period of years of negative returns that many resource poor farmers and communities can not afford. The poorly functioning market systems with the Eastern Nile Basin are a major cause of high transaction costs to farmers leading to low crop and livestock prices and high input costs, further exacerbating ability to undertake SLM investments. Off-farm income is a vital element in many farm and pastoral households' livelihood strategies but weak rural-urban linkages mean that employment opportunities in the many small urban centres do not exist.

Thus a watershed management programme must comprise supporting interventions such as improved access to markets through feeder road construction; improved access to micro credit and the provision of safety net support such as food or cash for work; skills and literacy training to increase access to off-farm employment and technical support to small and medium scale enterprises to increase employment levels.

3.2 Benefits accruing to Watershed Management Interventions and their relevance to the JMP

The benefits of a watershed management programme of interventions to a joint multi-purpose programme can accrue at four levels: household/community, National, Regional/Sub-basin and Global.

The results of the benefit:cost analysis of on-farm and community level interventions demonstrate that there is significant potential for arresting degradation of the natural resource base, increasing agricultural productivity,

increasing food supply with improved levels of nutrition and health, reducing vulnerability to climatic, social and economic shocks. As indicated above there are situations where short-term support (e.g. credit, food/cash for work) may be required. Many interventions have secondary impacts. For example: interventions that increase accessibility to fuel wood (on-farm tree planting) together with the reduction in firewood consumption (improved stoves) will considerably reduce the work loads of women and children. In addition, there will positive impacts on their health and well-being through reduced smoke inhalation thus reducing the incidence of respiratory diseases.

The supporting interventions will have substantial positive impacts on households and communities. Measures to increase market accessibility and integration such as feeder roads and extension of telecommunications will reduce market transaction costs thus benefiting both producers and consumers. This will result in an expansion of local economic multipliers particularly through increased purchases of local non-tradable goods as well as backward (increased purchases of inputs) and forward multipliers (from an increase in marketed agricultural goods). These will in turn increase employment opportunities in many small urban centres. At the national level regional multipliers will also increase: backward and forward as well as the growth of tertiary and secondary urban centres thus stimulating Sub-regional economies.

Increased physical accessibility together with the capacity building, literacy and skills training interventions will increase access to information, social services (health and education) and knowledge of improved technology. Support to the agricultural Extension and Research Services with improve linkages between farmers, extension and research workers will increase the relevance of research to the traditional rainfed farming sector.

At the national level, by targeting the traditional agricultural sector (rather than the commercial agricultural sector) a proportionally greater impact will be achieved in reducing the numbers of households living below the poverty line.

At the Sub-basin level, whilst currently there is little trans-boundary trade between Ethiopia and Sudan, with the expansion of the Sub-regional economies on both sides of the border together with improved cross-border roads links the potential for increasing integration of Sub-region economies of both countries becomes possible, most particularly in the Tekeze-Atbara and Abbay-Blue Nile Sub-basins. Closer cooperation with crop early warning systems, establishing joint strategic grain reserves and local purchases of grains for food relief will enable faster responses to local food shortages on both sides of the border.

The quantifiable benefits of reduced erosion in the Ethiopian Highlands and sediment loads in the Abbay-Blue Nile and Tekeze-Atbara river systems on reducing costs within Sudan of dredging of power intakes and irrigation canals, loss of power generating potential due to the need for reservoir flushing, are relatively small in comparison to the national benefits. Nevertheless, these reductions will also contribute to reductions in costs that it has not been possible to quantify: of pump and turbine damage and the removal of sediment for domestic and industrial water supplies. WSM measures in the upper Dinder and Rahad catchments will reduce sedimentation of the maya'a wetlands thus reducing the incidence of flooding of agricultural lands.

At the global level there are a number of opportunities for increasing the sequestration of carbon dioxide and for conserving genetic, species and habitat biodiversity. The opportunities for carbon sequestration are particularly substantial in the area of increase soil carbon – a hitherto neglected area. Soil carbon increases under well managed or enclosed pastures and rangeland. The proposed interventions for establishing a Transboundary Park incorporating the Dinder and Alatish Parks will bring substantial benefits to conserving biodiversity in this important area. Similar benefits will accrue with trans-boundary cooperation in the Gambella and Boma National Parks.

4. CONCLUSIONS

The primary objective of the Joint Multipurpose programme is arrest natural resource degradation, alleviate poverty and support more sustainable livelihoods for the peoples of the Eastern Nile Basin.

Watershed Management and its impact of enhancing agricultural production is the key element in developing any multi-purpose programme given its potential to break the vicious cycle of poverty and resource degradation. The costs of not implementing watershed and environmental management interventions are expected to rise from US\$ 670 million a year to US\$ 4.5 billion a year in 25 years time. The social and political costs of inaction could be catastrophic. Indeed, it is clear from the analysis that any Joint Multi Purpose Programme without a Watershed Management component would not be viable. It would not be viable economically, socially, technically or environmentally. Without such a component degradation of the natural resource base will accelerate, poverty levels will increase and households will increasingly face vulnerability to climatic and other shocks.

The benefits accruing to a broad-based programme of direct and supporting watershed management interventions will have positive impacts at four levels: household/community, national, regional and global. Degradation of the natural Resource will be arrested, enhanced productivity will raise households out of grinding poverty and their livelihoods will be secured from external and internal shocks. These benefits from an expansive watershed management component contribute incalculably to the overall goal of the JMP of poverty reduction and a sustainable utilization of the natural resource base.