

## PROJECT BRIEF

### 1. Identifiers

<b>Project Number:</b>	
<b>Project Name:</b>	Environmental Protection and Sustainable Management of the Okavango River Basin.
<b>Project Duration:</b>	3 years
<b>Implementing Agency:</b>	UNDP
<b>Executing Agency:</b>	Angola: Ministry of Energy and Water Botswana: Ministry of Mines, Energy & Water Affairs Namibia: Ministry of Water and Rural Development
<b>Co-ordinating Agency:</b>	OKACOM (Okavango Basin Commission)
<b>Co-operating Agency:</b>	UN Department of Environmental & Social Affairs
<b>Requesting Countries:</b>	Angola, Botswana, Namibia
<b>Eligibility:</b>	Eligible under para. 9(b) of the GEF Instrument
<b>GEF Focal Area(s):</b>	International Waters
<b>GEF Programming Framework:</b>	Operational Programme #9: Integrated Land and Water Multiple Focal Area

2. **Summary:** The Okavango River Basin (ORB) remains one of the least human impacted basins on the African continent. Mounting socio-economic pressures on the basin in the riparian countries, Angola, Botswana and Namibia, threaten to change its present character. It is anticipated that in the long term this may result in irretrievable environmental breakdown and consequent loss of domestic and global benefits. Maintaining these benefits requires agreement over the sharing of both the benefits and associated liabilities (to include those of an environmental and ecological nature) through joint management of the basin's water resources. The 1994 OKACOM Agreement, 1995 SADC Protocol on Shared Watercourse Systems and the 1997 UN Convention on the law of the non-navigational uses of international watercourses provide a framework for such an agreement. Under the OKACOM Agreement, the riparian countries are working toward the implementation of an Integrated Management Plan (IMP) for the basin. However, the current focus for analysis, communication, policy and institutional development is limited. GEF support will help mitigate transboundary externalities and secure global benefits and also provide national economic and environmental benefits. This preliminary project will enable the formulation of a Strategic Action Programme (SAP) to structure inputs and resources prior to implementation of a larger joint programme of action. The SAP formulation will involve completion of the draft Transboundary Diagnostic Analysis (TDA) begun during Block B implementation and launch policy initiatives to enable all three countries to agree a programme of joint management. The SAP will include necessary baseline and additional actions to address the priority transboundary issues and provide an essential monitoring and evaluation tool for implementation. The project provides for a process of formal endorsement of the SAP by the participating governments, support to the translation of SAP provisions into national policy and legislation, and the mobilisation of institutional and investment resources for its implementation.

**3. Costs and Financing (Millions \$US)****GEF**

Project Direct Costs	\$ 4,745,500
Project Support Services	\$ 380,000
PDF (Block A and B)	\$ 374,000
<b>Sub-total GEF</b>	<b>\$ 5,499,500</b>

**Co-financing:**

## Implementing Agencies:

World Bank	\$ 300,000
UNDP	\$ 200,000
Bilateral	\$ 200,000
Governments	\$ 1,625,000
NGO	\$ 100,000
<b>Sub-total</b>	<b>\$ 2,425,000</b>

**Total Project Cost: \$ 7,924,500**

**4. Associated Financing:**

Estimates of capital and recurrent water sector investment in the three countries a significant percentage of which will be reallocated through project leverage.

Angola	\$ 8,000,000
Botswana	\$ 9,000,000
Namibia	\$ 12,500,000
<b>Sub-total Associated Finance:</b>	<b>\$ 29,500,000</b>

**5. Operational Focal Point Endorsement:**

Name: Mr. A Gomez da Silva Title: Director General  
 Organisation: Ministry of Energy and Water, Angola  
 Date: 11 December 1998

Name: Mr. Mushanana Nchunga Title: Executive Secretary  
 Organisation: National Conservation Strategy Agency, Botswana  
 Date: 11 December 1998

Name: Mr. S. Simenda Title: Deputy Permanent Secretary  
 Organisation: Ministry of Environment & Tourism, Namibia  
 Date: 11 December 1998

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<b>Conventions/UN Resolutions/Regional Protocols</b>	<b>Angola</b>	<b>Botswana</b>	<b>Namibia</b>
Bio-diversity	Ratified	Ratified	Ratified
Climate Change	Pending	Ratified	Ratified
Desertification	Ratified	Ratified	Ratified
Ozone Depletion	Pending	Ratified	Ratified
RAMSAR		Ratified	Ratified
UN General Assembly Resolution 51/229: Convention on the law of the non-navigational uses of international watercourses	Signed	Signed	Signed
SADC Protocol on Shared Watercourse Systems	Signed	Ratified	Ratified

## ACRONYMS

APR	Annual Programme Review
PMU	Project Management Unit
DWA	Department of Water Affairs
DNA	Direcção Nacional de Águas
EA	Environmental Assessment
FAO	Food and Agricultural Organisation
GEF	Global Environment Facility
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
GHABIC	Angolan Authority of the Cunene River Basin
IA	Implementing Agency
IMP	Integrated Management Plan
IUCN	International Union for the Conservation of Nature
IW	International Waters
JIMP	Joint Integrated Management Programme
LEARN	Learning Exchange and Resource Network.
NCU	National Co-ordination Unit
NGO	Non Governmental Organisation
NWRMR	Namibian Water Resources Management Review
OBSC	Okavango Basin Steering Committee
OKACOM	Permanent Okavango River Basin Commission
ORB	Okavango River Basin
OP	Operational Programme
OS	Operational Strategy
PIR	Project Implementation Review
PMC	Project Management Committee
PPER	Project Performance and Evaluation Review
PSC	Project Steering Committee
SADC	Southern Africa Development Community
SAP	Strategic Action Programme
TDA	Transboundary Diagnostic Analysis
TPR	Tri-partite Review
UN DESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme

## I. PROJECT CONTEXT AND BASELINE COURSE OF ACTION

1. General Context. The Okavango River Basin (ORB) is shared by three nations, Angola, Botswana, and Namibia. A map of the basin is presented in Annex IV. The basin straddles sub-humid climatic zones in Angola through semi-arid to arid climatic zones in northern Namibia and Botswana where freshwater sources are scarce. The basin's source in the Angolan Province of Cuando Cubango is relatively undeveloped with few wholesale water demands made upon the watercourses of the source sub-basins, the Cubango and Cuito. As the main tributaries converge on and run along the border with northern Namibia, human development alongside the trunk water course intensifies. In Botswana, the ORB drains into the Kalahari desert as an alluvial fan, commonly known as the Okavango Delta which forms part of a large national wetland reserve. Periodic outflows from the apex of the fan to the Chobe channel linked to the Zambezi basin occur but the bulk of the flow drains to the distal margin of fan which is bounded by geological faults across which flood flows intermittently drain and flow into the Boteti river to evaporate in the Makgadikagadi basin.

2. The Hydrological Context. The ORB has a topographic catchment of approximately 704,000 km<sup>2</sup> and a length from basin divide in Angola to the distal margin of its terminal fan of approximately 1,100 km. The economic and ecological vitality of the ORB and its associated wetlands depends upon the detailed character (timing, volumes, duration) and quality of the annual flow regime generated in the source catchments of Angola. Over the Angolan portion of the basin, from the mean annual rainfall of approximately 800 mm, only 58 mm appears as flow at Rundu (Cubango sub-basin) and 74mm at Dirico (Cuito sub-basin). At the head of the Delta, at Mohembo, the combined annual yield of both these sub-basins is reduced to 44 mm. By the time flow has traversed the Delta, despite the addition of a further 4-500 mm in direct rainfall over the area of the fan itself, outflows from the fan are negligible in most years. The bulk of the loss over the area of the Delta is through evaporation and evapotranspiration from surface and shallow groundwater. Potential rates of evaporation over the fan are in the order of 2,000 mmyr<sup>-1</sup>. All transmission and evaporative losses along the course of the ORB are essentially non-negotiable if the basin is to retain its present hydrological and ecological character. In addition, the evaporation component of the hydrological cycle is a key element of the basin's micro-climate which supports specific aquatic habitats. As a low gradient hydrological "sink" in an arid quarter of southern Africa, the fan is highly sensitive to variations in tectonic and climatic regime, but is equally sensitive to man-induced threats and there is now preliminary evidence that the hydro-environmental integrity of both the source and the sink of the ORB is under threat from such activities.

3. Environmental Context. Freshwater is the prime environmental and socio-economic resource and agent in the ORB directly supporting all human activity, vegetation and wildlife habitats and their associated productivity. Freshwater sources are also the natural resource component most at risk since there is no economic substitute for the basin's watercourses and associated aquifers while they are also the final repository of anthropogenic waste. The status of the sources and the characteristics of the freshwater balance in the basin as a whole is therefore key not only as a critical resource for development, but also as an irreplaceable global environmental asset. The Okavango Delta has been designated a RAMSAR site on the basis of its wetland values and also contains the globally important Moremi Protected Area. The flood and baseflow to the fan sustain a unique wetland environment which supports significant regionally and globally significant biodiversity with a large number of endangered and threatened species.

4. System boundary. The functional system boundary for water, land, forest and wildlife comprise much smaller sub-sets of the basin's geographic limit. This is because the hydrologically active area of the basin is much smaller than the topographic limits of the basin in Botswana and Namibia. Equally, only a part of the basin's population and communities bounded by the topographic divide in Namibia and Botswana are directly engaged with the water resources of the basin. However, there are significant external linkages beyond the hydrological and topographic system envelopes, notably; demands for water abstraction in Namibia originating beyond the topographic limits of the basin; political

instability in Angola as a whole is causing waves of de-population and re-settlement in the basin; and the wetland environment of the fan in Botswana provides staging area for birds migrating to southern Africa during the boreal winter and is a storehouse of globally significant biodiversity. Thus the impact of water body degradation would have ramifications far beyond the physical boundary of the basin.

5. Socio-economic Context. The pressures on the water resource base and associated environments of the ORB are driven by population growth and shifts in consumption patterns. While the population within the ORB is currently estimated at approximately 580,000 (250,000 in Angola, 140,000 in Botswana, and 190,000 in Namibia), the pent-up demands for raw water from population centres outside the basin in Namibia and Botswana are now significant. The intra-basin population comprises predominantly mixed agro-pastoral low income communities who are highly dependent upon the freshwater resources of the basin for their basic subsistence and income generation. By contrast, the extra-basin population creating pressure for inter-basin transfer is largely urban with associated industrial demands. The productivity associated with freshwater use and its related aquatic ecosystems is estimated at approximately 25% of GDP in the basin as a whole although there is considerable inter-country variability. In Angola, civil war has resulted in a decline of population, commerce, and trade, so that current use of the basin's water resources are limited to water supplies to small regional centres and some small scale floodplain irrigation. In contrast, Botswana's mineral led growth is putting pressure on its vital freshwater resource base as urban centres on the fringe of the Delta expand. There is also significant demand for amenity use of the Delta largely from international tourists. Namibia is attempting to manage demand for water but is also facing unprecedented levels of demand for municipal and industrial water, particularly in its central area which lies outside the topographic and hydrologically active system boundaries of the ORB. The ORB is the only perennial river system that lies within Namibia and is therefore the first candidate in Namibia's search for new water. These disparate levels of dependence upon the basin's natural resource base in each country create barriers to harmonised development of the basin as a whole. In addition there is concern in both Botswana and Namibia that current national patterns of development are not sustainable. State of the Environment (SoE) reports dealing specifically with water have recently been commissioned by the Ministries responsible for environment in both countries.

6. Policy Context. Recognising the significant regional and global values of the Okavango River Basin, the Governments of Angola, Botswana and Namibia convened the first meeting of the riparian States in Windhoek in 1993. The Permanent Okavango River Basin Commission (OKACOM) was subsequently established in September 1994. The countries are committed to the negotiation of all transboundary water issues through OKACOM where they place high level inter-ministerial representation to advise on all technical and policy issues to do with the water resources of the basin. The countries have made it clear that they intend to continue this reliance on OKACOM to address technical and policy issues regarding water resources in the basin. This is seen as strengthening the rationale for a GEF intervention. For example, a key issue for this project will be prior notification between the riparian countries. Under the Helsinki Rules (Article XXIX) invoked in the 1994 OKACOM Agreement, riparian countries are required to give prior notification of planned and unplanned measures affecting the ORB. Thus, at regional level, the 1994 OKACOM Agreement, the 1995 SADC Protocol on Shared Watercourse Systems and the 1997 UN Convention on the law of the non-navigational uses of international watercourses provide a framework for national policy initiatives to converge on an agreed programme of joint management.

7. Commissioners of OKACOM are appointed by the respective cabinet offices and the Commission reports at cabinet level in all three countries through the respective Ministers. In Angola this is the Ministério da Energia e Águas, in Botswana the Minister of Mineral Resources and Water Affairs and in Namibia, the Minister of Agriculture, Water and Rural Development. Meetings are held in rotation at national capitals and the Departments of Water Affairs in Botswana and Namibia and GABHIC (The Cunene River Basin Authority) in Angola service the secretariat function within OKACOM. Prior to the establishment of OKACOM, Botswana had been supporting research in ORB system in collaboration with

donors and had cancelled a major water development project for the southern margin of the Delta on the basis of an independent IUCN review in 1992. Namibia had included the option of abstraction from the Okavango in its Central Area Water Master Plan published in 1995.

8. The national development policies of all three countries are centred on maintaining or increasing rates of growth while also addressing poverty alleviation and sustainable livelihoods. Freshwater resources are critical to pursue these national interests. The relevant national policies in Angola are associated primarily with the development priorities in Cuando Cubango Province as peace becomes re-established and with the commitment to co-ordinate basin level activities through GABHIC, under the Deputy Minister for Water. The relevant national policies in Botswana are linked very much to wildlife and nature conservation in the Delta where the Government is promoting eco-tourism and wildlife management. Botswana is also in the process of developing a Wetlands Policy and Strategy which will facilitate proper utilisation and management of resources in the Okavango Delta and other wetlands in the country. At the same time, Botswana is developing groundwater on the margins of the fan to serve urban expansion and mining activities. Caught between these two riparians, Namibia's policies are conditioned by an imperative to increase water supply for the central area of the country and an active policy of devolution of natural resource planning and management to the regions. These policy directions need to be co-ordinated if the ORB resources are to be managed in a sustainable fashion.

9. Institutional Context. The countries recognise that various ministries and other government entities at national level have an interest in the work of the project and its effective implementation. The countries are committed, through their presence in OKACOM, to involve the appropriate ministries and government and non-governmental organisations (NGOs) necessary for the completion of a TDA and the formulation and implementation of a SAP. There are several dozen NGOs in the basin that are active in monitoring & research, policy, habitat conservation, institutional strengthening, public awareness and education programmes dealing with critical environmental problems in the ORB. This commitment to stakeholder participation will also strengthen the engagement of key ministries with the process and thus help ensure country commitment to implementation. Despite the urgent need to co-ordinate at regional level, national co-ordination between lead agencies involved in water and environment needs to be strengthened and for a clearer separation of policy and operational (user) functions to emerge. In Angola, the Direcção Nacional de Águas (DNA) of the Ministry of Energy and Water and Ministries of Environment and Planning play strong roles at the national and international levels for all Angola's shared river basins through the Authority of the Cunene River Basin (GABHIC). In Botswana, the Department of Water Affairs under the Ministry of Minerals, Energy and Water Affairs is the lead agency in water resources and provides support to the National Conservation Strategy (Coordinating) Agency in the implementation of the National Conservation Strategy. In Namibia, the key institutions are the Department of Water Affairs under the Ministry of Agriculture, Water and Rural Development and the Environmental Directorate in the Ministry of Environment and Tourism. This institutional setting at national level is reflected in OKACOM where cross-sectoral co-ordination and cross-disciplinary collaboration is not yet effective. While OKACOM has the mandate to convene all relevant agencies and institutions, in practice this has been difficult to effect since governments' professional resources are severely stretched. Effective consultation and co-ordination at national and regional level is therefore an essential pre-condition for the successful formulation and implementation of an integrated management plan. This presents prime opportunity for GEF support to help clarify policy and institutional linkages to achieve co-ordinated management of the ORB.

10. OKACOM is thus the key inter-governmental institution in co-ordinating integrated approaches to the development and protection of the basin. Accordingly, the mandates, functions, commitments and resources invested within OKACOM need to be reviewed during formulation of any programme of joint management to assure countries that it will be able to discharge its role effectively during subsequent implementation.

## THE BASELINE COURSE OF ACTION

11. In 1995 OKACOM declared its commitment to the implementation of an Environmental Assessment (EA) and an Integrated Management Plan (IMP) for the basin. The proposal for the EA and IMP recognised the threats to the basin and the need for joint management to protect national interests. No explicit consideration of global objectives in terms of the GEF Operational Strategy or International Waters Operational Programmes were given at this stage. OKACOM formally requested the assistance of the GEF in August 1995, requesting UNDP to assist in the development of a GEF supported programme for the Okavango River Basin. Consequently, GEF PDF Block A and then Block B resources were used in 1996 and 1997 to begin removing critical barriers in regional co-operation and analysis and working toward the development of a joint management programme.

12. A draft Transboundary Diagnostic Analysis (TDA) has been compiled as part of the PDF B activities. The draft TDA has initiated a consultative process with basin stakeholders, established the current status of the basin as a whole, identified causes of degradation, and imminent threats, and indicated critical gaps in information, policy and institutional arrangements. This is the first attempt of its kind to analyse the hydro-environmental and socio-economic information available in all three riparian countries. The Table of Contents for the current iteration of the draft TDA is presented in Annex VI to indicate the scope and depth of this work. The draft TDA will be expanded as gaps in the analysis are filled and the TDA will include a thorough review of the competencies and comparative advantages of OKACOM as a basin organisation in preparation for SAP implementation. This analysis of the effectiveness of existing mechanisms and clear recommendations for improvement of both OKACOM and all the related policy, legal and institutional arrangements at national and regional level is an important test of the GEF intervention.

13. Environmental Threats. The chief threats to the ORB arise from patterns of development that cannot be effectively co-ordinated. It is apparent from the draft TDA findings that the natural resources of the basin are already subject to demands for water and land from agriculture, urban and industrial development both within and outside the basin. The externalities generated by these demands are already resulting in modified quantity, quality and sediment flows. There are also minimum requirements for the basin to be met if it is to continue to furnish its flow of environmental benefits and maintain a critical stock of freshwater assets. However, the national institutional and policy responses to date has been one of supply management. In financial, economic and environmental terms this approach is not sustainable. Regional demands for raw water have to be managed in a co-ordinated fashion and an integrated joint management plan with a comprehensive approach to demand management is therefore essential. If these threats are not addressed through such management, irreversible changes in the basin's water balance, and hydrochemical and hydrogeomorphological responses are anticipated. Such changes will impact the productivity and environmental integrity of the basin as a whole.

14. Causes. The proximate cause of environmental degradation is three fold; continuation of unplanned abstraction from watercourses and aquifers; growth of effluent disposal and non-point pollution sources; and the accelerated erosion of land hydrogeomorphologically linked to the basin. But the root causes lie with patterns of socio-economic development - population growth, urbanisation and industrialisation. Key factors in these trends are; over-grazing which is already resulting in accelerated land and soil degradation in Namibia and Botswana; unplanned development in Angola along de-mined transport corridors in the Cubango and Cuito sub-basins as post civil-war re-settlement occurs; and pressure for new and increased abstraction of raw water to service urban expansion and irrigated agriculture. It is anticipated that these factors will continue to accelerate new demand for raw surface and groundwater in the basin, and its immediate region, and accelerate the process of land use conversion for subsistence agriculture. But it is equally apparent that the trends are outpacing policy and institutional response in the riparian countries and it is to address these intermediate causes where co-ordination is necessary and where improved understanding can drive the required policy shifts.

15. **Baseline.** The expected baseline course of action in the ORB is directed at national interests, primarily socio-economic development (whether planned or informal) through the promotion of water services for rural and urban water supply and sanitation, small scale irrigation and stock watering. Only a small portion of the national baselines are directed specifically to water resource management in the ORB. Further details of the baseline are given in the Incremental Cost Analysis presented in Annex I.

16. **Angola:** Since independence in 1975, there has been no appreciable inward investment to the basin. A proposed regional re-habilitation programme for Cuando Cubango Province formulated in 1995 will supply a considerable amount of infrastructure related to water supply, sanitation, agriculture and transport. However, under present circumstances these activities cannot be verified. In 1997 World Bank has proposed an Agricultural Sector Investment Programme part of which may be expected to assist smallholder and commercial farmers in the Province. The World Bank is also preparing a national Water Sector Development Project which is expected to channel resources for water supply and sanitation to major provincial capitals, Cabinda, Lubango, Lobito-Benguela, Luanda and Namibe. None of them is in Cuando-Cubango province. A separate World Bank technical assistance project is under preparation which will encompass national programme of water policy institutional development and transboundary water resources. A pilot river basin management component on the Cunene basin, adjacent to the ORB is also being considered. This work will complement Norwegian Government assistance to national hydrometric services and water resource assessment for other priority basins, but not including the Cubango or Cuito sub-basins.

17. **Botswana:** The Government of Botswana is committed to the implementation of their 8<sup>th</sup> National Development Plan for the period 1997/8-2002/03. In this period, the Plan anticipates various capital development projects and studies, elements of which are related to water management in the vicinity of the Okavango Delta. These national plans include; Major Village Water/Sanitation Development; Groundwater Studies and Protection; Hydrological Support including updating of the Okavango Forecasting Model; and International Water Planning and Development.

18. **Namibia:** Under its First National Development Plan (NDP1) for the period 1995/6-1999/2000, the Government of Namibia's support to the Okavango region and Caprivi Strip focuses on health and education sectors with a programme of rural water supply and sanitation supported by GTZ. Additional community development activities are carried out by Namibian and international NGOs. A World Bank/GTZ/UNDP Water Resource Management Review (NWRMR) was launched in early 1998 with total resources of US\$ 1,100,000. Elements of this exercise will be directly related to transboundary water issues, including the Okavango. Despite this, the Government of Namibia has made provision for feasibility studies for the construction of an emergency pipeline from Grootfontein to the Okavango at Rundu. The preliminary feasibility work carried out in 1997 amounted to approximately US\$ 1,500,000.

19. **Hydrological analysis:** Current detailed hydrological, hydrogeological and hydrochemical information for the ORB is fragmented and, in the case of Angola, entirely absent. The basin has no regulatory or control structures at which flows can be determined accurately. Validation and verification of resource development options (both in terms of quantity and quality) is therefore dependant upon high quality continuous stage/discharge information at key natural channel reaches in the basin, particularly in relation to the relative contribution of the Cubango and Cuito sub-basins and their associated catchments in Angola. At present, the water resource records from Angola are limited to variable sets of level readings and gaugings for the period 1963/4 to 1969/70 in the Cubango and Cuito sub-basins, principally in the upper catchments. There is no systematic measure of the relative yields of the sub-basins before they cross the Namibian border. The former gauging locations in Angola are known to have been selected on the basis of ease of access, not reach stability so that their stage/discharge relationships are suspect. The only permanent cableway from which an accurate stage/discharge relationships has been determined is at Mukwe in Namibia. The gauged flows at Mukwe are routinely compared with the level readings at an unsuitable section at Mohembo in Botswana to establish an agreed inflow to the

'panhandle' in Botswana. The hydrometric network described above is not sufficient to determine and monitor the amount of water, its quality, timing and availability throughout the system that is needed to sustain the various consumptive and non-consumptive uses for water, and for the Okavango Delta in particular, nor does it provide a system to verify compliance with a basin-wide joint management plan. The riparian countries have no specific national plans for the improvement of hydrometric monitoring on the ORB.

20. **Information availability.** Government departmental libraries, national research institutes, and universities all maintain indexed hardcopies of relevant reports and maps and some digital data, but in a variety of formats. Access to these sources in the ORB region is therefore limited. Hydrological and hydrogeological information for the Angolan portion of the basin was taken out of the country at Independence in 1975 and is believed to reside in Lisbon, Portugal. Since 1975 there has been no additional hydrometric data gathered for the Cuito and Cubango sub-basins. Equally, much original research on the Okavango Delta resides with research groups at universities in South Africa and Europe. Much of the collected data and subsequent analysis is either sector based, academic or focused on the Delta.

21. Consequences. The national policy focus and institutional arrangements are not sufficiently co-ordinated at national or regional level to address threats to the basin's freshwater resources. The consequences are two-fold. First, the primacy of national interests is resulting in the imposition of transboundary externalities; these include: quality and quantity losses of water supplies for urban centres in the basin (Rundu, Maun); reduced supplies for irrigated agriculture (Caprivi and fringes of the Delta); degraded stock watering (Caprivi, Ngamiland); reduced supplies for mining (Orapa); loss of biodiversity; and compromised nature tourism (Caprivi, Panhandle, Delta.). Second, the costs of co-operation are high where barriers to communication and understanding persist.

22. Required actions. Barriers to transboundary management and the achievement of global benefits are manifest under the baseline. To overcome these barriers, understanding of environmental issues, consultation and commitment to alternative course for sustainable development needs to be addressed. The principal barriers and constraints include:

- Policy, Institutions and Co-ordination - there is no basin-wide policy perspective. The current policy focus on national issues will not result in the sustainable development of basin and OKACOM lacks expertise and the capacity to co-ordinate effectively. OKACOM therefore needs to be in a position to establish this perspective and drive a programme of joint management with the appropriate political and financial support.
- Awareness, Consultation and Communication - there is a lack of cross sectoral and stakeholder consultation and communication which is inhibiting participation, commitment, and investor buy-in. To address this issue, national and regional consultative fora need to be scaled up, particularly during the intensive planning stages.
- Information and Analysis - there is a fundamental lack of understanding of the threats and opportunities of the hydro-environmental and socio-economic systems of the basin as a whole. This is particularly the case for the Angolan portion of the basin. Alternatives cannot be evaluated and transboundary economic assessments made. Knowledge based planning frameworks (with distributed modelling and scenario development capabilities) need to be assembled and multi-objective decisions made.
- Criteria, Guidelines - There exist no basin-wide technical criteria or guidelines for resource assessment and valuation to inform allocation decisions. This gap needs to be filled through basin wide hydro-environmental and socio-economic analyses.
- Indicators, Monitoring and Evaluation - there is no basin-wide system of hydro-environmental and socio-economic monitoring procedures that can be used to evaluate the impact of the a joint management plan. Key indicators and benchmark monitoring arrangements need to be agreed.
- Political agreement on and commitment to SAP implementation - the role of OKACOM in brokering political agreement and commitment needs to be strengthened through the inter-ministerial and cross-sectoral advisory mandate that it possesses. Here the role OKACOM can play in convening the technical dialogue between ministries, sectors and disciplines in all three countries will be pivotal.
- Sustainable Financing - The generation of financial resource flows for implementation of

the management plan has not been addressed. Specialist training in investment analysis and resource mobilisation is required to service stakeholder participation and donor consultations.

## II. PROJECT PURPOSE AND THE RATIONALE FOR GEF FINANCING - THE ALTERNATIVE COURSE OF ACTION

### Project Objective

23. The project objective is to alleviate imminent and long term threats to the linked land and water systems of the OR through the joint management of the ORB water resources and the protection of its linked aquatic ecosystems (comprising all wetlands, fluvial and lacustrine systems) and their biological diversity.

### Project Purpose

24. The purpose of the project is threefold. **First**, to overcome current policy, institutional, human resource and information barriers and constraints to co-ordination and joint management of the basin. **Second**, to complete a transboundary analysis to underpin a programme of joint management. **Third**, to facilitate the formulation of an implementable programme of joint management to address threats to the basin's linked land and water systems. A Strategic Action Programme (SAP) approach will be used as the programming instrument for the project. A two stage approach will be adopted, namely formulation of a Strategic Action Programme (SAP) to bring together all planning and management initiatives followed by SAP implementation. This project marks the first stage in this process. The SAP provides the vehicle in which to package the plan, overcome the barriers to regional co-operation and ensure that the sustainable development baseline can be met and global objectives achieved. The SAP will be designed to achieve the equivalent national development goals articulated in the baseline but will take national and regional activities into a new area - the alternative - where global benefits will accrue. The project will establish three fundamental outputs;

- strengthened mechanisms for the joint management of the ORB
- a completed transboundary analysis; and
- a formulated SAP.

This initiative will be driven by OKACOM in which the countries transboundary technical and policy analysis functions are invested and who will be responsible for co-ordinating formulation of the SAP and its subsequent implementation. OKACOM will also be strengthened through the review of its mandates, functions, competencies and resources, and its commitment to inter-ministerial and cross-sectoral co-ordination and collaboration.

### Rationale for GEF Financing

25. Eligibility for GEF Financing: As recipients of UNDP technical assistance, Angola, Botswana, and Namibia all meet the eligibility criteria set out under paragraph 9 (b) of the GEF Instrument. The project is eligible for GEF assistance under Operational Programme number 9: Integrated Land and Water/Multiple Focal Area, meeting the eligibility criteria by: [1] focussing on preventive measures to address threats rather than remedial, highly capital-intensive measures. [2] being nested firmly within the regional and international agreements on transboundary waters, [3], developing sound land and water resource management strategies through new policy initiatives and institutional arrangements [4] testing the use of the SAP concept to facilitate collaboration and leveraging of funding [5] financing the agreed incremental costs of measures to secure global benefits, providing for institutional and financial sustainability, [6] following guidance regarding public participation, [7] including a strong monitoring and evaluation component, that will document and widely disseminate lessons learned during the course of activity implementation, and 8] have clear links with GEF OP # 1 and 2. In addition, the GEF support will produce outcomes that address the short-term Operational Programme objectives of land degradation, a focus on Africa, SAP development, and participatory planning,

26. The objectives mark a significant response by the riparian countries to the 1995

Protocol on Shared Watercourse Systems in the SADC region and the Convention on the law of the non-navigational uses of international watercourses passed as a UN resolution in July 1997. They also echo the concerns of Chapters 18, 10 and 12 of Agenda 21 dealing with freshwater, land resources and fragile ecosystems respectively. An agreed SAP will provide a substantive background for additional GEF support to government actions in Botswana to safeguard the globally significant biodiversity of the wetlands of the Okavango Delta in accordance with the agreed broader programme of UNDP support to Botswana.

### **The project design and process**

27. The formulation of joint programme will be driven by a consultative process and enabled by policy, legal, institutional and financial commitments. When finalised through a series of consultative workshops, the TDA will provide an analysis of priority transboundary environmental problems, identify the scale and causes of degradation (proximate, intermediate and root), information gaps, policy distortions and institutional deficiencies. The SAP approach will be instrumental in defining and driving the necessary policy and financial commitments in the short to medium term. It is anticipated that the SAP will be formulated over a three year period after which substantial leveraged co-financing will be used to launch a longer period of SAP implementation followed by a continuous programme of joint management. The SAP will establish clear priorities that are endorsed at the highest levels of government and widely disseminated. Priority transboundary concerns will be identified, as well as sectoral interventions (including, policy changes, program development, regulatory reform, capacity-building investments) needed to resolve the transboundary problems as well as regional and national institutional mechanisms for implementing elements of the SAP. Co-ordination of priorities with those identified under the climate change and biodiversity focal areas will be undertaken during the SAP formulation. The countries and the GEF will agree on the baseline environmental commitments (which should be funded domestically or through donors or loans) and activities that are additional for solving the transboundary priority problems. A major donor conference will be held when the SAP is in the draft stage to facilitate international commitments to action.

## **III. PROJECT COMPONENTS, OUTPUTS AND ACTIVITIES AND EXPECTED RESULTS**

### **GEF PROJECT COMPONENTS AND OUTPUTS**

28. This proposal identifies specific groups of outputs and activities under each of the three major project components. Indicative budgets are based on proforma costs and the experience gained during the PDF work. The project outputs have been determined from consideration of the gaps identified in the draft TDA and guided by the principles for successful initiatives in river basin and wetland management. The specific activities under each output are detailed in the Logical Framework Matrix, Annex II. All activities under each output are time bound and sequenced. Many of the project activities are iterative while others are strictly phased. A Gantt chart is appended to the Logical framework in Annex II to clarify the timing of outputs within the 3 year project duration.

#### **COMPONENT A: STRENGTHENED MECHANISMS FOR JOINT MANAGEMENT OF THE ORB**

**Output A1.** *Expertise in the riparian countries strengthened to drive both inter-governmental and intra-governmental technical and policy initiatives in water resource planning and management for the ORB*

29. To initiate all outputs OKACOM will establish a small project executive office, a Project Management Unit (PMU), together with national counterparts in National Co-ordination Units (NCUs). These units will form the core of an **Okavango Initiative** to pull together a network of national and regional experts to produce the analytical work and then launch policy initiatives through consultative fora. The project will be aided by the high-level riparian country commitment invested in OKACOM and its mandate to advise on technical

and policy issues, and involve country resources that cut across ministerial mandates, sectoral interests, and technical and scientific disciplines. The PMU/NCU arrangement will exist for the life of the project only and will have transferred key expertise to national and regional institutions through training and education activities so that programme co-ordination can continue through the period of SAP implementation and beyond. A critical activity of the PMU at project inception will be to obtain an independent review of the mandate and capacity of OKACOM to make recommendations on appropriate changes in the OKACOM agreement and national enabling environments to better effect the implementation of joint management of the ORB. Activities of the PMU and NCUs will include: undertaking policy analysis; publishing and discussing results of analysis; formulating policy initiatives; identifying and servicing key training needs at all levels (institutions and communities); and designing investment vehicles for SAP implementation (ii & vi). Sub activities for the PMU will include: identifying regional and national capacity building needs and targets; and developing professional training at the regional level. Sub-activities for NCUs will include; developing and advocating national policy perspectives; and developing professional and community training at the national level.

**Output A2.** *Basin-wide mechanisms for stakeholder participation in basin management established and tested to ensure consensus, replicability and taking to scale*

30. The consultative process developed during PDF activities will be extended through consultative public meetings, reviews and seminars. SAP formulation will require broad-based collaboration with and participation of these basin stakeholders in association with related interest groups, donors, NGOs and research organisations to design realistic approaches to the management of land and water resources in the ORB. The PMU will establish and maintain a series of fora in each county to serve as principle sounding board for SAP formulation. Special emphasis will be given to activities in Angola where previous attempts during the PDF process were inhibited by political instability but where special consideration of displaced communities is required. In addition to the basin communities, the key institutional partners within government ministries and departments will be brought in to play a much more active role, a role facilitated by the presence of carefully selected NCU members. Clear participatory mechanisms for SAP formulation and later implementation will be established including an NGO sub-forum for NGO's to network, identify priorities and responsibilities, and share data and information. In addition broad public awareness in understanding the work to be undertaken in the SAP will be promoted through: a high intensity campaign in public awareness which will occur in the first months of the project; improving and extending World Wide Web access to the OKACOM website; and publishing and disseminating of TDA and SAP formulation information. Pilots and demonstrations for community participation (including mobilisation of funding) will be initiated in selected key communities within each country to test the replicability of basin management at local levels the scope for taking the initiatives to scale in the basin.

**Output A3** *Policy, legal, institutional and human resource initiatives launched and linked to national policy reviews to co-ordinate water resource management approaches across the basin*

31. Well structured institutional mechanisms are required to permit integration across natural resource issues at the national and regional levels. An important element here is ensuring that OKACOM becomes much more inclusive of environmental, agricultural, financial and planning agencies. Therefore the project's executive office, the Project Management Unit (PMU), together with national counterparts in the National Co-ordination Units (NCUs) will: establish natural resource planning linkages across national, inter-ministerial and socio-economic sectors and actors; specify natural resource linkages within national administrations/jurisdictions and NGOs associated with the basin boundaries; and link the basin initiative to regional planning and socio-economic development and initiatives and the activities of regional NGOs. This will allow OKACOM to: lock on to national and regional organisations responsible for natural resource management in the ORB; facilitate government buy-in and eventual commitment to implement; determine feedback in SAP formulation; and establish channels and participatory mechanisms for SAP implementation.

The results of the local level basin management pilots under A2 will be used to test the effectiveness of existing and alternative institutional links and structure appropriate SAP interventions. In particular, the international waters elements of the World Bank led Angola Water Sector Development project and the Namibian Water Resources Management Review (NWRMR) will be instrumental in defining Angolan and Namibian policy toward shared basins and will establish the enabling environment for subsequent investment under the SAP.

**Output A4** *Monitoring and Evaluation Procedures for SAP implementation*

32. The analytic work carried out in both component A and B will result in a set of key hydro-environmental, socio-economic and institutional criteria. These criteria will be used to develop a set of agreed indicators by which to verify compliance of a joint management plan and monitor and evaluate the impact of the SAP. Therefore institutional adaptation/sustainability indicators will be used to assess the extent to which the alternative has resulted in changes to national and regional institutions, particularly within the stakeholder institutions in the basin. In addition, the monitoring of key hydro-environmental indicators will have commenced as part of the project to measure the environmental impact of the SAP.

**COMPONENT B: COMPLETED TRANSBOUNDARY DIAGNOSTIC ANALYSIS**

**Output B1** *Water resource assessment and analysis completed to determine hydro-environmental processes, characteristics and limits*

33. A joint management programme will involve decisions about the allocation of water quantity and quality amongst the riparian countries and the basin's environment. The programme will also require basin-wide environmental indicators to be monitored to check compliance with and evaluate the impact of the SAP and the ensuing programme. While, the overall system boundaries and preliminary understanding of the ORB has been identified by the draft TDA work, the TDA can only be completed if hydrological and hydrogeological information can be analysed to the minimum degree of precision necessary to permit assessment of credible alternatives and joint management regimes. The current information on the dynamics of the basin water balance (quantity and quality) and consumptive and non-consumptive uses across the basin and projections for future water demands will be refined. Given the urgent need to establish this data for consultation and decision making, these water resource assessments will be given the highest priority in SAP formulation. The compilation of existing data and new data sets that are needed will be fast-tracked to bring to identify the minimum data sets to initiate the preparation of basin management models and subsequent negotiation and joint management. This compilation of water resource data will be done on the basis of priority and need concentrating on the glaring data gaps in Angola. Thereafter data will be selectively compiled on the basis of the most sensitive uses and the most credible water use scenarios so that a realistic range of water management scenarios can be modelled and options prepared by the end of the second year of the SAP formulation.

**Output B2** *Socio-economic analysis completed to establish current and future patterns of water resource use and levels of demand*

34. A socio-economic framework will be established in parallel with the physical analysis/framework developed in Output B1. This framework will be based on published reports and census data and targeted socio-economic assessments, particularly in Angola where particular attention will be given to the status of displaced communities and their specific engagement with the natural resources base of the ORB. Levels of consumptive and non-consumptive water use and levels of demand for the basin resources will be established and targeted social and economic assessments will be undertaken where no information exists. To enable appropriate economic analysis of all use and non-use values for the water resource base, the economic and social productivity of alternative uses of water across the basin and anticipated changes with time in productivity will be analysed.

**Output B3** *Water resource and socio-economic analysis super-imposed to define environmental*

*system limits and parameters*

35. The descriptions and analyses of the basin's linked environmental and socio-economic systems will be super-imposed using GIS techniques. The layering of basin frameworks will include; hydrological systems; hydrogeological sub-systems; ecological sub-systems; basin demographics and socio-economic status; and basin demands in water quantity and quality. This super-imposition and meshing of the resource base and the current demands will allow the identification of critical system limits and parameters for inclusion in subsequent modelling.

**Output B4** *Environmental assets of the ORB described and valued to structure models*

36. The existing environmental assets of the basin will be described in detail based largely on published material and the State of Environment Reports for Botswana and Namibia due for publication in early 1999. In the case of Angola, specialist environmental surveys and reports will need to be commissioned to complement the published material in Botswana and Namibia. These will include rapid surveys of the fluvial and wetland environments in the Cuito and Cubango sub-basins using remote sensing techniques and structured ground sampling. The use and non-use values of the environmental assets of the basin will be calculated on the basis of appropriate valuation methods.

**Output B5** *Comprehensive set water of resource alternatives for the ORB assessed to structure model scenarios and tested for replicability and taking to scale*

37. All the sources of freshwater and resource management opportunities for the region will need to be assessed to the extent that they offer alternatives to direct abstraction from the Okavango. These include existing groundwater sources in all three countries, optimisation of existing infrastructure, and non-structural solutions such as conjunctive use, national demand management programmes and tradeable abstraction and pollution permits. Each source and potential management solution will be detailed with sufficient precision to form a model component which can be considered as a potential alternative source or substitute for raw water abstraction or water quality tradeoffs. To assess the viability and replicability of alternatives, feasibility studies of enhanced recharge, small scale irrigation from groundwater, conjunctive use and small scale programmes in demand management will be carried out. In association with the World Bank, the PDF B has already initiated such studies in Namibia.

**Output B6** *Water resource development and management models used to produce water resource management options.*

38. As soon as sufficient data is assembled, by the end of the second year of the project, interactive modelling techniques will be used to explore regional water supply and water management alternatives and sensitivities and to demonstrate these to basin stakeholders. A detailed proposal for this work has already been submitted to OKACOM by the Natural Heritage Institute of Berkeley, California. A range of alternative development scenarios will be elaborated to assess the impact of future patterns of socio-economic demand and the ecological water requirements to maintain the functioning and productivity of wetlands in the basin and prevent wetland degradation. Opportunities for conjunctive use and alternative water resource options both within the basin and for centres of existing and potential demand outside the basin will be assessed in the models.

**Output B7** *Economic and environmental criteria produced to guide water resource allocation and development decisions*

39. Environmental and socio-economic criteria and guidelines will be produced by the end of the second year of the project to ensure that management actions and designs are consistent with the achievement of global environmental objectives. The guidelines and criteria will be pivotal in driving policy and institutional changes at the regional, national and local levels. These will include clear recommendations on natural resource valuation, rights in water use and associated natural resource use, allocation, levels of irrigation

efficiency, demand management for urban water and tariff structures for water services. In addition, a comparative analysis of existing legal and regulatory provisions will be made and evaluated as a basis for joint management under the SAP and appropriate recommendations made for national review.

### COMPONENT C: SAP FORMULATION

#### **Output C1** *Technical and policy implications of joint management options evaluated*

40. The implications of adopting the various options will be evaluated by the riparian countries in a series of OBSC and OKACOM meetings in which the PMU will present the results of the TDA. The degree to which the various options meet the economic and environmental criteria will be assessed and the options ranked accordingly. This evaluation will occur within the context of the SAP as it is developed over the duration of the project.

#### **Output C2** *Joint integrated management programme negotiated and designed*

41. As soon as the management options have been evaluated, a joint integrated management programme (JIMP) for the basin will be drafted and negotiated. Compared with the originally "integrated management plan" proposed by OKACOM, this will be a considerably enhanced programme for integrated management. It will have direct links with ongoing water sector management activities carried out by the World Bank and UNDP in Angola and Namibia. It will therefore substitute the baseline activity and extend the scope and vision of the originally proposed integrated management plan by taking into account a much deeper economic analysis of the transboundary benefits linked to the ORB. It will be achieved through the inclusion of stakeholder consultation, the integration of hydrological process, natural resource management and socio-economic activities.

#### **Output C3** *Commitments to SAP Implementation defined including, policy, legal, institutional, human resource arrangements*

42. Authority has been invested in OKACOM by the cabinets of the riparian governments to advise on all policy, technical and investment matters related to the ORB. The precise policy, enabling environment and resource commitments from each country will be defined in inter-ministerial and multi-disciplinary consultations hosted by OKACOM from project inception. This will allow government commitment to the SAP to be incorporated into national development plans and give a clear signal to basin stakeholders and SAP partners. These policy and resource commitments will form the basis of the support to SAP implementation and will have been built over the whole period of SAP formulation.

#### **Output C4** *SAP document produced and endorsed by riparian governments through integration of outputs C1- C3 in collaborative process with basin stakeholders and SAP partners*

43. A draft SAP will be produced in the first year of the project on the basis of preliminary findings from ongoing project activities. The technical and policy commitments given by the riparian countries will form the basis of a rolling SAP document into which basin stakeholders and SAP partners will be invited to contribute on the basis of their respective comparative advantage. The SAP will include expected and additional priority actions to address the priority transboundary issues and will comprise policy, legal, institutional and investment decisions at national and regional level. The final draft of the SAP will be presented to governments for their endorsement in the third year of the project prior to presentation at donor conferences.

#### **Output C5** *SAP finance mobilised in preparation for implementation*

44. SAP investments will be integrated into national development plans. Significant project resources will be used to assure the preparation of all necessary documentation, meetings and conferences to mobilise financial support for the SAP. The World Bank is expected to play a lead role in co-ordinating and organising donor support for the SAP since it is currently assisting Angola and Namibia in setting the policy frameworks for water related investments and will be preparing national investment programmes during the project period. In addition, current World Bank activities in Angola and Namibia have direct links with the project outputs and have been leveraged by the GEF PDF activities. It is anticipated that the bulk of financing for SAP implementation will come from non-GEF sources. It is therefore important to develop an adaptable and flexible arrangement with development partners – governments, donors, NGO's and basin stakeholders who will provide financial, technical, and human resources for implementation. The design of investment vehicles and the production of prospectus material to match investment opportunities with investors will be essential, as will the training of Government personnel in this field material and training will be developed and provided to ensure the Okavango initiative can leverage sufficient funding to realise both an enhanced domestic baseline and global benefits. Donor consultation will occur at an early stage in the project so that buy-in to the SAP is assured by the end of the second year of the project in readiness for formal donor conferences in the final year of the project.

#### INDICATORS TO MEASURE IMPLEMENTATION OF PROJECT COMPONENTS

45. Specific indicators to measure the implementation of project components are derived from project reporting requirements, completion of scheduled meetings and consultations and are detailed in the Logical Framework Matrix (Annex II). These are distinct from the implementation indicators for the programme of joint management.

#### END OF PROJECT SITUATION

46. End of Project Situation. Key institutional barriers to integrated joint management will have been overcome. Broad awareness about the state of the basin will have been raised at the national, regional and international levels. This will draw attention of decision makers to the critical planning needs and guarantee political and financial support for SAP implementation. OKACOM will have been strengthened as both a political forum for involving key high level government officials to negotiate the sharing of transboundary water and as an initiator of policy shifts at national and regional level. Specifically there will be in place; mechanisms for consultation, communication, and participation in all three riparian countries; an updateable knowledge base; policy initiatives launched and cross sectoral integration mechanisms established; a joint programme for management of the basin; natural resource management capacity built at regional and national level; and finance mobilised for SAP implementation and beyond. The project will have demonstrated new collaborative approaches to transboundary water management that are based on open understanding and consensus while also fulfilling the countries' stated desires to understand and protect the basin in order to meet a potentially divergent range of national interests including disparate levels of socio-economic development, nature conservation, and eco-tourism. Explicit links between this International Waters project and the GEF's biodiversity focal area are anticipated and will be articulated in the SAP. This is particularly the case in Botswana where natural resource conservation activities will be promoted on the basis of the water resource management analysis carried out in the project.

47. Project Beneficiaries. The protection of a key freshwater body with extremely high instrumental value will yield a range of benefits at both the global and national levels— according direct, indirect use, option, and existence values. The global community will benefit from the protection of a unique hydrological system and its related aquatic ecosystems, that would otherwise be threatened, and for which no equivalents exist. At the national and local levels, the project would maintain the option for basin communities to use the freshwater base and associated biological diversity for consumptive and productive purposes. Other beneficiaries include communities, government personnel and staff from local NGOs working in the project sites who would benefit from additional training and exposure to innovative basin management and conservation approaches.

## IV. RISKS AND SUSTAINABILITY

### **RISKS.**

48. The long-term success of this initiative depends primarily on the political willingness of the riparian countries to co-operate not only on regional transboundary issues, but also to collaborate positively across the linked sectors within their national administrations and socio-economic systems. The success of OKACOM as the co-ordinating agency is the key to maintaining the initiative and any undermining of OKACOM's position as the prime technical adviser to all three governments on the ORB will pose a serious risk to SAP implementation. This political will is necessary to the creation of specific institutional arrangements and strategies that are consistent with the SAP process. An ongoing concern is the ability of OKACOM and related institutions in the riparian countries to implement progressive natural resource policy. While OKACOM has a mandate as an inclusive body, sectoral interests may crowd out key partners across environmental, agricultural, financial and planning departments and agencies. To prevent this from occurring, the consultation and communication components have been designed to address this risk from the inception of the project.

49. The current uncertainty over peace in Angola and the Democratic Republic of Congo poses risks to project implementation if unrest in the region spills over into the ORB. In particular, if access to the catchments and the risks of land-mines inhibit direct data collection more emphasis will be placed on remote sensing and detailed interpretation of multi-temporal imagery. While a period of unrest may disrupt consultations, water will remain a key issue for any government. In the case of major unrest which threatens project implementation, UNDP will suspend operations in accordance with standard UNDP rules and procedures. The risk of international water disputes through lack of communication and understanding over water as the ORB is progressively re-settled and developed in Angola is minimised by the effective dialogue that takes place within OKACOM. Generally there is strong interest in co-operation and co-ordination among the three countries, particularly since all countries belong to SADC and OKACOM and can be expected to respect the SADC Protocol on Shared Water Resources.

50. Time is of the essence in this initiative. SAP formulation needs to proceed as quickly as possible to establish a meaningful framework for riparian co-operation and avoid unilateral action on the basis of drought conditions or other national imperatives such as dealing with the emergency re-settlement of refugees in the ORB. Prevention on this basis will be much cheaper than cure and needs to occur while close co-operation amongst the riparians can be assured.

### **SUSTAINABILITY**

51. Government Commitment. The governments of the three countries of the Okavango have already demonstrated strong commitment to strengthening international co-operation in the regional basin management and this commitment has been confirmed among other things by their readiness to appoint OBSC as the co-ordinator of the PDF work on the TDA. The draft TDA further illustrates the governments' commitment to the development of enhanced transboundary environmental co-operation under the GEF International Waters Operational Strategy. This project brief has incorporated the comments and suggestions from the governments, scientific institutions, NGO's, and other donors and UN system agencies, gathered in several regional consultative meetings, and has received the official endorsement of all participating countries and OKACOM (Annex IX).

52. Economic Sustainability. The project is designed to identify all use and non-use values of the ORB within the national and regional economic frameworks. This will establish the economic rationale for investing in integrated management of the ORB, conserving the stock of environmental assets, and optimising the flow of benefits from the basin's natural resource base. Positive and negative externalities associated with a set of

water resource development options in the ORB will be evaluated and policy initiatives put in place to minimise transaction costs and work toward internalisation of negative externalities

53. Institutional Sustainability. The project is designed specifically to mainstream hydro-environmental and ecological concerns for the ORB within processes of decision making occurring within communities, local government, interest groups and NGOs operating within the basin - the stewards of the basin's landscapes. It will do this in two ways. First by driving policy changes and institutional adaptation at national levels and second, by active engagement of the basin stewards in research, analysis, and monitoring of programme components. Schools, colleges, universities, and research institutions will be key partners in building this capacity. In addition, the penetration of these sustainability concerns into national policies, regulatory, and institutional frameworks will be driven by the engagement of national professional interest groups in carrying out awareness raising, research, analysis, and monitoring. OKACOM will promote this penetration by use of their communication and networking capabilities, a feature of the PDF work that had positive resonance within the basin communities.

54. Financial Sustainability. The promotion of the SAP and solicitation of government, investor, and donor resources by OKACOM and the IAs will provide supplementary funding for SAP formulation and implementation. Overheads of the operational units at regional and national level will be kept low - they will rely on networking of dedicated professionals and interest groups rather than a permanent basin secretariat - and will present attractive donor opportunities. Investment opportunities will be identified and prepared during SAP formulation with the World Bank taking a lead role in co-ordinating and organising key donor conferences and stimulating national investment. The SAP and subsequent joint management initiatives will be designed to be self-financing. Specifically, under output C3 the project will ensure that the financing mechanisms established for the SAP will continue beyond the life of SAP implementation through the incorporation of SAP components in national development plans and external assistance projects.

## **V. STAKEHOLDER PARTICIPATION AND IMPLEMENTATION ARRANGEMENTS**

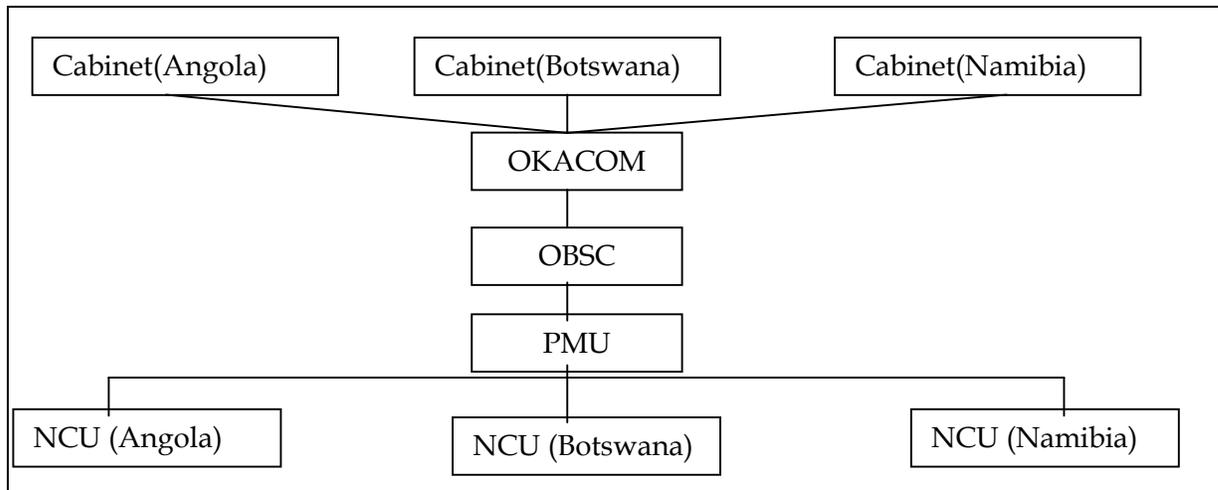
### **STAKEHOLDER COMMITMENT AND PARTICIPATION**

55. Environmental issues are a high societal priority in the region. Many public organisations as well as individual scientific and research institutions and consultants have invested their resources in understanding and analysing the Okavango basin. The project will involve these various stakeholders in project monitoring, evaluation, and implementation through numerous consultations and workshops and improved Internet access among stakeholders. Many of these stakeholders will have an important role to play in implementation.

56. Recent project proposals for developments in both Namibia and Botswana have highlighted the need for the most complete public/stakeholder consultation and participation possible. The consultation process set up during the PDF work has provided a clear message, that education, participation and consultation can go hand in hand. Both community members and leaders expressed the opinion that they would not be able to participate in the consultative process if they did not have a good grasp of all the issues. Schools, colleges, research institutions, and ngos in the basin have expressed a high degree of interest in an Okavango initiative and the project makes provision for a serious education, training, and information effort to be included. A summary of the proposed public involvement plan is presented in Annex VIII.

### **PROJECT IMPLEMENTATION AND INSTITUTIONAL FRAMEWORK**

57. Institutional Framework. The institutional framework for the project is set out below. OKACOM derives its authority from the respective cabinets of the riparian countries. The Governments of Angola, Botswana, and Namibia have nominated national experts as country delegates to OKACOM. These delegates are drawn from the respective Departments/Directorates for Water Affairs, Ministries of Environment, Planning, and Attorney General's Offices. OBSC is responsible for overseeing the day to day implementation of studies related to the ORB.



58. Project Implementation. Figure 2 of Annexe V illustrates the project implementation arrangements. The Project Steering Committee (PSC), comprising OKACOM and the involved GEF IAs, has overall responsibility for the project and will provide policy, management and financial guidance. The PSC will meet annually and is expected to delegate tasks and resources to the respective implementing agencies where their comparative advantage is greatest. UNDP is the lead implementing agency and will support national and regional co-ordination of project activities. The World Bank will take the lead in identifying and promoting investment opportunities related to the SAP. UNEP will provide technical backstopping to the TDA work, particularly in areas of environmental assessment and analysis. The Project Management Committee (PMC) will comprise OBSC, the PMU, the NCUs, ministerial representatives involved in the management of the ORB together with involved NGOs, research institutions and civil groups. The PMC will provide active project supervision and co-ordination and will be instrumental in feeding back policy initiatives and identifying investment opportunities in the SAP. PMC meetings will occur regularly and will rotate through all three countries. National components will be executed through national execution modalities with the support of UNDP country offices in co-operation with Water Management Branch of the United Nations Secretariat (UN DESA). OKACOM will continue in its role as the inter-governmental mechanism for co-ordination, delegating specific tasks to OBSC and linking high-level policy and decision makers from the three Okavango basin countries.

59. The Project Management Unit (PMU) will be appointed by OKACOM and will work under the guidance of OBSC to oversee day to day implementation of project activities and play the primary role in ensuring co-ordination of the project with other relevant activities in the region. A core team comprising a programme manager and national programme coordinators will form the project executive office and will be responsible for the detailed formulation of the SAP bringing in key specialist services at the regional level as required. The composition of this core team will draw the best possible expertise from the riparian countries in water resources; natural resource management; environmental specialists (with emphasis on wetlands); and social and community development. Specific line ministry co-ordination and multi-disciplinary collaboration, including national NGOs will be undertaken at country level by the National Co-ordination Units (NCUs), the functional equivalents of inter-ministerial committees. The national executing agencies under UNDP co-operation agreements will be; the Ministry of Energy and Water in Angola; the Ministry of Mines,

Energy and Water Affairs in Botswana; and the Ministry of Water and Rural Development in Namibia.

60. Funding will be established and administered jointly by the PMU and the NCUs. All project funds, including those of GEF, will be listed together with their respective conditionalities and financial reporting requirements. Each component of the funding will be subject to individual reporting requirements but will be matched with SAP activities to provide a transparent map of current programme expenditure flows.

## **VI. INCREMENTAL COSTS AND PROJECT FINANCING**

61. Incremental Costs. Total incremental costs are calculated at US\$7,170,500 of which the GEF contribution is US\$4,745,500 and co-financing is US\$2,425,000, based on government contributions, anticipated Implementing Agency inputs and expressions of interest received from NGOs and bilateral donors. The incremental costs attached to this GEF project are linked principally to overcoming barriers to joint management of the basin, completion of a TDA and the subsequent development and negotiation of the SAP. Overcoming these barriers has specific capacity building implications and associated costs that lie beyond the domestic baselines of the riparian countries. Annex 1 presents a summary of the domestic and global benefits and costs together with a matrix of individual country baseline and alternative costs associated with each project objective.

62. Project Financing. The financing of the project within the context of the SAP will be ensured by the commitment of all three governments and bi-lateral and multilateral donors who have expressed an interest in supporting OKACOM and the SAP process. The summary of costs presented in Table 1 are indicative and are based on 1998 proforma costs and the experience gained in executing the TDA studies during the PDF phase. Access to the Angolan portion of the basin is limited by landmines and made difficult by the remoteness of the area. In addition, operating costs in Angola are much higher than in either Botswana or Namibia. The detailed breakdown of sub-activities, their justification, terms of reference and associated budgets will be presented in the project documents.

**Table 1. Summary GEF Project Financing (US\$)**

<b>Project Components/Outputs</b>	<b>TOTAL</b>	<b>Co-financing</b>	<b>GEF</b>
<b>Component A: Joint Management</b>			
<b>Output A1:</b> Expertise	1,234,900	525,000	709,900
<b>Output A2:</b> Stakeholder Participation	1,050,600	200,000	850,600
<b>Output A3:</b> Policy initiatives	147,000	100,000	47,000
<b>Output A4:</b> Monitoring and Evaluation	165,000	0	165,000
<b>Total: A.</b>	<b>2,597,500</b>	<b>825,000</b>	<b>1,772,500</b>
<b>Component B: Completed TDA</b>			
<b>Output B1:</b> Water resource analysis	1,951,000	1,400,000	551,000
<b>Output B2:</b> Socio-economic analysis	730,000	200,000	530,000
<b>Output B3:</b> Super-imposed frameworks	96,000	0	96,000
<b>Output B4:</b> Environmental assets	120,000	0	120,000
<b>Output B5:</b> Alternatives	360,000	0	360,000
<b>Output B6:</b> Water management models	130,000	0	130,000
<b>Output B7:</b> Criteria	92,000	0	92,000
<b>Total B.</b>	<b>3,479,000</b>	<b>1,600,000</b>	<b>1,879,000</b>
<b>Component C: SAP Formulation</b>			
<b>Output C1:</b> Technical & policy implications of options	114,000	0	114,000
<b>Output C2:</b> Joint IMP negotiated	425,000	0	425,000
<b>Output C3:</b> Commitments defined	140,000	0	140,000
<b>Output C4:</b> SAP document produced	250,000	0	250,000
<b>Output C5:</b> SAP finance mobilised	165,000	0	165,000
<b>Total C.</b>	<b>1,094,000</b>	<b>0</b>	<b>1,094,000</b>
<b>TOTALS</b>	<b>7,170,500</b>	<b>2,425,000</b>	<b>4,745,500</b>
Project Support Services	380,000		380,000
PDF (Block A and B)	374,000		374,000
<b>Total Project Financing</b>	<b>7,924,500</b>	<b>2,425,000</b>	<b>5,499,500</b>

## **VII. MONITORING, EVALUATION AND LESSONS LEARNED**

63. Monitoring and evaluation Project objectives, outputs and emerging issues will be regularly reviewed and evaluated at annual meetings of the PSC and the PMC. The project will be subject to the various evaluation and review mechanisms of UNDP, including Annual Programme Review (APR), Tri-partite Review (TPR) and an external Evaluation and Final Report prior to the termination of the project. The project will also participate in the annual Project Implementation Review (PIR) exercise of the GEF.

64. Working in concert with appropriate scientific and technical institutions and government agencies in the region, in line with emerging GEF policies the project will develop a set of 'indicators' to track the short and long-term impacts of this and other related projects in the ORB. Key indicators will include process (e.g. policy, legal, institutional, etc. reforms), stress reduction (e.g. reduced pollutant loads or per capita water demands, etc.), and environmental status (e.g. cleaner waters, restored habitats, etc.).

65. Lessons learned and technical reviews. The development of this project has benefited substantially from a detailed review of previous environmental studies carried out in Botswana and Namibia. This includes approaches to community and NGO involvement, public awareness and consultation activities and the TDA process, and from the direct involvement of local specialists active in basin research. The STAP technical review has strengthened the economic rationale for the project by pointing to allocation issues and the need to evaluate tradeoffs at an early stage in the development of the SAP. This consideration will refine the types of data and resulting scenario analyses that are carried out. In addition, the project will be involved from the start in the new GEF IW LEARN (Learning Exchange and Resource Network) programme.

## Annexes

Annex I:	Incremental Cost Matrix.
Annex II:	Logical Framework Matrix
Annex III:	STAP Roster Technical review

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### List of Optional Annexes

The annexes listed below are not required as part of the standardised GEF project brief. However, they are available on file for reviewers seeking additional background information.

**Annexe IV:** Contains the map of the Okavango River Basin, the topographic limit of the basin and the principle towns and international boundaries.

**Annex V:** Contains Figures 1 (Strategic Approach to Project Design) and 2 (Project Implementation Arrangements) referred to in the Brief text.

**Annex VI:** Provides a Table of Contents and a Summary of the draft Transboundary Diagnostic Analysis together with the table of contents of the two part report.

**Annex VII:** Provides a listing of the national expert group and the titles of their respective specialist reports.

**Annex VIII:** Provides a summary of the public involvement plan for the project.

**Annex IX:** Contains copies of GEF Operational Focal Point endorsement letters.

**Annex X:** OKACOM Agreement

## Annex I: Incremental Cost Analysis

### 1. Regional Context and Broad Development Goals

1.1 The region has given a high priority to both water resource development and environmental concerns. UNDP and the World Bank are already funding water resource management reviews in Angola and Namibia. All three countries are participating in a SADC water roundtable initiative. Both Namibia and Botswana have committed funds to environmental assessments of the basin in so far as national priorities have been addressed.

1.2 The socio-economic pressures on the region's limited water resource base have driven high levels of investment in water infrastructure, particularly in Botswana and Namibia. Over the past ten years, these water development initiatives have been increasingly subject to economic and environmental scrutiny both from domestic interest groups and international institutions.

### 2. Global Environmental Objective:

2.1 The Okavango River Basin has unique qualities in terms of its geomorphology, hydrology, and biodiversity, qualities which remain relatively pristine with little discernible human impact on the hydrology and aquatic ecology of the basin. The significance of the basin has been highlighted by the international interest in the hydro-ecological state of the Delta and the bio-diversity it supports. In addition, by virtue of its remoteness and the continuing political instability, the Angolan portion of the basin remains one of the least developed regions in the savannah belt that traverses Angola, the Republic of Congo and Zambia. The complex arrangement of linear tributaries, dambos and broad seepage zones in the upper and middle Cuito and Cubango sub-basins make road access difficult and it is probable that this relatively undisturbed environment exhibits largely unmodified hydrological responses. The incipient degradation under the baseline conditions will threaten aquatic flora and their associate fauna both in the source sub-basins in Angola and the Delta in Botswana.

2.2 If left unchecked, the direct and indirect threats to this international water body will result in the breakdown of the hydrological and ecological integrity causing the global community to forfeit sizeable conservation benefits (including direct and indirect use values, and existence and option values). The threats are real and imminent - as evidenced by the recent unilateral initiative by Namibia to abstract water from the system under emergency drought conditions. This was avoided following a period of rainfall that re-established reservoir levels in the central area of the country. It is expected that the opportunity to protect this relatively pristine system will not appear again and that the costs of remedial action will exceed current conservation costs by several orders of magnitude.

### 3. Baseline

3.1 The scope of the baseline is set spatially by the natural limits of the ORB and the locus of external demands upon the basin's resources, thematically by the project objectives (joint management, water resource analysis and planning/programming), and temporally by the life of the project (3 years). The sectoral activities in the basin that involve direct water abstraction and disposal from and to the Okavango watercourses are distinguished from activities that relate to mechanisms for joint management, water resource analysis for the ORB, and the programming and planning of water related investments in the ORB. A proportion of these non-operational activities carried out by each country will be diverted into the alternative.

i. **Operational Water Service Management:** In this analysis, this is taken to comprise all water supply, sanitation, irrigation and watershed management activities that occur in the basin. These are established in published national development agenda and where information is not available on the planned investments made in the basin, estimates have been based on the basis of population distributions. Current levels of inward investment and domestic productivity in the **Angolan** portion of the basin cannot be assessed with any

degree of accuracy at the moment since access to the Cuando Cubango Province is limited and the legacy of the recent civil war inhibits provincial development. Since independence, there has been no appreciable inward investment to the basin. Prior to independence in 1975, small scale irrigation activity was largely privately managed and only two small scale hydro-electric schemes in Menonge and Cuvango were put into operation. Following 22 years of war and some 5 years of recent drought, the Province has been de-populated. Under a recent provincial planning exercise for a re-habilitation programme, the overall budget for Cuando Cubango Province is US\$ 27,170,062 based on 1995 prices. A sectoral breakdown apportions agriculture 31%, rural trade 17%, roads 15% and education 11%, which represents 74% of the total programme. In 1997 World Bank has also proposed a US\$40,000,000 Agricultural Sector Investment Programme to assist smallholder and commercial farmers through improvements in government services, an improved policy framework and the provision of funds for rural infrastructure. The World Bank are currently preparing a national water sector development project for the period 1999-2001. It is anticipated that this will focus on priority areas in the north and west of the country. The development plans for Cuando Cubango Province are being formulated, but given the small population of the basin, a small level of investment in water services, water supply and sanitation and small scale irrigation is anticipated. In **Botswana**, development priorities for the Okavango Delta region are aimed at a disparate range of development programmes, nature conservation and eco-tourism. It is important to note that tourism currently accounts for 3% of GDP in Botswana as a whole, but the relative contribution from tourism related services for the Okavango Delta is much higher. The Government of Botswana is committed to the implementation of the 8<sup>th</sup> National Development Plan for the period 1997/8-2002/3 which anticipates a Major Village Water/Sanitation Development project costed at \$US 9,000,000. In **Namibia** a policy of devolving planning and budgetary functions to regional authorities has been initiated. A recent World Bank poverty alleviation study has recommended the Okavango freshwater resources be utilised for small scale irrigation. The First National Development Plan specifies ongoing work in rural water supply and sanitation for the period 1996-2000. Bulk water transfer investments are costed at \$10,000,000. Provision for feasibility studies for the construction of an emergency pipeline to the Okavango has been set at approximately US\$2,000,000. The preliminary feasibility work carried out in 1997 amounted to approximately \$US 1,500,00. Upgrading of Rundu town water scheme over the project period approximately US\$3,500,00.

**ii. Mechanisms for Joint Management:** The national resources devoted to joint management of the ORB are extremely limited, comprising government staff time dedicated to servicing OKACOM meetings. In the absence of GEF support, the level of expenditure on joint management is anticipated to remain at this level which would amount to no more than \$100,000 over the life of the project. The PDF A and B contributions have amounted to \$374,000 over the past three years. However, of significance is the fact that since 1997, all three countries are participating in the SADC water roundtable process supported by UNDP. Direct support from UNDP for all three countries is estimated at US\$200,000. National activities in policy development are variable. In **Angola**, the World Bank will be focussing on water policy and institutional development (~US\$1,400,000) and transboundary water resources (~US\$460,000). The support may also include a pilot study for the Cunene basin (~US\$2,400,000) which is also shared with Namibia. However, since the Cubango is not a priority basin for the country, it is not anticipated that any of these resources will be dedicated to the ORB. In its 8<sup>th</sup> National Development Plan **Botswana** has budgeted for International Water Planning and Development of which some 30% (~US\$ 130,000) is earmarked for the Okavango basin). **Namibia** is undertaking a more substantive policy and institutional review of its water sector in the light of its recent policy directive on decentralisation and a need to address increasing demands for water services. A World Bank/GTZ/UNDP supported Water Resources Management Review amounting to \$US 1,100,000 was launched in early 1998. Approximately \$250,000 of this will address transboundary river basins where Namibia is forced to negotiate with neighbours. It is anticipated that some \$75,000 of this budget will be directly related to transboundary issues for the Okavango

**iii. Basin Analysis.** Interventions in integrated natural resource analysis within the basin and within the riparian countries are limited. Most interventions are of a sectoral nature and relate to water supply and sanitation, agriculture, and tourism. In **Angola** the World

Bank and the Norwegian Government are co-operating on a set of national water resource management proposals in areas where the respective comparative advantage is greatest. Norwegian assistance is estimated at US\$2,000,000 and is committed to the upgrading of key hydrometric installations in northern and coastal provinces and undertaking a national water resources assessment. It is anticipated that the thrust of this work will concentrate on areas other than the Cubango and Cuito sub-basins. In **Botswana** the 8<sup>th</sup> National Development Plan includes; Hydrological Support including updating of the Okavango forecasting model (~\$US 182,000); and Groundwater Studies and Protection (~ \$US 200,000). The University of Botswana has obtained private sector support for a research station in the Okavango Delta estimated at \$US 500,000 over the life of the project. Other relevant activities include a Finnish Government assisted State of the Environment Report on Water in Botswana (\$95,000) and research on demand management assisted by IUCN (\$25,000). In Namibia, relevant activities include a Finnish Government assisted State of the Environment Report on Water in Namibia (\$95,000) and research on demand management assisted by IUCN (\$25,000). The Directorate of Environmental Affairs are also carrying out a review of pollution control and waste management legislation and research into natural resource accounting. Future work of the Department of Water Affairs will include the compilation of a national hydrogeological map and the consolidation of a groundwater database. This work may be expected to complement the ongoing work in the Department of Agriculture in the use of satellite imagery to monitor national agricultural and rangeland conditions.

**iv. Programmatic formulation and finance.** In the baseline, there is no provision for the formulation and programming of resources to address joint management. These activities will only occur in the alternative once the transboundary diagnostic is completed.

#### 4. GEF Alternative

4.1 Without adoption of the GEF alternative, the riparian countries' ability to develop a joint management plan for the ORB will be limited. The Alternative will promote radically new approaches to natural resource management in the ORB. These will be based upon thorough consultation, analysis and cross-sectoral policy and programmatic integration. The following interventions are proposed;

**i. Operational Water Service Management:** In the alternative, baseline activities in water service operations will continue according to national development plans.

**ii. Strengthened Mechanisms for Implementation of Joint Management:** Current institutional arrangements at the national and regional levels cannot adequately address transboundary management of the ORB. GEF funds will be used to identify and enhance existing mechanisms and develop new mechanisms for integrating natural resource planning across sectors and jurisdictions throughout the ORB. Strategic alliances with key partner government agencies, communities, NGOs, and the private sector will be sought and sustained during SAP development so that SAP implementation can proceed unimpeded by bottlenecks that would otherwise occur, particularly with newly established institutional arrangements at local levels. The Project Management Unit and the respective National Co-ordination Units will be instrumental in driving the necessary policy and institutional initiatives to implement the SAP. **Awareness Raising, Consultation and Communication** is necessary to enlist broad support for an Okavango River Basin initiative and GEF funding will be used to ensure that the PMU can produce and broadcast TDA and SAP information extensively in the ORB region and internationally. In addition GEF funding will be used to enhance the relatively under-resourced stakeholder fora in the ORB region. National and district level fora will be established by the PMU through the NCU in each riparian country. **Training** will be an important function of the PMU which needs to service specific training needs in progressive natural resource management and basin planning at regional and national levels. Without this pro-active approach to the training of artisans, technicians, community animators and environmental and socio-economic professionals in the region, the desired policy responses and institutional innovations will not be implementable. Provision is also made for the development of skills and leveraging of finance to implement the SAP.

**iii. Completed Transboundary Diagnostic Analysis.** GEF funding will be used here to specifically fill critical natural resource information gaps and bring the refined knowledge of the hydro-environmental socio-economic systems onto a platform where transboundary externalities can be examined and resolved. This is not possible under current baseline where national interests determine research and analysis activities and where basin-wide information does not exist or is not accessible. The knowledge embedded in the finalised TDA will underpin the design of the SAP and substantively service the monitoring and reporting needs during SAP implementation. Most importantly, the process of completing the TDA will inform policies and initiatives to be launched in preparation for SAP implementation.

**iv. Strategic Action Programme Formulation.** The design of the SAP together with the specification of the necessary institutional and financial arrangements will involve a long period of careful negotiation between the riparian countries and development partners. This process is not addressed in the baseline where national planning priorities are addressed.

## 5. Scope of Analysis

5.1 The system boundary of the project is defined in two ways. First, by the hydrologically active portions of the ORB in Angola, Botswana and Namibia where intra-basin demands for water and associated natural resources are centred. Second, by specific links to centres of demand for water outside the basin. The topographic boundary of the basin is crucial in Angola, but is less relevant in terms of transboundary water resources in Botswana and Namibia

5.2 The thematic limits for this analysis are set by the project objectives to prepare for the implementation of a programme of joint management through strengthened institutional mechanisms, transboundary analysis and SAP formulation. Requisite institutional strengthening across the related sectors is of the essence. The design of the proposed project has taken into full consideration its complementarity with other existing projects in the region, particularly the World Bank and UNDP funded water reviews in Angola and Namibia.

5.3 The temporal boundaries for this analysis are set by the anticipated period of preparation for implementation and SAP formulation, a three year period. The project benefits will clearly continue to accrue beyond this time boundary of both the first stage defined by the project and the second stage of SAP implementation

5.4 Sunk costs, incurred prior to 1998 have been omitted from the analysis. The baseline captures investments within the ORB and specific elements associated with extra-basin demands for water. The Alternative captures the additional actions required to secure project objectives within the system boundary. There will be substantial leveraging of domestic baseline costs that address joint management and basin analysis towards the globally preferred alternative.

## 6. Costs and the Incremental Cost Matrix:

6.1 Baseline expenditures amount to US\$31,050,000; the Alternative has been costed at US\$38,220,500. The GEF would provide US\$ 4,745,500 in incremental cost financing, approximately 13% of the total cost of implementing the Alternative<sup>1</sup>. This funding is targeted specifically at over-coming barriers by defraying the transaction costs associated the joint management of transboundary waters. Co-financing has been secured from the riparian governments, UNDP and the World Bank for institutional strengthening aspects and firm expressions of support to the SAP process have been given by national and international NGOs and bilateral donors. Total co-financing amounts to US\$2,425,000..

6.2 In the longer term, removal of barriers to sustainable use will widen the menu of

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<sup>1</sup> This sum is in addition to the US\$ 374,000 allocated in PDF A and B funding.

development options available at a local level. But in the short term, the generation of the SAP will result in mainly non-pecuniary benefits. For the riparian countries, tangible costs exceed tangible benefits in the intermediate term, providing little incentive to undertake this initiative without external assistance.

### Incremental Cost Assessment: SAP Development for the Okavango River Basin

Costs/Benefit	Baseline (B)	Alternative (A)	Increment (A-B)
<b><u>Domestic Benefits</u></b>	<ol style="list-style-type: none"> <li>1. Basin degradation accelerates as socio-economic demands increase pressure on land and water resources in the respective districts linked to the ORB.</li> <li>2. Sectoral competition for water increases and locally sustainable development opportunities through natural resource management lost</li> <li>3. Limited scope for public involvement in environmental management of the river system. Basin stakeholders poorly engaged with environmental concerns at local and district/provincial level</li> <li>4. National data collection , processing, and analysis limited to surface water resource information only</li> <li>5. National capacities to effect integrated land and water body management measures limited.</li> </ol>	<ol style="list-style-type: none"> <li>1. Basin degradation attenuated</li> <li>2. Sectoral competition ameliorated</li> <li>3. Consultation and participation mechanisms for engendering public participation in environmental planning and management expanded and better informed.</li> <li>4. Basin frameworks</li> <li>5. Institutional and human capacity strengthened in the arena of integrated land and water body management</li> </ol>	<ol style="list-style-type: none"> <li>1. Transboundary externalities removed</li> <li>2. Sectoral activities co-ordinated and optimised</li> <li>3. Basin stakeholders more responsive to environmental protection measures</li> <li>4. Completion of national analysis</li> <li>5. Strengthened national capacities in international basin negotiation</li> </ol>
<b><u>Global/Regional Benefit</u></b>	<ol style="list-style-type: none"> <li>1. Globally significant river basin experiences degradation in water quantity, quality and sediment regime along its length, leading to loss of aquatic habitats and associated biodiversity.</li> <li>2. International competition for water exacerbated. Sustainable development opportunities for the basin as a whole foregone</li> <li>3. No basin-wide forum for discussion and consultation Lack of awareness about transboundary issues</li> <li>4. Lack of regional communication and co-ordination among and between Okavango River basin stakeholders/civil society and limited opportunities to develop negotiation skills</li> <li>5. International negotiation limited by infrequent technical meetings and lack of detailed hydro-environmental information for basin as a whole.</li> <li>6. No basin-wide hydro-environmental or</li> </ol>	<ol style="list-style-type: none"> <li>1. Globally significant basin protected Identify strategic measures to address root causes of transboundary degradation of the Okavango River system</li> <li>2. International competition for water ameliorated</li> <li>3. Public participation in Okavango River basin management increases the sense of ownership of civil society over management and rehabilitation efforts</li> <li>4. Wide civil society support in the three riparian countries facilitates the planning and implementation of management measures (enabling transboundary issues to be addressed).</li> <li>5. Basin-wide synthesis made possible</li> <li>6. Improved understanding natural resource management and protection needs at basin level enabling follow-up action at national and regional levels.</li> <li>7. Improved regional capacity for data collection, integration, analysis and use in</li> </ol>	<ol style="list-style-type: none"> <li>1. A Strategic Action Programme is prepared to address basin degradation and is endorsed by all three riparian countries.</li> <li>2. Agreements on sharing of benefits concluded</li> <li>3. Process of consultation , communication, knowledge building and natural resource integration initiated at basin level and active fora for basin stakeholders established</li> <li>4. Improve linkages between regional stakeholders through meetings, Internet and print communications. Raise awareness of the findings of the Transboundary Analysis and sensitise stakeholders to the need for regional action to mitigate basin degradation</li> <li>5. Synoptic view of basin established, hydro-environmental and socio-economic data complete the regional</li> </ol>

Costs/Benefit	Baseline (B)	Alternative (A)	Increment (A-B)
	<p>socio-economic synthesis possible. Limited understanding of basin-wide implications of resource use and protection, (including) biodiversity hot spots and protected area needs. Limited knowledge of cross-border linkages</p> <p>7. ORB environmental data dispersed; collection and utilisation of Okavango data inadequate</p> <p>8. OKACOM cannot act as a substantive expert office.</p> <p>9. Lack of specific operational regional mechanisms to co-ordinate and implement joint action to manage transboundary river basins. Policy/legal/economic framework for co-ordinating and enforcing river management is inadequate.</p> <p>10. Lack of integrated strategic approach to Okavango River basin management and protection at regional scale. Okavango River basin activities not integrated into basin-wide approach .</p> <p>11. Lack of capacity to finance the transactions costs of regional co-operation.</p>	<p>decision-making.</p> <p>8. Adaptive and innovative river basin institution created</p> <p>9. Transboundary mechanisms established</p> <p>10. ORB countries committed to a co-ordinated basin-wide approach.</p> <p>11. Identification of innovative financing mechanisms for basin-wide management.</p>	<p>picture, transboundary knowledge base significantly enhanced.</p> <p>6. Clear spatial frameworks for natural processes and socio-economic dynamics established</p> <p>7. Furnish structured knowledge base for international discussion, negotiation and participation.</p> <p>8. OKACOM strengthened and transboundary policy initiatives launched</p> <p>9. institutional mechanisms to drive and co-ordinate basin-wide action. Improve understanding of policy/legal/ economic mechanisms required for integrated sustainable river basin management</p> <p>10. SAP process adopted in ORB region</p> <p>11. Financial sustainability of regional waterbody management measures and institutions assured.</p>

Purpose (Component)/Output		Baseline (B)	Alternative (A)	Increment (A-B)
<b>A. STRENGTHENED MECHANISMS FOR JOINT MANAGEMENT OF THE ORB</b>				
A1	Expertise Strengthened	0	1,234,900	709,900(GEF) 525,000(non-GEF)
A2	Stakeholder Participation	100,000	1,150,600	850,600 (GEF) 200,000 (non-GEF)
A3	Policy, legal, institutional and human resource initiatives	100,000	247,000	47,000 (GEF) 100,000 (non-GEF)
A4	Monitoring and Evaluation	0	165,000	165,000 (GEF)
<b>B. COMPLETED TRANSBOUNDARY DIAGNOSTIC ANALYSIS</b>		0	0	
B1	Water Resources Assessment and Analysis	1,150,000	3,101,000	551,000 (GEF) 1,400,000 (non-GEF)
B2	Socio-economic analysis completed to establish current and future patterns of water resource use and levels of demand	200,000	930,000	530,000(GEF) 200,000 (non-GEF)
B3	Super-imposed hydro-environment and socio-economic frameworks to define environmental system limits and parameters	0	96,000	96,000(GEF)
B4	Environmental assets of the ORB described and valued to structure water resource management models	0	120,000	120,000(GEF)
B5	Comprehensive set water of resource alternatives for the ORB assessed to structure model scenarios	0	360,000	360,000(GEF)
B6	Water resource development and management models used to produce water resource management options	0	130,000	130,000(GEF)
B7	A set of guidelines/criteria to guide SAP development and implementation	0	92,000	92,000(GEF)
<b>C. STRATEGIC ACTION PROGRAMME (SAP) FORMULATION</b>		0	0	
C1	Technical and policy implications of water resources management options evaluated	0	114,000	114,000(GEF)
C2	Joint integrated management programme (JIMP) for water sector investments negotiated and designed amongst riparians	29,500,000	29,925,000	425,000(GEF)
C3	Policy, legal, institutional and human resource commitments necessary for SAP implementation defined	0	140,000	140,000(GEF)
C4	SAP document produced and endorsed	0	250,000	250,000(GEF)
C5	SAP finance mobilised in preparation for implementation	0	165,000	165,000(GEF)
Total		31,050,000	38,220,500	7,170,500
Project Support Services				380,000
<b>PDF</b>				374,000
<b>Total Project Cost</b>				7,924,500

### Sources of Baseline and Co-financing

Output/Activity		Baseline	Co Finance
A1	Expertise Strengthened		Govts A/B/N staff and logistical support to OKACOM related activities(1999-2001) 325,000 UNDP support 1999 (N) 100,000 World Bank support 1999-2000 (A/N) 100,000
A2	Stakeholder Participation	GoN Decentralisation Programme (1999-2000)100,000	NGO support 1999(B) 50,000 NGO support 1999 (N) 50,000 UNDP support 1999-2001 (N) 100,000
A3	Policy, legal, institutional and human resource initiatives	Govts A/B/N water policy initiatives (1999-2001) 100,000	World Bank support 1999-2001 ( A/N) 100,000
A4	Monitoring and Evaluation	0	0
<b>COMPONENT A SUBTOTAL</b>		<b>200,000</b>	<b>825,000</b>
B1	Water Resources Assessment and Analysis	National natural resource info Govts A/N/B: \$250,000 (1999-2001) State of the Environment Reports Govts B/N: \$200,000 (1999) Groundwater Studies Govt B/N \$200,000 (1999-2001) Okavango Delta Research Station Private (B) \$500,000 (1999-2001)	Staff time and logistical support to national hydrometric programmes in the ORB: Govts A/N/B(1999-2001): \$ 1,300,000 World Bank support 1999-20001 A/ N 100,000
B2	Socio-economic analysis completed to establish current and future patterns of water resource use and levels of demand	National Social Assessments Govts B/N 200,000	Bilateral support 1999-2001 (N/A) 200,000
B3	Super-imposed hydro-environment and socio-economic frameworks to define environmental system limits and parameters	0	0
B4	Environmental assets of the ORB described and valued to structure water resource management models	0	0
B5	Comprehensive set water of resource alternatives for the ORB assessed to structure model scenarios	0	0
B6	Water resource development and management models used to produce water resource management options	0	0
B7	A set of guidelines/criteria to guide SAP development and	0	0

implementation		
<b>COMPONENT B TOTAL</b>	<b>1,350,000</b>	<b>1,600,000</b>

Output/ Activity		Baseline	Co Finance
C1	Technical and policy implications of water resources management options evaluated	0	0
C2	Joint integrated management programme (JIMP) negotiated and designed amongst riparians	GoA <sup>1</sup> : 8,000,000 (1999-20001) GoB <sup>2</sup> : 9,000,000 (1999-2001) GoN <sup>3</sup> : 12,500,000 (1999-2000) <b>Sub Total \$29,500,000</b>	0
C3	Policy, legal, institutional and human resource commitments necessary for SAP implementation defined	0	0
C4	SAP document produced	0	0
C5	SAP finance mobilised in preparation for implementation	0	0
<b>COMPONENT C TOTAL</b>		<b>29,500,000</b>	<b>0</b>
<b>GRAND TOTALS</b>		<b>31,050,000</b>	<b>2,425,000</b>

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<sup>1</sup> Estimated expenditures based on proposed multi-lateral assistance to Angola.

<sup>2</sup> Estimated expenditures of Department of Water Affairs in the project region.

<sup>3</sup> Estimated expenditures of Department of Water Affairs in the project region.

## Annex II. Logical Framework Matrix: SAP Development for the Okavango River Basin

Intervention Logic	Indicators of Performance	Means Of Verification	Assumptions
<p><b>Development Objective:</b></p> <ul style="list-style-type: none"> <li>To alleviate imminent and long term threats to the linked land and water systems of the OR through the joint management of the ORB water resources and the protection of its linked aquatic ecosystems (comprising all wetlands, fluvial and lacustrine systems) and their biological diversity.</li> </ul>	<ul style="list-style-type: none"> <li>Environmental indicators (state-response, stress reduction, and source vulnerability)</li> <li>Socio-economic indicators (policy, legal, and institutional processes)</li> </ul>	<ul style="list-style-type: none"> <li>International NGO and multilateral organisation reports</li> <li>National State of Environment Reports (Namibia and Botswana)</li> </ul>	<ul style="list-style-type: none"> <li>No unforeseen threats to the basin environment that cannot be addressed through joint management</li> <li>Enhanced basin management leads to flow of global and domestic benefits</li> <li>Political process remains stable</li> <li>Baseline planning and budgeting remains constant</li> </ul>
<p><b>Project Purpose:</b></p> <ul style="list-style-type: none"> <li>To strengthen mechanisms for joint management of the ORB.</li> <li>To complete a transboundary analysis to underpin a programme of joint management.</li> <li>To facilitate the formulation of an implementable SAP to address threats to the basin's linked land and water system</li> </ul>	<ul style="list-style-type: none"> <li>Consultative fora established.</li> <li>Enabling environment (policy, law institutions and human resources) enhanced</li> <li>Public and private sector capacity to implement SAP</li> <li>OKACOM review completed and internalised</li> <li>Completed TDA</li> <li>SAP endorsed and financed</li> </ul>	<ul style="list-style-type: none"> <li>Annual and periodic reports from OKACOM and Ministries of Environment, Water and Agriculture and NGOs etc.</li> <li>Government policy statements</li> <li>Economic planning reports</li> <li>Ministry staffing tables and private sector inventory</li> </ul>	<ul style="list-style-type: none"> <li>Countries commit to and donors agree on SAP</li> <li>Processes to ensure enhanced basin management are sustained beyond life of project</li> <li>Processes can be synchronised by all three riparians</li> <li>Donor support is locked in</li> </ul>
<p><b>Project Components/Outputs:</b>      <b>A. STRENGTHENED MECHANISMS FOR JOINT MANAGEMENT OF THE ORB</b></p> <p><b>Output A1.</b>      Expertise within the riparian countries strengthened to drive the necessary inter-governmental and intra-governmental technical and policy initiatives in water resource planning and management of the ORB</p> <p><b>Output A2</b>      Basin-wide mechanisms for stakeholder participation in basin management established and tested to secure consensus and ensure replicability and taking to scale</p> <p><b>Output A3</b>      Policy, legal, institutional and human resource initiatives launched for the ORB and linked to national policy reviews to co-ordinate water resource management approaches across the basin</p> <p><b>Output A4</b>      Monitoring and evaluation procedures for implementation of joint management</p> <p style="text-align: center;"><b>B. COMPLETED TRANSBOUNDARY DIAGNOSTIC ANALYSIS</b></p> <p><b>Output B1</b>      Water resource assessment and analysis completed to establish hydro-environmental processes, characteristics and limits</p> <p><b>Output B2</b>      Socio-economic analysis completed to establish current and future patterns of water resource use and levels of demand</p> <p><b>Output B3</b>      Water resource and socio-economic analysis super-imposed to define environmental system limits and parameters</p> <p><b>Output B4</b>      Environmental assets of the ORB described and valued to structure models</p> <p><b>Output B5</b>      Comprehensive set water of resource <u>alternatives</u> for the ORB assessed and tested (at pilot level) to structure model scenarios</p> <p><b>Output B6</b>      Water resource development and management <u>models</u> used produce water resource management options</p> <p><b>Output B7</b>      Economic and environmental <u>criteria</u> produced to guide water resource development and allocation decisions</p> <p style="text-align: center;"><b>C. STRATEGIC ACTION PROGRAMME (SAP) FORMULATION</b></p> <p><b>Output C1</b>      Technical and policy implications of water resources management options evaluated</p>			

<b>Output C2</b>	Joint integrated management plan negotiated and designed
<b>Output C3</b>	Policy, legal, institutional, human resource and financial arrangements and <u>commitments</u> necessary for SAP implementation defined
<b>Output C4</b>	SAP document produced and endorsed through integration of outputs C1, C2 & C3 in <u>collaborative process</u> with SAP partners
<b>Output C5</b>	SAP finance mobilised in preparation for implementation through WB led donor conference

Intervention Logic	Indicators of Performance	Means Of Verification	Assumptions
<b>Output A1.</b> Strengthened <u>expertise</u> to drive both inter-governmental and intra-governmental technical and policy initiatives in water resource management for the ORB	<ul style="list-style-type: none"> <li>Project expertise transferred and internalised by riparian countries by end of project</li> </ul>	<ul style="list-style-type: none"> <li>PMU progress and expenditure reports and published ORB Forum newsletters</li> </ul>	<ul style="list-style-type: none"> <li>PMU demonstrate its expertise and influence partner organisations.</li> </ul>
Activities A1.1 Establish a Project Management Unit (PMU) and National Co-ordination Units (NCUs) to execute all project activities at regional and national level and support OKACOM for the duration of the project. A1.2 A review of OKACOM mandates and functions A1.3 Establish regional expert groups on water resource management and environmental protection A1.4 PMU/NCU to assess and service national and regional training needs in environmental policy, legislation, basin management and communication skills A1.5 Create an inter-ministerial project management committee with representation from key ministries in environment, water, energy, mining, agriculture, planning and finance and including Implementing Agencies, NGOs, research institutions and PMU representatives .	<ul style="list-style-type: none"> <li>PMU operational within 3 months of project inception</li> <li>OKACOM review completed and recommendations put to OKACOM meeting in first year of project</li> <li>Expert working groups working within 6 months of project inception</li> <li>Training needs identified within 6 months of project inception</li> <li>project management committee convened within first three months of project and regular quarterly meetings scheduled</li> </ul>	PMU publications	
<b>Output A2</b> Enhanced basin-wide mechanisms for <u>stakeholder participation</u> in water resource planning and management established to secure consensus.	<ul style="list-style-type: none"> <li>Okavango River Basin Forum (inc. sub-fora) established at district/provincial, national and basin level by end 2000</li> </ul>	<ul style="list-style-type: none"> <li>PMU progress and expenditure reports Published ORB Forum newsletters</li> </ul>	
Activities A2.1 Consolidate identification of key stakeholders A2.2 Initiate the consultative process in Angola A2.3 Extend the consultative process in Botswana A2.4 Extend the consultative process in Namibia A2.5 Regional <u>stakeholder consultations</u> : sponsor and organise bi-annual basin NGO sub-forum A2.6 Undertake selected <u>pilots and demonstrations</u> in each country to test replicability and taking to scale during SAP implementation A2.7 Improve web access A2.8 Publish and disseminate SAP information A2.9 Create public awareness and environmental education campaigns environmental curricula	<ul style="list-style-type: none"> <li>Public invitations issued</li> <li>Public meetings Cubango/Cuito</li> <li>Outreach to schools and institutions</li> <li>Outreach to schools and institutions</li> <li>NGO sub-forum established</li> <li>Environmental curricula adopted in schools</li> <li>Pilots projects identified , executed and evaluated</li> <li>Web site updated monthly by mid 1999.</li> <li>Publications compiled and broadcast on quarterly basis from mid 1999</li> </ul>	<ul style="list-style-type: none"> <li>Published list of stakeholder groups</li> <li>Minutes of public meetings</li> <li>Minutes of NGO sub-forum published</li> <li>Published minutes and formal expressions of interest/co-financing OKACOM publications produced digitally</li> <li>Hardcopy publications publicly available in all three riparian countries</li> <li>Press coverage</li> </ul>	<ul style="list-style-type: none"> <li>The ORB initiative is embraced at all levels</li> <li>Stakeholders responsive to consultation process</li> <li>Communication channels open frequently and are stable and cheap</li> </ul>

Intervention Logic	Indicators of Performance	Means Of Verification	Assumptions
<p><b>Output A3.</b> Policy, legal, institutional and human resource initiatives launched and linked to national policy reviews to co-ordinate water resource management approaches across the basin</p>	<p>Policy statements and institutional reviews carried out in key sector departments at national level and within OKACOM at regional level</p>	<p>Endorsed map of function institutional linkages at national and basin level published by OKACOM</p>	<p>All relevant institutions agree to be part of initiative.</p>
<p>Activities</p> <p>A3.1 Specify natural resource linkages within national administrations/jurisdictions and NGOs associated with the basin boundaries</p> <p>A3.2 Link the basin initiative to regional planning and socio-economic development initiatives and the activities of regional NGOs.</p> <p>A3.3 Evaluate current national policy, legal, institutional and human resource arrangements in respect to basin co-ordination and joint management</p> <p>A3.4 Evaluate the use of existing regional and national legal instruments to facilitate basin co-ordination and joint management</p> <p>A3.5 Formulate national and regional policy initiatives to facilitate basin co-ordination and joint planning</p> <p>A3.6 Convene regional expert group meetings environmental policy, legislation and basin management and publish findings</p> <p>A3.7 Prepare draft water management agreements and protocols for consideration by OKACOM</p>	<ul style="list-style-type: none"> <li>• All institutional players identified in formally agree to participate in the ORB initiative in first 12 months of project</li> <li>• National policy initiatives launched and institutional and legal arrangements reviewed in all three riparian countries in first 24 months of project</li> <li>• Regional co-operation agreements reviewed by end of project</li> </ul>		
<p><b>Output A4:</b> Monitoring and Evaluation Procedures for SAP implementation</p>			
<p>A1.1 Develop hydro-environmental and institutional adaptation sustainability indicators</p> <p>A1.2 Develop monitoring and evaluation procedures</p>			

Intervention Logic	Indicators of Performance	Means Of Verification	Assumptions
<p><b>Output B1.</b> Water resource assessment and analysis completed to establish hydro-environmental processes, characteristics and limits</p>	<p>Reports/data collection services commissioned in first year and completed to terms of reference by end of second year.</p>	<p>Reports published by PMU</p>	<ul style="list-style-type: none"> <li>• Data collection in Angola not impeded by peace process</li> <li>• Data of sufficient precision compiled to enable completion of frameworks at resolution appropriate for SAP implementation</li> </ul>
<p>Activities</p> <p>B1.1 Consolidate the network of water resource specialists in the region</p> <p>B1.2 Convene technical working groups on hydro-environmental processes</p> <p>B1.3 Commission a maximum of 5 full cable-way and continuous level river recording stations throughout the basin to serve as benchmark stations for SAP implementation</p> <p>B1.4 Commission level recorders and spot gauging sites in the upper Angolan sub-basins</p> <p>B1.5 Commission targeted reports on specific hydrological, hydrogeological and hydro-ecological processes associated with priority water uses and management options</p> <p>B1.6 Specific assessment of the amount of water, its quality and timing of availability through the system that is needed to sustain the Delta</p> <p>B1.7 Consolidate national water resource data and structure for use in basin analysis</p> <p>B1.8 Produce associated GIS/mapping products through the use of multi-temporal imagery</p> <p>B1.9 Design, calibrate and validate distributed models of surface and groundwater processes</p> <p>B1.10 Prepare detailed analyses of basin processes, characteristics and limits</p> <p>B1.11 Produce working hydro-environmental framework integrating processes, characteristics and limits</p>	<ul style="list-style-type: none"> <li>• Frameworks elaborated on basis of all spatial and thematic data collected under Output B1 by end 2000</li> <li>• GIS products available by end 2000</li> </ul>	<ul style="list-style-type: none"> <li>• Frameworks published by OKACOM as a basin atlas</li> </ul>	

Intervention Logic	Indicators of Performance	Means Of Verification	Assumptions
<b>Output B2.</b> Socio-economic analysis completed to establish current and future patterns of water resource use and levels of demand	Reports/data collection services commissioned first half year 1 and completed to terms of reference by end year 2	PMU publications	Proxy assumptions
Activities B2.1 Consolidate the network of social and economic experts from the region B2.2 Compile demographic framework for basin from published sources B2.3 Commission social surveys in Angola to assess current future patterns of demand for raw water B2.4 Establish basin-wide patterns of demand B2.5 Assess opportunity cost of water across the basin B2.6 Produce working socio-economic framework to integrate demographic and demand characteristics			
<b>Output B3.</b> Super-imposed hydro-environment and socio-economic frameworks to define environmental system limits and parameters	Frameworks compiled in GIS product and analysis initiated mid year 2 and completed by first quarter year 3.		
Activities B3.1 super-impose hydro-environmental and socio-economic frameworks B3.2 Identify environmental hot-spots, fixed and transient B3.3 Evaluate limits of sustainable use in space and time			
<b>Output B4</b> Environmental assets of the ORB described and valued to structure water resource management models	Valuation of assets entered into basin planning model in year 1.	PMU publications	
Activities B4.1 Identify environmental entities linked to water in the ORB B4.2 Select valuation method(s) B4.3 Apply valuation method through targeted surveys B4.4 Describe and quantify in linkages in economic terms			

Intervention Logic	Indicators of Performance	Means Of Verification	Assumptions
<b>Output B5</b> Comprehensive set of water resource <u>alternatives</u> for the ORB assessed to structure model scenarios	Alternatives assessed in year 1		
Activities B5.1 Identify sources of freshwater in the region outside the basin that present feasible alternatives of raw water B5.2 Identify and examine resource management opportunities (structural and non-structural) for the region B5.3 Form model component as alternative source or substitute B5.4 Execute demonstration and pilot studies in enhanced recharge, conjunctive use and demand management			
<b>Output B6.</b> Water resource development and management <u>models</u> used to produce water resource management options	Models designed and compiled on basis of Outputs B1 and B2 by mid year 2 and options produced end year 2	Databases published (hard and soft) and accessible	No restrictions on sovereign data
Activities B6.1 Evaluate environmental and economic impact of a set of alternative water resource development and allocation scenarios through the use of appropriate interactive basin planning models (WEAP, STELLA@II etc.)			
<b>Output B7.</b> Economic and environmental <u>criteria</u> produced to guide water resource development and allocation decisions.	Transparent criteria agreed for all hydro-environmental, ecological and socio-economic process by end year 2	Guidelines published and disseminated to stakeholders by OKACOM	Knowledge base adequate to develop appropriate and practical criteria.
Activities B7.1 Define the design state for the basin B7.2 Develop environmental criteria for resource use and guidelines for resource protection B7.3 Develop socio-economic criteria for resource allocation B7.4 Develop guidelines for implementation of the SAP			

Intervention Logic	Indicators of Performance	Means Of Verification	Assumptions
<b>Output C1</b> Technical and policy implications of water resources management options evaluated	Evaluation complete by first quarter year 3		
Activities C1.1 Present model outputs to basin stakeholders C1.2 Feedback responses to policy makers			
<b>Output C2</b> Joint integrated management plan (IMP) negotiated and designed amongst riparians	IMP finalised by first half year 2	OKACOM negotiations	Bi-lateral relationships stable
Activities C2.1 Prepare plan on basis of stakeholder consultation C2.2 Negotiate plan			
<b>Output C3</b> Policy, legal, institutional and human resource <u>commitments</u> necessary for SAP implementation defined	Commitments declared third quarter year 3.	Government statements, cabinet memoranda	
Activities C3.1 Solicit commitments from governments C3.2 Confirm commitments			
<b>Output C4</b> SAP document produced through integration of outputs C1, C2 & C3 in <u>collaborative process</u> with basin stakeholders and SAP partners (donors, NGOs, research institutions., schools etc)	SAP formally endorsed by riparian countries third quarter year 3. Finance plan for SAP implementation agreed with governments, donors and investors	Draft and final SAP published by OKACOM	Bi-lateral relationships stable
Activities C4.1 Draft a detailed Strategic Action Programme C4.2 Present to national and regional fora C4.3 Consensus on timetable for implementation	<ul style="list-style-type: none"> <li>Published SAP document by 2003</li> <li>3 national and 1 regional SAP workshops held in 2003</li> <li>Implementation schedule agreed end 2003</li> </ul>		
<b>Output C5</b> SAP finance mobilised in preparation for implementation	Finance plan finalised end year 3		Investor confidence maintained.
Activities C5.1 Periodic donor roundtables to focus on SAP formulation C5.2 Major donor conference to discuss the final draft of the SAP and solicit support for implementation			

### Annex III: STAP Roster Technical Review

#### **1. Overall Impression.**

The Okavango River system is of critical global (as well as local) importance. Well organised efforts to effect a collaborative approach for the protection of the unique ecosystem assets through the efficient use of the basin's assets should be given highest priority. The present proposal effectively initiates a planning process that can achieve these goals. The proposal recognises the importance of participation of the riparian countries and the major stakeholders while insisting on scientifically valid methods of assessment and planning.

#### **2. Relevance and Priority.**

The proposed project is very important to the long run success of the development aspirations of the riparian countries as well as to the maintenance of one of the world's truly unique ecosystems. The maintenance of the Okavango Delta is of global importance because of its unique features, but it is also of immediate importance to the economies of the riparian countries. Tourism related to the Okavango Swamp and the scientific importance of that ecosystem warrant the development of efficient action plans that will allow both needed economic developments and environmental protection.

#### **3. Approach.**

The recommended approach is appropriate in its main features: networking and communication; completion of an adequate hydro-environmental and socio-economic framework; and establishment of a viable planning, co-ordination and enforcement structure. It would be advantageous, however, to develop early in the action plan process more detailed guidelines that help identify priorities in the gathering of data and the types of scenarios that truly identify the tradeoffs faced by the riparian countries in deciding on an action plan. Such guidelines must be derived from an overall list of key issues that constitute the heart of river basin planning: key water uses and their marginal values from a total value viewpoint; tradeoffs between upstream uses and downstream uses; tradeoffs between environmental protection and traditional economic activities; equity considerations among the riparian countries, including plans for compensation of parties that lose in the interests of the overall system.

The strategic approach noted on p. 8 of the present version consists of three main processes, key components in the development of the SAP: (1) comprehensive consultation and communication; (2) enhanced hydro-environmental and socio-economic knowledge base; and (3) progressive natural resource POLICY FORMULATION, CROSS-SECTORAL INTEGRATION AND COORDINATED PROGRAMMING. This title for the third component correctly describes what the intended activities are to be. Elsewhere in the Brief, this set of activities is called "natural resource management in the ORB" (e.g. on p. 10, p. 16, annex tables) which is misleading. Readability would be improved by using the title given as (3) just above.

#### **4. Objectives.**

The objectives are clearly and correctly stated: a protected river basin and wetland system (p. 8); socio-economic gains related to the healthy ecosystem; and integrated resource use policies carried out through adaptive management institutions.

#### **5. Background and Justification.**

These are sufficiently provided in the introductory sections of the document.

#### **6. Activities.**

(ref. Project Components and Expected Results, p. 13 ff) Output B3 needs greater detail and emphasis, as well as being scheduled earlier in the project exercise (this was noted earlier). At present, a clear strategy for guiding the major component activities, especially outputs

B1 and B2, is lacking.

**7. Project Funding.**

Proposed levels of funding are said to be based on experience in carrying out the TDA. More detailed costing would be helpful, especially for the larger items and, particularly, the funds requested for "an enhanced OKCOM" (p.23).

**8. Time Frame.**

The time frame seems reasonable.

**9. Rationale for GEF Support.**

The project appears to be totally congruent with the intent and policies of the GEF insofar as this reviewer understands them. The GEF can make a very important contribution to global conservation and to the evolution of new policies that make the tradeoffs between environmental protection and economic-demographic development as efficient as possible.

**10. Added Comments.**

- a) the project milestones (p. 12) need to be sharpened and made more detailed.
- b) the phasing of the outputs should be changed (as noted earlier) to provide clearer guidelines for the execution of the data gathering phases.
- c) the question of the separation of policy making and "execution" (p. 20) should be given further consideration. It is not clear that this is really intended (see functions of OKCOM), nor is it clear that this should be done, given the limitations on personnel and decision capacity.

**Annex IV: Map of Okavango River Basin**

Figure 1: Strategic Approach to Project Design

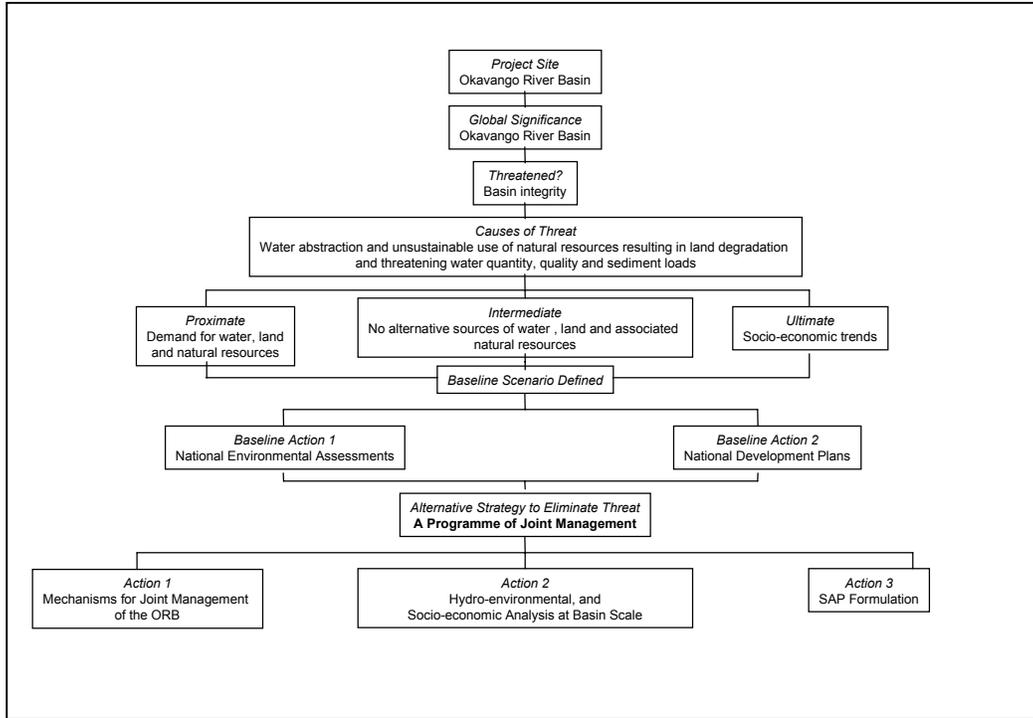
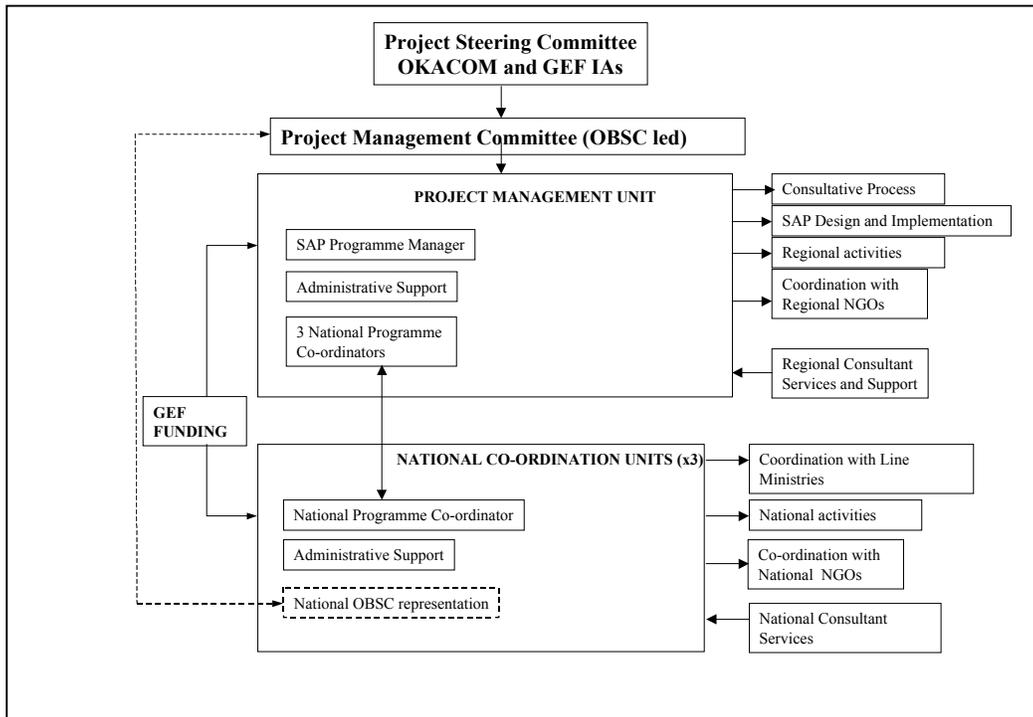


Figure 2. Project Implementation Arrangements



**Annex VI: Root Cause: Table of Contents & Summary of Draft Transboundary Diagnostic Analysis**

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## 4. HYDROLOGY, HYDRAULICS AND HYDROGEOLOGY OF THE OKAVANGO RIVER

### 4.1 Hydrology

#### 4.1.1 General

#### 4.1.2 Information Gaps

#### 4.1.3 Work required

##### 4.1.3.1 Hydrometric Network

##### 4.1.3.2 River Modelling

### 4.2 River Morphology, Hydraulics, Erosion, Sediment Loads and Sedimentation

#### 4.2.1 Data Collection and Work Required

### 4.3 Groundwater

#### 4.3.1 General

#### 4.3.2 Information Gaps and Work Required

## 5. WATER QUALITY OF THE OKAVANGO RIVER

### 5.1 Ambient Characteristics, Dissolved Solids, Salinity, Fertilisers

#### 5.1.1 General

#### 5.1.2 Information Gaps and Work required

##### 5.1.2.1 Introduction/general

##### 5.1.2.2 Uncertainties in Chemical Processes

##### 5.1.2.3 Methodologies and Analytical Procedures

##### 5.1.2.4 Monitoring Chemical Constituents and Baseline Determinants

##### 5.1.2.5 Area Selection Criteria

##### 5.1.2.6 Work programme

### 5.2 Water-borne diseases/health Hazards

#### 5.2.1 General

#### 5.2.2 Information Gaps

#### 5.2.3 Work required

##### 5.2.3.1 Investigations, Data Collection and Research

##### 5.2.3.2 Research and Analysis

## 6. THE OKAVANGO RIVER ECOSYSTEM(s)

### 6.1 Primary Production

#### 6.1.1 Information Gaps and Work Required

- 6.1.1.1 General
- 6.1.1.2 Taxonomy
- 6.1.1.3 Mapping
- 6.1.1.4 Ecosystem Functioning and Plant Environmental Requirements
- 6.1.1.5 Monitoring Issues
- 6.1.1.6 Resources and Management

### 6.2 Secondary Production

#### 6.2.1 General

#### 6.2.2 Information Gaps

- 6.2.2.1 Mammals
- 6.2.2.2 Fish and Fisheries
- 6.2.2.3 Birds
- 6.2.2.4 Reptiles
- 6.2.2.5 Amphibians
- 6.2.2.6 Terrestrial Invertebrates
- 6.2.2.7 Aquatic Invertebrates

#### 6.2.3 Further Studies Required

- 6.2.3.1 Mammals
- 6.2.3.2 Fish and Fisheries
- 6.2.3.3 Birds
- 6.2.3.4 Reptiles
- 6.2.3.5 Amphibians
- 6.2.3.6 Terrestrial Invertebrates
- 6.2.3.7 Aquatic Invertebrates

### 6.3 Functioning of the Ecosystem

### 6.4 Influence of Man

## 7. MAN AND THE OKAVANGO RIVER BASIN

### 7.1 Introduction

### 7.2 The People and their Socio-economic Structure

- 7.4.1 General
- 7.4.2 Demographic Data
- 7.4.3 Economic Activities
- 7.4.4 Social and Economic Stratification
- 7.4.5 Natural Resource Use
- 7.4.6 Maps and GIS Data

### 7.3 Asset Ownership and Legislation

### 7.4 Natural Resources Utilisation, and Natural Resource Economics

#### 7.4.1 Water

- 7.4.1.1 Unit Water Demand and Projections of Water Demand
- 7.4.1.2 Water Supply Balances
- 7.4.1.3 Role of the Okavango River as a source for Water Supply
- 7.4.1.4 Okavango River Consumer Register
- 7.4.1.5 Legislation and regulation
- 7.4.1.6 Management Information Systems

#### 7.4.2 Other Natural Resources

- 7.4.2.1 Protected Areas and Tourism
- 7.4.2.2 WMAs and associated CHAs
- 7.4.2.3 Urban Areas
- 7.4.2.4 Land Use

## SUMMARY

### **Introduction**

One of the aims of the PDF work has been to prepare a Transboundary Diagnostic Analysis (TDA) of the Okavango upon which to develop a Strategic Action Programme (SAP). The TDA has been based on the inputs of some 20 specialists drawn from the three riparian countries who were responsible for individual reports on the status of the ORB. The TDA was divided in to two sections. Section A describes the data available and an overview of the subject and Section B highlights data deficiencies and outlines work that will be required to develop a SAP. The summary, combines the two sections.

### **Availability of Information**

A total of twenty national consultants were commissioned within the three riparian states to compile specialist reports covering a wide range of relevant topics. In general, the approach was to commission reports to cover areas and topics not covered in other studies and to try by these means to acquire a good overall summary of existing knowledge within the basin. For some of the topics covered this was easier than others, and the usefulness of the reports received varied considerably. The work of the consultants in Angola was particularly difficult for a number of reasons. These include difficult communications, no possibility of visiting the catchment, difficulty in obtaining data from government offices, and a generally extreme lack of any up-to-date information on almost all the fields of study. The need for a concentration of efforts within the Angolan part of the catchment during the SAP preparation is clear.

### **Stakeholder Consultation and Participation**

A key goal of the PDF work was to establish co-ordination and consultation mechanisms – that is to establish channels of communication for the further effective co-ordination, consultation and co-operation between basin stakeholders. This will facilitate stakeholder participation in the implementation of the SAP. Stakeholders were broadly defined as those parties which have a perceived interest in what happens in and to the Okavango River Basin as well as those who would be affected directly or indirectly by developments. While this goal was largely achieved in Botswana and Namibia, progress within Angola was limited by operational difficulties, and it is clear that the consultative process will still have to be properly initiated there.

The scope of the communication and consultation component during the PDF work and during its SAP preparation and implementation should not be underestimated, particularly when involving communities and interest groups. This process necessarily drives the design of the alternative course of action and the achievement of global environmental objectives. In this regard it is considered important that education is incorporated into communication. Attitudes and practices can be changed through education and it is through this that an integrated basin management plan can best and most successfully be implemented.

The work that needs to be carried out with respect to Stakeholder Consultation and Participation falls into three main categories,

1. A high intensity effort during the first 3 to 6 months of the project to initiate the process in Angola and further extend it in Namibia and Botswana during which time the main points arising can be incorporated into the outline Strategic Action Plan.
2. A continuing effort in which the main aim will be to maximise interest and input from all stakeholders.
3. Presentation and discussion of a final SAP

Categories 1 and 2 will include a programme to establish comprehensive understanding of the ORB in school curricula in the region. A certain number of bursaries could also be made available to the most able of the school leavers to enable them to study further. It is also proposed that a small number of suitably qualified graduates, preferably from the region, could be employed alongside the school leavers in order to strengthen capabilities in catchment management and conservation. Previous experience has shown that this type of project can often attract funding for PhD and post-graduate studies, and this sort of support should be encouraged, but not at the expense of the education of the grass root stakeholders.

### **General Catchment Information: the mapping base**

Topographic mapping at various scales is, in principle, available for the entire catchment. The scales used vary from country to country, although all three countries have mapping available at both 1:250 000 and 1:500 000. Namibia has up-to-date 1 : 50 000 mapping for its Okavango Region, but otherwise mapping is at least 15 -30 years old.

High resolution digital satellite imagery (Thematic Mapper) covering all of the catchment in Angola, and active parts within Botswana and Namibia for July/August 1993 were purchased, processed and printed as part of the TDA activities. Once sufficient ground observation has been carried out, these will represent the best available general mapping for the catchment in Angola. Slightly lower resolution imagery (Landsat) covering the catchment in Angola for August 1973 were also purchased and processed and these will be used to assess changes in the catchment over the last twenty years.

The suggested methodology for the production of useful; mapping will be to scan and digitise the existing 1 : 100 000 (or 1:50 000) mapping where this is not already available. The information on these maps should be limited to infrastructure (roads, towns etc) and contours. The 1993 TM Landsat imagery (or more recent) should be used as a backdrop for these maps and will allow the up-dating of infrastructure, such as the position of roads, settlements , agricultural developments, land-use changes.

For both environmental assessment and river basin management purposes, the production of a regional standardised soils database is imperative. The Soil and Terrain Database for Southern Africa (to be released by FAO) contains a preliminary correlation of Angolan soils to the FAO Revised Legend in addition to a full dataset of Botswana soils.

The initial scope of work to be undertaken in the environmental assessment phase should focus on the development of a regional soils database in which information is based upon the FAO Revised Legend and from which thematic maps may be derived at a scale of 1:250,000. This

scale is consistent with the general scale to be utilised for the base satellite mapping. It is also a convenient scale for the production of hard copies of complete satellite image scenes.

### **The Physical Background: Climate, Hydrology, Hydraulics and Hydrogeology of the ORB**

Mean annual precipitation decreases from around 1350mm over the headwaters of the Cubango River down to around 450mm at Maun. Up to 20 rain gauges once operated within the catchment area in Angola, but no data are available since 1975. In the Namibian portion of the catchment relatively long rainfall records are available for 11 stations along the riverside. There are 7 established rain gauge stations located in the Delta area, generally around its peripheries, and an expansion programme is currently underway. There are virtually no rainfall intensity data. The need to collect supplementary rainfall and other climate data is fundamental, especially within Angola to complete the TDA. It is anticipated that low cost telemetrically-linked data collection platforms with a range of climatic sensors will be used to ensure precision

The Cubango River rises in the Bié plateau, Angola's hydrographic centre, the Cuito River further to the east. In Angolan territory, the basin covers an area of 148 860 Sq. Km, of which 60 860 belongs to the basin of the Cuito River. On reaching the border with Namibia the Cuito River makes its confluence with the Cubango (Okavango) River and then turns more southwards, crosses the Namibian Caprivi Strip and enters Botswana. Seventy kilometres further downstream the mainstream starts to divide and the Okavango Delta is formed. Flow of the Okavango and Cuito Rivers just upstream of their confluence is estimated at 5391 Mm<sup>3</sup>/a and 4350 Mm<sup>3</sup> respectively. At Mohemebo at the top of the panhandle the mean annual runoff is approximately 9900 Mm<sup>3</sup>/a. Flows in the Okavango River even close to the confluence show great variability with a minimum flow of a little as 13m<sup>3</sup>/s, but a maximum of as high as 909m<sup>3</sup>/s. By contrast the flow of the Cuito River just upstream of the confluence rarely drops below 90m<sup>3</sup>/s, but only rises to around 550m<sup>3</sup>/s on very rare occasions.

No river flow data have been collected upstream of Rundu in Namibia since 1975. The longest record for any station in Angola is only 12 years and many are much shorter. Thus while relatively reliable records of more than 50 years exist for the downstream reaches of the river, information on the main runoff-generating portions of the catchment is patchy, of questionable accuracy and representing a very limited time period. A priority task will be to set up a new gauging network in the Angolan portion of the catchment. In many cases it will be necessary to select new sites.

While the hydrogeology of the Okavango region within Namibia and Botswana has been investigated on an ad-hoc basis only. Monitoring of both levels and quality is an important issue especially around the Delta. Groundwater quality is generally good although there are isolated areas downstream of the Delta where TDS values can be as high as 2000mg/l. There are no recent data available for the catchment within Angola and this is an area which will require investigation during the project to develop the SAP

## **Water Quality and Chemistry**

Detailed studies on water quality in the Angolan and Namibian portions of the catchment are lacking. A 1984 survey measured a range of chemical parameters at 35 mainstream and 10 backwater sites along the river in Namibian territory. Other water quality data are available from The Division of Water Environment within DWA Namibia. The water quality of the water in the Okavango rivers measured in the section shared by Namibia and Botswana is relatively good, and this is likely to be the case for the upstream tributaries. The water is typically soft, with very low conductivity. Chemical and nutrient concentrations are low. The pH of the Okavango surface water varies between 5.9 to 7.6. The temperature of Okavango water entering the panhandle varies seasonally and ranges from 18°C in July to 29°C in January. Temperatures are generally found to be 3 to 4 degrees higher at the distal end of the Delta, ranging from 22°C in July to 32°C in January.

Dissolved Oxygen content throughout the flowing waters of the Okavango is generally high and near saturation conditions. Predicting the mass of TDS added to the overall system by rainfall is limited by seasonal variability in volume, distribution, infiltration and runoff. However, rainwater TDS mass is around 3% of floodwater mass derived from the Angolan mountains, so a crude estimate would be in the range of 8 000 to 10 000 tonnes of TDS and therefore could have a significant input on water chemistry/quality. Little to no work has been done on rainwater chemistry. Approximately 96% of the water entering the Okavango Delta is lost through evapotranspiration. Two percent leaves via groundwater paths and two percent leaves via surface flow.

The mass of TDS of inflow water to the Delta is approximately 400 000 tonnes. The outflow is only 30 000 tonnes, but the occurrence of saline surface water is rare.

Inorganic and organic toxic constituents of water in the Okavango Delta are present in low values and represent mostly natural background accumulations. It is important, however, to establish a baseline of present concentrations, should the concentrations change through later development.

No recent information exists on the ambient water quality of the Cubango and Cuito Rivers and their tributaries within Angola, and this should be collected as soon as possible. It is important to collect data up and downstream of major settlements such as Menongue and other large settlements and to monitor this regularly .

## **The Okavango River Ecosystem**

Almost no work has been done in the Angolan portion of the catchment. By contrast, aspects of flora, fauna and ecosystems have been studied in some detail in Namibia and especially Botswana. Despite this, a number of fundamental issues requiring detailed study have been identified in Namibia and Botswana.

With respect to the catchment in Namibia, very little original research (with the exception of fish studies) has been done in recent years. The lack of comprehensive baselines, long-term data

series and monitoring programmes in Namibia, which are relevant to developing an understanding of the biology and ecosystem functioning, is a major problem in clarifying the potential impacts of the broad scale changes that have occurred as a result of human interventions over the past 20 years.

No studies have been carried out in the Namibian sector of the river which detail the determinants and processes involved in defining the principal riverine and associated vegetation units. The importance of plants in the hydrological and biological cycles of the river has not been studied in any detail. This work is clearly fundamental to a good understanding of the functioning of the ecosystem.

While the use of satellite imagery will be an extremely important component in vegetation and land-use studies, the need for sufficient fieldwork can not be over-emphasised.

Ultimately the aim of this part of the work will be to achieve an understanding of the linkages between climate, runoff, physical determinants, primary and secondary producers. In this particular study, which must not be seen as merely an inventory exercise of flora and fauna, it is particularly important to understand how the ecosystems are functioning and how they are affected by natural or man-made changes to flora and fauna and water management regimes. Evidence from research in the Delta has already established the sensitive links between hydrochemistry, sediment, flora and channel hydraulics. Understanding of the same hydrogeomorphological links needs to be extended upstream to assess the vulnerability of the Angolan sub-basins.

### **Man and the Okavango River Basin**

The population density of the Okavango river Basin in general is low, although the river-side environment is, in places quite heavily settled. Demographic information for Namibia and Botswana, although several years out of date is quite accurate. Large settlements within the catchment are limited in number. With a population of around 100, 000, Menongue is by far the biggest town in the Angolan portion of the basin.

Water demand is currently low due to the absence of industry and major irrigation schemes. There are currently no large-scale water transfer schemes taking water out of the system although such a scheme is part of Namibia's short to medium-term planning. Domestic demand in Angola is particularly low due to a lack of water distribution infrastructure. This can be expected to increase dramatically as peace leads to an increase in the standard of living and pressures for development, irrigated agriculture in particular.

Population pressures in Botswana and especially Namibia have led to significant degradation of the riverside environment. The poor condition of the Namibian flood plains and their immediate proximity, which has developed over the last two decades, is in sharp contrast with the Angolan side of the river. This is clearly visible from a comparison of 1973 and 1993 satellite imagery. By contrast a comparison of the imagery covering the catchment within Angola indicates that there has been little significant degradation. Indeed, for some areas the catchment looks less impacted in 1993 than it did in 1973. For the few urban areas, monitoring of water use and effluent production will be necessary. Population and industrial growth both result in increased

demand for water supply of a given quality and both result in the production of water of lower quality.

Man's activities are concentrated around agriculture, fisheries and tourism. Within the agriculture sector the emphasis is on cattle-farming although cereals are grown extensively at a subsistence level. Livestock levels in Angola have been reduced to nearly zero. There are a handful of medium-sized irrigation schemes in Namibia and also on the panhandle in Botswana.

An inventory of land-use will be a useful point of departure, although some care will have to be taken with respect to the catchment in Angola to look at likely future scenarios representing a situation of normality. Within all three countries no survey on the extent of subsistence and commercial use of and dependency on key natural resources has been done. No quantitative data exist on rates of extraction for any plant species. This is an issue of major concern because of the large increase in commercial off-takes of reeds and thatching grass for sale in main centres such as Maun. Within Angola, it will once again be important to look at historical and potential use of natural resources. It will be necessary to complete the existing picture of asset ownership and to consider carefully how existing ownership within the catchment will fit in with integrated management of the basin, since no management plan can function if it does not fit with existing ownership and management patterns.

**Annex VII: National Expert Group and Specialist Report Titles**

<b>REGIONAL EXPERT</b>	<b>TITLE OF REPORT</b>
E. Bereslawski	Geohydrology, Geology and Soils of the Cubango River Basin ; Angolan Sector
A. Grion	Demographics and Socio-economics ; Angolan Sector
F.A. Leite	Flora/Fauna ; Angolan Sector
H. dos Santos	Agriculture and Land Use Studies ; Angolan Sector
R. Marques	Climate, Hydrology and Water Resources ; Angolan Sector
I. dos Santos	Communication and Consultation ; Angolan Sector
D. Alheit	A Photographic Reconnaissance Survey of the Cubango and Cuito River Basins in Angola
L. Cassidy	The Human Environment ; Botswanan Sector
A. Sefe	Climate and Water Resources ; Botswanan Sector
A. Cashman	Communication and Stakeholder Consultation ; Botswana and Namibia
F. Becker	Water Demand, Supply and Resource Development; Namibia and Botswana
R. Harris	The Application of Remote Sensing and GIS Technology
S. Simmonds	Soil Studies ; Namibia and Botswana
B. Curtis	Aquatic Invertebrates (Namibian Sector) and Water-borne Diseases of the Okavango River Basin
C. Hines	The Biophysical and Human Environment ; Namibian Sector
M. Murray-Hudson/D. Parry	Biophysical Environment ; Botswanan Sector
M. Murray	Fauna of the Okavango River ; Botswana
P. Warmeant	A Review of Water Chemistry and Water Quality in the Okavango Delta

## **Annex VIII: Public Involvement Plan Summary**

### **Introduction**

A key goal of the Preparatory Assessment Study was to Establish Co-ordination and Consultation Mechanisms – that is to establish channels of communication for the further effective co-ordination, consultation and co-operation between stakeholders. This will facilitate stakeholder participation in the Environmental Assessment and towards the development of a Strategic Action Plan.

One of the first tasks was the identification of stakeholders. Stakeholders were broadly defined as those parties which have a perceived interest in what happens in and to the Okavango River Basin as well as those who would be affected directly or indirectly by developments. Stakeholders were identified either through knowledge and experience of the region or through consultation with various parties.

While this goal was largely achieved in Botswana and Namibia, progress within Angola was limited, and it is clear that the consultative process will still have to be properly initiated within Angola.

### **THE NEED FOR PUBLIC CONSULTATION AND PARTICIPATION**

During the public meetings with traditional and regional leaders and communities held during the Preparatory Assessment the desire to be kept informed was strongly expressed. This is the clearest possible expression of interest in being involved from the grass roots level and communities will be involved in refining the outline SAP through consultative public meetings, reviews and seminars. In this regard, special emphasis must be given to activities in Angola. This process is at the core of the design of the alternative course of action and the achievement of global environmental objectives.

The scope of the communication and consultation component during preparation of the Strategic Action Plan and during its implementation should not be underestimated, especially when it comes to involving communities and interest groups. These are key players in the process and much of the success of the exercise will depend on them as much as on the efforts of government and specialists. In this regard it is considered important that education is incorporated into communication. Attitudes and practices can be changed through education and it is through this that an integrated basin management plan can best and most successfully be implemented.

Consultation will include the involvement of interested and affected parties from the development of the terms of reference of individual study modules, through the selection of specialists, the management and the review of their work.

Workshops and interviews of key informants will have to be the principal means of communication. A balance between involving the general public and those who represent

particular interest groups will need to be struck. Overall this the process of consultation and communication must be seen as being constructive and transparent by all parties involved. The effort required to achieve this should not be underestimated and it is likely to generate a considerable amount of work.

## **WORK REQUIRED**

The work that needs to be carried out with respect to Stakeholder Consultation and Participation falls into three components.

1. A high intensity effort during the first 3 to 6 months of the project to initiate the process in Angola and further extend it in Namibia and Botswana during which time the main points arising can be incorporated into the outline Strategic Action Plan.
2. A continuing effort in which the main aim will be to maximise interest and input from all stakeholders.
3. Presentation and discussion of a final SAP

### **Component 1**

The main activities will comprise:

- Drawing up of publicity material and dissemination to all stakeholders, both locally, regionally and internationally
- Workshops/meetings with :
  - i) Government
  - ii) Local government and Community leaders, including teaching community
  - iii) Public meetings
  - iv) Meeting with appropriate NGOs and groups interested in having an input to the Strategic Action Plan and/or participation in the Environmental Assessment and Integrated management Plan
  - v) Meetings with the scientific and technical community to review the TDA, its specialist inputs and other relevant studies
- Registering of all issues, concerns and ideas. Formulation of a preliminary draft elaborated Strategic Action Plan will follow from these meetings and workshops.

The final step in the Start-up Phase of the consultation process will be the presentation of the detailed activities to be undertaken during the three year period, the laying down of mechanisms for feedback and the definition of targets for the final SAP.

### **Component 2. During the SAP Formulation**

- Regular Meetings with those actively involved in the work. Such meetings will be both informal and informal and will involve members of the PMU, national specialists, NGOs and other groups who are playing a part in the implementation of the Strategic Action Plan.
- Bi-annual workshops should be held, open to all the stakeholders in order to keep everybody informed with the progress of the project.

- The existing website on the internet should be continued and expanded, and continually updated with feedback from the ongoing research and the feedback on the outcomes of the various meetings and workshops.

**Education:** The implementation of an education programme will be extremely important. It is recognised that this is an indispensable tool in the implementation of the project. A programme providing the necessary background for a good understanding of the Okavango River basin should be worked into the school curricula in the region. If this can not be done in formal way it could be achieved in the form of school projects or similar approach. In this way school-leavers will be a position to participate more effectively in the stewardship of the river basin. The collection of rainfall and other useful data by volunteers should be promoted and the project could consider employing a certain number of school leavers from the region who would be tasked to assist the various specialists in their work especially where data gathering is concerned. School leavers would have to receive training and this would have to be incorporated into the brief of the specialists and researchers. They could also assist with providing feedback to local communities as well as liaising with schools.

A certain number of bursaries could be made available to the most able of the school leavers to enable them to study further. It is also proposed that a small number of suitably qualified graduates, preferably from the region, could be employed alongside the school leavers in order to strengthen the capabilities.

This approach is strongly recommended and should be considered as a priority. Previous experience has shown that this type of project can often attract funding for PhD and post-graduate studies, and this sort of support should encouraged, but not at the expense of the education of the grass root stakeholders.

### **Component 3. Presentation and discussion of a final SAP**

It will be necessary and advisable to present the draft final SAP at a number of Public workshops. This would best be achieved through a number of steps within a relatively short period :

- i) Workshop for key members of the technical team.
- ii) Presentation to OBSC
- iii) Public Presentation and Discussion

At this stage it would be possible to finalise the documents for endorsement by OKACOM.

**Annexe IX: GEF Operational Focal Point Letters of Endorsement**

**Annex X: OKACOM Agreement**