



PROJECT DEVELOPMENT FACILITY
REQUEST FOR PIPELINE ENTRY
AND PDF BLOCK B APPROVAL

AGENCY'S PROJECT ID: 3243

GEFSEC PROJECT ID: 2701

COUNTRY: Botswana, Lesotho, Namibia, and South Africa

PROJECT TITLE: Development and Implementation of the Strategic Action Programme for the Orange-Senqu River Basin

PROJECT EXECUTING AGENCY (IES):

UN Agency: UNOPS

DURATION:

Phase 1: TDA Preparation/ PDF B 18 months

Phase 2: SAP Preparation 4 Years

Phase 3: SAP Implementation 5 Years

GEF FOCAL AREA: International Waters

GEF OPERATIONAL PROGRAM:

OP 9: Integrated Land and Water Management

GEF STRATEGIC PRIORITY:

IW Strategic Priority 2

ESTIMATED STARTING DATE: June 2005

ESTIMATED WP ENTRY DATE: January 2007

PIPELINE ENTRY DATE: February 2005

FINANCING PLAN (US\$)

GEF ALLOCATION

Project (estimated)	US\$ 6,000,000
Project Co-financing (estimated)	US\$ 33,000,000
PDF A	
PDF B	US \$700,000
PDF C	
Sub-Total GEF PDF	
PDF Co-financing (details provided in Part II, Section E- Budget)	
GEF Agency	
National Contribution	US \$ 475,000 (in-kind)
Others (ORASECOM, FGFEF, GTZ, EU)	US \$ 2,400,000 (cash/in-kind)
Sub-Total PDF Co-financing	US\$2,875,000
Total PDF Project Financing	US\$ 3,575,000

RECORD OF ENDORSEMENT ON BEHALF OF THE GOVERNMENT:

ORASECOM: (on behalf of Member Countries): Mr Balisi Khupe, Standing Chairperson

Date: 18/01/2005

Botswana: M. Nchunga, Executive Secretary, National Conservation Strategy Agency Date: 01/02/2005

Lesotho: Stanley M. Damane, Ministry of Tourism, Environment and Culture Date: 27/01/2005

Namibia: Teofilus Nghitila, Director: Environmental Affairs, Ministry of Environment and Tourism Date: 18/01/2005

South Africa: Dr. C. Olver, Director General, Department of Environmental Affairs and Tourism Date: 31/01/2005

This proposal has been prepared in accordance with GEF policies and procedures and meets the standards of the GEF Project Review Criteria for approval

Name & Signature

Frank Pinto

Executive Coordinator, UNDP/GEF

Date: 10 March 2005

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ABBREVIATIONS AND ACRONYMS

ARB- Botswana	Agricultural Resources Board
BCLME	Benguela Current Large Marine Ecosystem Programme
CMA	Catchment Management Authority
CEPF	Critical Ecosystem Partnership Fund
DCPF-Botswana	Department of Crop Production and Forestry
DDC-Botswana	District Development Committee
DDP- Botswana	District Development Plan
DEAT-SA	Department of Environmental Affairs and Tourism
DWA- Botswana	Department of Water Affairs
DWAF-SA	Department of Water Affairs and Forestry
EIA	Environmental Impact Assessment
EIA	Environmental Impact Assessment
EWT	Endangered Wildlife Trust
GEF	Global Environment Facility
GIS	Geographic Information System
GoB	Government of Botswana
GoSA	Government of South Africa
LHWP	Lesotho Highlands Water Project
LORMS	Lower Orange River Management Study
MAWRD- Namibia	Ministry of Agriculture, Water and Rural Development
MDG	Millennium Development Goal
MET-Namibia	Ministry of Environment and Tourism
MEWT-Botswana	Ministry of Environment, Wildlife and Tourism
MLRR-Namibia	Ministry of Lands, Rehabilitation and Resettlement
MoA- Botswana	Ministry of Agriculture
NACOMA	Namib Coast Biodiversity Conservation and Management Project
NCSA- Botswana	National Conservation Strategy (Coordinating) Agency
NEMA-SA	National Environmental Management Act
NPC	National Planning Commission
NWSP	National Wetland Strategy And Policy
NWRMR	Namibian Water Resources Management Review
ORASECOM	Orange-Senqu River Basin Commission
PDF B	Project Development Facility Block B
PMU	Project Management Unit
PSC	Project Steering Committee
SADC	Southern African Development Community
SAP	GEF Strategic Action Program
TDA	GEF Transboundary Diagnostic Analysis
UNDP	United Nations Development Program
UNEP	United Nations Environment Programme
WMA	Water Management Area
WB	World Bank
WSSD	World Summit on Sustainable Development

LETTER OF ENDORSEMENT FROM ORASECOM



Sharing the Water Resources of the Orange-Senqu River Basin

Enquiries: Tel: + 267 3603456
Reference: IWORASECOM/3C II

Mr. Leonard Good
Chief Executive Officer
Global Environment Facility
GEF Secretariat
1818 H. Street, NW
Washington, DC 20433 USA

Date Received	19 JAN 2005
File No.	
Project Title	
Client	
Date:	18 th January, 2005

Dear Mr. Good,

**ENDORSEMENT LETTER – GEF PROJECT: IMPLEMENTATION OF THE
STRATEGIC ACTION PROGRAMME FOR THE ORANGE-SENQU RIVER BASIN
(PDF-B)**

1. The Orange-Senqu River Commission (ORASECOM) decided at its meeting on 15 May 2004 in Pretoria, South Africa, to seek GEF support to finance the incremental costs of an environmental management project on the Orange-Senqu River, complementing the baseline activities of the four riparian countries. With UNDP support, ORASECOM has developed a concept note for GEF funding, meeting the requirements of the GEF focus area on integrated land and water management.
2. At its meeting in Gaborone, Botswana on 17-November 2004, the Commission reviewed and endorsed the above project concept. The proposal addresses issues that ORASECOM deems highly important to achieve sustainable management of the Orange-Senqu River basin within the framework of the objectives of the Southern African Development Community (SADC).
3. The Orange-Senqu River is an internationally important watershed in Southern Africa and faces many threats at the transboundary level. The proposed project will assist both ORASECOM and all the riparian countries to improve the management of the shared water resources in the basin by following an integrated water resource management approach.

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4. The Commission would like to request that the GEF include the proposed project in its pipeline as a concept under the International Waters focus area, with UNDP as the designated GEF implementing Agency.
5. I would gratefully appreciate it, if you could facilitate the approval of funding for the project.

Yours faithfully,



Basist Bernard Khupe
STANDING CHAIRPERSON OF THE ORASECOM AND
CO-CHAIRPERSON: BOTSWANA

- CC: Co-chairperson South Africa
Co-chairperson Lesotho
Co-chairperson Namibia
Ms Scholastica Kimaryo, Resident Representative, UNDP South Africa
Mr Ernest Fausther, Resident Representative of, UNDP Lesotho
Mr. Simon R. Nhongo, Resident Representative, UNDP Namibia
Mr. Bjoern Foerde, Resident Representative, UNDP Botswana
Mr. Nik Sekhran, Regional Coordinator, UNDP/GEF Pretoria

TABLE OF CONTENTS

PART I – PROJECT CONCEPT	6
A. SUMMARY	6
B. COUNTRY OWNERSHIP	7
B1. Country eligibility	7
B2. Country drivenness.....	7
C. PROGRAM AND POLICY CONFORMITY	14
C1. Program Designation and Conformity	14
C2. Project Design	15
Main Project Components:.....	25
C3. Sustainability	29
C4. Replicability	29
C5. Stakeholder involvement/intended beneficiaries	30
D. FINANCING	33
D1. Financing Plan.....	33
D2. Co-financing	33
E. INSTITUTIONAL COORDINATION AND SUPPORT	33
E1. Core commitments and Linkages (Linkages to IAs).....	33
E2. Consultations, Coordination and Collaboration between and among Implementing Agencies, Executing Agencies, and the GEF Secretariat	34
E3. Implementation/Execution Arrangements.....	36
PART II – PROJECT DEVELOPMENT FACILITY	36
A. DESCRIPTION OF PROPOSED PDF B ACTIVITIES	36
B. PDF BLOCK B OUTPUTS	38
C. JUSTIFICATION	38
D. TIMETABLE	39
E. BUDGET	39
ANNEX 1 - MAP OF THE ORANGE SENQUI RIVER BASIN	40
ANNEX 2 - MATRIX OF THREATS, ROOT CAUSES AND SOLUTIONS	41
ANNEX 3 – SELECTED REFERENCES	43

PART I – PROJECT CONCEPT

A. SUMMARY

1. The Orange River, (called the Senqu River in Lesotho), originates in the Lesotho Highlands some 3,300 m above sea level where the average annual precipitation can exceed 1,800 mm, with a corresponding average annual potential evaporation of 1,100 mm. The river stretches 2,300 km from the source to its mouth (Alexander Bay/Oranjemund) on the South Africa/ Namibia border, where the average annual precipitation drops to below 50 mm, while the average annual potential evaporation rises to over 3,000 mm. The Orange River basin is the largest river basin in southern Africa, with a total catchment area in the order of 1,000,000 km², of which almost 600,000 km² lies within the Republic of South Africa with the remainder in Lesotho, Botswana and Namibia. The effective catchment area is difficult to determine, since it includes many pan areas and also several large ephemeral tributaries, such as the Molopo and Nossob in Botswana, that rarely contribute to flows in the main river. The principal anthropogenic threats¹ to the integrity of the basin include:

- Over-extraction of water leading to water scarcity;
- Land degradation, diminishing the water retention capacity of soils;
- Pollution; and
- Climate change, expected to lead to greater environmental variability in future (e.g dislocations in spatial and temporal rainfall patterns).

2. The overall goal of the Project is to improve the management of the Orange Basin's trans-boundary water resources through Integrated Water Resource Management (IWRM) approaches that remediate threats and root causes. An IWRM approach considers the interrelationships between natural resource systems, biophysical processes and socio-economic systems and objectives. IWRM seeks to integrate this approach into management of the overall water resource, taking into account factors outside of the water sector such as, for example, agriculture and energy and such issues as land degradation and climate change. This expanded approach makes possible a transition to adaptive management strategies for water resources. The Project will develop mechanisms to ensure the cooperative and sustainable use of the land and water resources of the Orange River Basin; develop regionally based and agreed upon short, medium, and long term management objectives and strategies for the river basin; build capacity for adaptive management approaches to river basin management; develop and implement measures to sustain and enhance overall environmental health within the basin; create a comprehensive stakeholder involvement program; and strengthen regionally based institutions, particularly ORASECOM, to ensure the long term sustainability of interventions. The Project will create synergies with and build upon a range of initiatives being undertaken in the Basin by the four countries and those of donor bodies.

3. The focus of GEF involvement will be on addressing transboundary water management issues, as identified in priority sequence through a transboundary diagnostic analysis (TDA) process, and addressed in a Strategic Action Program (SAP). GEF funding will be drawn upon for preparation of the comprehensive TDA and SAP, and the implementation of select interventions identified in the SAP as regional priorities. The Project meets eligibility requirements under Operational Program #9 of the GEF International Waters Focal Area: Integrated Land and Water.

¹ The extent of a possible fifth threat to the system, the introduction of invasive species, will be explored during Preparation and formulation of the TDA and SAP.

B. COUNTRY OWNERSHIP

B1. Country eligibility

4. As recipients of UNDP technical assistance, all riparian countries in the Orange River Basin are eligible for GEF funding under para. 9 (b) of the GEF Instrument.

B2. Country drivenness

Country Commitment at Regional Level

5. The countries singly and jointly are strongly committed to a regional approach to addressing threats to the shared water resources of the basin. Each of the countries has in place, is developing, and continues to improve upon domestic legislation that provides a framework for regional cooperation in the arena of Integrated Water Resource Management. This is given further substance in bilateral and regional agreements between the riparian countries. In addition, the countries have formed regionally based institutions that provide a basis for management cooperation.

6. Management of the transboundary water resources of the Orange – Senqu River Basin will be a complex undertaking, requiring attention to a host of interrelated issues: water supply and quality, water demand from different sectors, potential conflict between and among users at a national level, water allocation decisions, water pollution, environmental protection, climate change, land degradation, invasive alien species, and potential conflicts between users. As the countries that share the basin – Botswana, Lesotho, Namibia and South Africa - will soon be faced with greater demand for the Basin’s water resources than supplies can provide², it is in their direct best interests to continue and to build upon their commitment to take cooperative approaches to management of Basin resources. The countries have signaled their intention to work together in the following areas, amongst others: developing joint adaptive management strategies codified in regional action plans; ensuring policy concordance to promote water conservation and maximize current, available supplies of surface fresh water flows; strengthening institutional capacity for cooperative water resource management; developing a basin wide information system to establish a common understanding of management issues; operationalizing specific, prioritized technical projects and studies to expand know-how; and developing a multi-sector stakeholder participation framework.

7. Each of the participating countries is an active and committed member of the Orange-Senqu River Basin Commission (ORASECOM), a legal entity charged with overall management of the Basin. The countries are also members of other Commissions charged with management responsibilities in various parts of Basin. These include the Joint Permanent Technical Committee involving South Africa and Botswana (JPTC), the Lesotho Highlands Water Commission (South Africa and Lesotho -LHWC), the Permanent Water Commission involving Namibia and South Africa, and the Joint Permanent Water Commission established by Botswana and Namibia (JPWC).

8. The participating countries are members of the SADC and the SADC Environment and Land Management Sector Coordinating Committee Unit (ELMS), and are signatories to the Protocol on

² Indeed, a recent study undertaken by the Lower Orange Management Study (LORMS) has estimated that surface water supplies of the Orange –Senqu River Basin system may only be capable of meeting requirements for present and future predictable uses until sometime between 2010 and 2015.

Shared Watercourse Systems in the Southern African Development Community Region (Protocol). Of importance to GEF Projects in the SADC region is the Protocol's emphasis on the requirement of Member States to "...maintain a proper balance between resource development for a higher standard of living for their peoples and conservation and enhancement of the environment to promote sustainable development."³ The Protocol also provides, a framework for the establishment of river basin management institutions (Article 3, a reason for the creation of ORASECOM)), objectives for basin management institutions (Article 4), functions of basin management institutions (Article 5), and a financial and regulatory framework for basin management institutions (Article 6).

9. The participating countries are also supportive of the Southern Africa Vision for Water, Life & the Environment in the 21st Century (Vision). The Vision states, *inter alia*, that there is:

- An increasing demand on water resources;
- An increasing strain on both water resources and the infrastructure necessary to sustain an urban environment;
- Increasing poverty;
- Widespread food insecurity;
- Inadequate coverage of water and sanitation services;
- Disease and premature death from water related illness;
- A need for integrated water resources and management (IWRM);
- Poor waste management and lack of accountability;
- Low levels of energy supply;
- Degraded watersheds; and
- Constraints within water management institutions.

At Country Level

Botswana

10. Water availability in Botswana is mostly a function of erratic rainfall patterns⁴. Due to prevailing, extremely arid conditions, it is estimated that up to 80% of precipitation is lost to evaporation. Only 2% constitutes surface runoff, and a meager 1% reaches the groundwater table. The balance, 17%, is utilized for biomass generation and is productively lost through evapotranspiration. Thus the internal water resources of Botswana are ephemeral in nature, and comprise the impoundment of summer rainfall surface runoff in the normally dry rivers, groundwater and the utilization of unconventional water resources. Although the limited surface water resources may seem attractive for reservoir development, the efficiency of dams would be very low because the largely ephemeral river flows are too variable, the topography too flat for good dam sites, and evaporation is so high. Groundwater is the source of freshwater for approximately 80% of the population and for livestock. The long-term sustainable yield for groundwater resources is estimated to be 200 cubic Mm/a, of which 130 cubic Mm/a have been developed. Wastewater re-use is a potential source of supplies as demand increases, as is a focus on demand side regulation.

11. The domestic livestock, mining and power, and agricultural sectors constitute the main users of water in Botswana. With continued population growth and related development activities, the

³ SADC Protocol, Article 2, Section 3.

⁴ SADC Water Sector/GTZ, Regional Strategic Action Plan 9 and 10, Botswana Water Policy Review, 30 June, 2003.

demand for water will continue to rise. Indeed, the Water Utilities Corporation has recorded an annual average increase of 6% in urban water demand. It is expected that water demand will more than double over the next 15-20 years, and that this increase in demand will eventually outstrip currently available water resources. In summary, Botswana's water resources are under a high level of stress, and water scarcity will be an increasing, limiting factor in its ability to meet future demand. Given this increased stress on Botswana's already limited supplies of water, issues related to the area of Botswana that is within the Orange River Basin are of great national concern.

12. Botswana has addressed, in part, its growing water scarcity concerns through adoption of the Botswana National Water Master Plan Study (Plan). Although the Plan is now over a decade old, it has been revised and adjusted over time. The Plan places an emphasis on the following activities:

- close monitoring of groundwater wellfields to avoid excessive depletion. In cases where the rate of extraction is greater than the rate of replenishment, alternative water resources must be found;
- ensuring greater use of alternative technologies, such as desalination, to develop and conserve water resources;
- management and the development of water supplies by local communities;
- ensuring greater coordination between Government institutions in the planning and development of water resources;
- requiring environmental impact statements (EIS) as an integral part of all project feasibility and subsequent studies for water development projects; and
- building interconnecting water supply schemes as a measure to respond to drought.

13. Botswana realizes that augmentation of its internal water resources through the utilization of internationally shared supplies (border-rivers and perhaps transboundary aquifers) will become extremely important over the next decade. An International Water Unit has been established within the Ministry of Natural Resources to provide technical support for the management of shared river basins. The Unit represents Botswana at meetings pertinent to the Orange River Basin – ORASECOM, the JPTC, and the JPWC - as participants in water related fora created by SADC.

Namibia

14. As is the case with Botswana, an extremely arid hydroclimate results in an immediate loss of approximately 83% of precipitation to evaporation. Only two percent of rainfall supplies end up as surface run-off and a mere 1 % becomes available in the groundwater table. The balance, 14%, is utilized for biomass generation and is productively lost through evapo-transpiration. According to a Study undertaken by SADC and the GTZ⁵, the water resources of Namibia can be divided into two categories – internationally shared resources and internal water resources. The international water resources are situated along the northern and southern perennial border rivers. In the north are the perennial Curoene, Okavango, and Zambesi Rivers, as well as the ephemeral Cuvelai System that drains from the south of Angola into the Etosha Basin. In the south is the Orange River. The internal water resources of Namibia are also ephemeral in nature and comprise the impoundment of summer rainfall surface runoff in normally dry rivers, in groundwater, and the utilization of unconventional water resources. It is estimated that 95% of the assured safe yield of the dams that can be developed on these ephemeral systems is about 200 cubic Mm/a, and of this approximately 90 cubic Mm/a

⁵ SADC/GTZ, Namibia Water Policy, Pieter Heyns, 30 June, 2003

have been developed. It is also estimated that the long-term sustainable yield of groundwater resources is 300 cubic Mm/a, and of this yield about 150 cubic Mm/a have so far been developed.

15. In order to increase available water resources, Namibia maximizes the extent to which wastewater is recycled, or reclaimed, and has developed desalinization technology for brackish and seawater. These processes yield approximately 10 cubic Mm/a, and, while this is a relatively small amount of water, it yields a significant impact at the household level. For example, in Windhoek, where a sewage reclamation plant that has been in operation since 1969, the present capacity is 7.5 cubic Mm/a. Nonetheless, Namibia has a high level of water stress and absolute water scarcity, and in future it is likely that Namibia will look to international water resources to meet water demands.

16. The main body of law directly concerned with water resources in Namibia comprises four acts, some of which have been subsequently modified by short amending acts. These include the:

- Water Act, 1968;
- Borehole Act, 1956;
- Waterworks Act, 1962;
- Waterworks Amendment Act, 1983;
- Water Utilities Corporation (WUC) Act, 1970; and the
- WUC Amendment Act, 1978

17. Aside from the acts listed above, there are other measures that have a bearing on water. The Public Health Act, for instance, gives environmental health officers power to ensure the purity of public water supplies. The Local Government District Councils Act enables District Councils to provide water supplies outside any areas for which a water authority has been appointed under the Waterworks Act. The Aquatic Weeds Control Act of 1971 prohibits the importation or transportation of undesirable aquatic weeds into the country or from one body of water to another without permit. The provisions of the principal acts are summarized below.

- The Water Act, 1968 is the base statute and contains what might be termed the “common law” aspects of water: the status of public water; the inherent rights of individuals to the use of water; the recording, granting, variation, and termination of formal rights to use or impound water or to discharge effluents into it; the obligations of those taking water to use it properly; conditions controlling pollution of public water, and so on. This act established the Water Apportionment Board (WAB) as the licensing authority and prescribed its constitution, powers, and duties. The Secretariat for the WAB is provided by the DWA.
- The Borehole Act, 1956 is a short statute which stipulates the records and samples which have to be kept and furnished to the Director of the Department of Geological Survey (DGS) by anyone sinking a borehole more than 15 m below the surface or deepening an existing borehole. Contractors engaged in drilling operations on behalf of clients are required to comply with the provisions of the act.
- The Waterworks Act (Act), 1962 and its short amendment provide for the constitution of water authorities in townships and other areas designated by the “Minister” and confer powers and duties upon them. Included among these is the right to acquire existing waterworks; construct new works; and curtail supplies in time of drought and other emergencies. The Act and amendment also deal with charges for water supplied, water supplied to non-statutory areas, and the misuse or pollution of water. Further, they authorize the “Minister” to make regulations on such matters as the prevention of waste, suspension of supplies, and the inspection and

testing of meters and other appurtenances.

- The Water Utilities Corporation Act, 1970 established the Water Utilities Corporation for the supply and distribution of water within the Shashe Development Area and elsewhere. The Act also conferred necessary powers to the WUC to develop water resources. The Act specifically addresses the constitution of the corporation, the appointment of members, procedures, powers, the acquisition of capital works, and other matters. The financial principles and methods of charging for water that must be observed are also specified. The Act further provides that the Corporation shall be the “Water Authority” for the purpose of the Waterworks Act so that all the provisions of the latter act apply to the WUC.

18. The Namibian Water Resources Management Review (NWRMR) was an institutional reform process initiated in 1997, within the Ministry of Agriculture, Water and Rural Development (MAWRD), and supported by the World Bank, BMZ/GTZ and UNDP. An objective of NWRMR was to create a more effective and appropriate institutional structure for the Water Sector. It reflects the decentralization policy of the Government. Many issues such as strategic water resources assessment, human resources development, regulation, and conflict regulation were considered.

19. Broad sectoral objectives, as stipulated in the *Water and Sanitation Policy* of 1993, include:

- that essential water supply and sanitation services should become available to all Namibians, and should be accessible at a cost that is affordable to the country as a whole;
- that equitable improvement of services should be achieved by the combined efforts of the government and the beneficiaries, based on community involvement, community participation and the acceptance of mutual responsibility; and
- that communities should have the right, with due regard for environmental needs and the resources available, to determine which solutions and service levels are acceptable to them. Beneficiaries should contribute toward the cost of services at increasing rates for standards of living exceeding the levels required for providing basic needs.

20. A new water policy was approved in August of 2000, and a Draft Water Bill is presently being considered at Cabinet level and is in the final stages of legal review.

Lesotho

21. Lesotho has an average rainfall of about 760 mm per year⁶, below the world average of 860 mm per year. Rainfall varies from less than 300 mm per year in the western lowlands to more than 1600 mm per year in the northeastern highlands. About 85% of the rainfall is received in the period October to April. Very intense storms occur especially in the lowlands and as much as 15% of annual rainfall may occur in a 24-hour period in some areas. Lesotho’s surface water resources are estimated at between 4,730 Mm³ and 5,300 Mm³ per year. The major river systems are:

- The Senqu (Orange) River with a catchment area of 24,485 km² (66% of Lesotho’s land area).
- The Makhaleng River with a catchment area of 2,911 km².
- The Mohokare River (Caledon) with a catchment area of 6,890 km² (within Lesotho).

22. Lesotho’s groundwater resources are conservatively estimated at 500 Mm³ per year.

⁶ SADC/GTZ Water Sector, RSAP Projects 9 and 10, Lesotho Water Policy Review, 30 June, 2003.

Aquifer yields are generally low. The rural population in the lowlands is dependent on wells (typical depth 65m) fitted with hand pumps. Total water requirements in 2025 are predicted to be in the order of 130 to 160 Mm³/a. Future water demand is sensitive to population movements and growth (as impacted particularly by HIV/Aids), industrial/trade policies (particularly as related to the American Growth and Opportunity Act), and estimated growth in irrigation demand. Water demand forecasts for the Lowlands area (where population, industry and agriculture are concentrated) are in the process of being revised. The current cultivated area is approximately 210,000 ha (7% of total land area). However, there is limited irrigation potential and the current irrigated area is in the region of 2,500 to 3,500 ha. The major crops are maize, potatoes and other vegetables.

23. Water availability per capita (based on internally renewable fresh water resources) is estimated at about 2,400 cubic meters per capita and hence Lesotho is not, by this definition, water stressed. However, water resources are unevenly distributed both geographically and temporally. The concentration of population and industry is not co-incident with the availability of large quantities of water. Transfer schemes to provide water from water abundant areas to the lowlands are expensive. Nevertheless, the feasibility of a transfer scheme linked to the Phase 1 Lesotho Highlands Water Project is being investigated together with other options. In the short term, the water supply to Maseru is vulnerable to drought, and the possibility of releases from the Lesotho Highland Water Project (LHWP) at Muela as a contingency plan (for emergencies and on a time-limited basis) to augment flow in the Mohokare River has been raised by the World Bank, which recommended that this be discussed with South Africa. (At present, South Africa does not need its full allocation of water from the LHWP due to lower than forecasted demand in Gauteng.)

24. Lesotho has recently developed an Environment Act (Act)⁷. The Act makes provision for the establishment of the Lesotho Environment Authority, and provision is made for the systematization of EIA procedures, development of Standards (in particular Water Quality), and new procedures for Effluent Discharge Licensing and Polluting Licensing. The Act is also an “umbrella” for many issues related to water and is pertinent to the Outcomes and Activities of this proposal.

25. A new water resources policy (Policy) was approved by Cabinet in 1999. The objectives of the Policy are to ensure sustainable development of water resources, adequate supplies of potable water, even in drought conditions, and the proper assessment and protection of water resources. The Policy is comprised of six key provisions:

- Government will ensure rational exploitation and management of Lesotho’s water resources.
- Government will ensure access to potable water by all people of Lesotho.
- Every citizen is entitled to potable water for basic human needs and any requirement beyond this will be paid for by the user.
- All environmental aspects of water will be protected.
- Water will be managed in a way that ensures maximum benefits to Lesotho while taking cognizance of her obligations to her neighbors and downstream users.
- Stakeholders will be involved in every stage of design and implementation of water

⁷ Environment Act n°103 of 2001

resources development projects. The expansion of water supply systems will also be demand driven.

26. The Lesotho Highlands Water Project (LHWP) is a key element of Lesotho's transboundary water resource management programme. The LWHP is a four-phase water transfer project which involves diverting about half the water flowing down the Senqu River in Lesotho into the Vaal River system to meet increasing needs in this heavily industrialized corridor which contains approximately 40 % of South Africa's population. Phase 1B of the project became operational in 1998, with the transfer of water from a network of reservoirs in the Lesotho Highlands. The project has been extended to include the construction of another tunnel from the Katse reservoir. Following completion of Phase 1B, the supply of water to the Vaal dam from the project was boosted by 180 million cubic meters to 780 million cubic meters. The Vaal dam currently supplies 1200 million cubic meters of water to Guateng Province (Johannesburg and Pretoria). In return, Lesotho receives R200 million per annum from South Africa in royalties. Water is Lesotho's greatest source of foreign exchange. By the end of the fourth phase of the LHWP in 2015, six dams will have been constructed, including a 200 km network of transfer tunnels, delivering 82 cubic meters of water per second.

27. Lesotho is actively involved in regional level efforts in the Orange River Basin by virtue of its membership in the Lesotho Highlands Water Commission, supported by a joint permanent technical committee, and the Lesotho Highlands Development Authority. It is a member of ORASECOM and, with South Africa, has established a working committee for the Lesotho lowlands.

South Africa

28. South Africa's rivers are small by comparison to those of many other countries⁸. South Africa's portion of the Orange River carries only about 10% of the volume of water that is carried by the Zambesi River, and a mere 1% of the volume carried by the Congo. Further, many of South Africa's larger rivers, such as the greater Orange-Senqu and Limpopo Rivers, are international resources. Eleven of the nineteen water management areas in South Africa are facing a water deficit, a "deficit" being defined as water requirements being in excess of water availability. South Africa is dependent on surface water resources for most of its urban, industrial and irrigation needs. Groundwater resources, while also extensively used, particularly in rural areas, are limited by South Africa's geology (aquifers occur in a limited number of areas). In the northern parts of the country, both surface and groundwater resources are nearly fully developed and utilized. In order to meet future water requirements, water resources must be utilized to maximum effect. Growing industrialization and urbanization will place further demands on water resources unless corrective measures are taken. The Department of Water Affairs and Forestry (DWAF) is consequently developing an extensive water conservation and water demand management program to ensure the most beneficial uses of water in the country, both from a social and economic perspective, including the re-allocation of water from low benefit to higher benefit uses over time.

29. The total surface water available in South Africa averages 49,200 million cubic meters per year, including about 4,800 million cubic meters of water originating from Lesotho, and

⁸ SADC/GTZ South Africa Water Sector Review, 30 June, 2003.

approximately 700 million cubic meters originating from Swaziland. The total currently available yield is 13,911 million cubic meters, which could be increased by 5,600 million cubic meters through development of additional surface water schemes. Substantial increases could also be realized through increased re-use of return flows, and potential also exists for additional development of groundwater resources, although at smaller scale. Over the next twenty-five years water use is expected to rise 9%. HIV/AIDS is expected to have a significant affect on population growth and future water demand, which is also the case for the other countries sharing the basin.

30. South Africa completely reformed its water law after the democratic elections held in 1994. This resulted in the enactment of the Water Services Act (Act 108 - of 1997) and the National Water Act (Act 36 of 1998). The legislation is "framework legislation" with most of the detail being incorporated in subsequent regulations. Since legislative enactment, DWAF has focused its efforts on implementation. In particular, Catchment Management Agencies (CMAs) are being established for each of the 19 Water Management Areas (WMAs) defined in the country (Chapter 7 of the Water Act). Given the size of the river basins in RSA, WMAs are identified at sub-basin level. In the Orange-Senqu River Basin alone, 5 CMAs should be created: Upper Vaal, Middle Vaal, Lower Vaal, Upper Orange, and Lower Orange. Full implementation of the CMAs will likely take many years as the National Water Resources Strategy will determine a framework for the delegation of water resources management responsibility to the CMAs, and CMAs will then, as is suggested above, have to develop water resource management approaches as deemed necessary. Thus activities related to the institution of CMAs are likely to occur in parallel with this project.

31. The National Water Resource Strategy has been developed consistent with Chapter 2 of the Water Act. Chapter 2 states that the Strategy: *“will provide the national framework within which South Africa’s water resources will be protected, used, developed, conserved, managed and controlled. It will indicate, for instance, where water is available for development and for additional irrigation. It will identify where new investment will be needed to meet domestic and municipal needs as well as where difficult choices have to be made – between power stations and new mines for example. It will provide the basis for achieving fair arrangements with neighbours who share our rivers.”*⁹ Consistent with the legislatively mandated requirement “for achieving fair arrangements with neighbours who share our rivers”, South Africa has created an International Liaison Directorate within the Department of Water Affairs and Forestry. As is the case with the other countries participating in this Project, South Africa is a full partner in ORASECOM.

C. PROGRAM AND POLICY CONFORMITY

C1. Program Designation and Conformity

32. The proposed Project is consistent with both OP # 9 (Integrated Land and Water Multiple Focal Area Operational Program), and the International Waters Strategy of the GEF. Specifically, the Project meets each of the Short-term objectives of the Program:

- Addressees the cross-cutting issue of land degradation in Africa;
- Assesses the usefulness of the Strategic Action Program for IW Projects with multiple focal

⁹ Source : Weekly newsletter of the DWAF – 15/02/02

area benefits; and

- Derives lessons learned in testing workable mechanisms to improve community, NGO, stakeholder, and inter-ministerial participation in planning, implementing, and evaluating Projects in OP#9.

Further, the proposed project meets the stated objectives of IW Strategic Priority II: Expand global coverage of foundational capacity building addressing the two key program gaps and support for targeted learning. It will help expand global coverage of foundational capacity building interventions by addressing two key IW program gaps: those of providing a focus on cross-cutting aspects of African transboundary waters, and support for targeted learning. The project addresses the Programme focus on addressing water scarcity/ competing water uses through cross-sectoral intervention.

33. Last, the proposed Project is consistent with the GEF strategy for Adaptation to Climate Change, adopted by the GEF Council in May, 2004. This requires that operational approaches to adaptation should be:

- Designed to maximize the opportunity for learning and capacity building and will be representative of particularly vulnerable regions, sectors, geographic areas, ecosystems, and communities. This meets those objectives by inclusion of clearly stated learning and capacity building activities, and the fact that the target region is vulnerable as demonstrated by initial studies already undertaken within the participating countries and referred to in the proposal.
- Applicable in a wide context, and applied in the larger context through experience and lessons learned. The GEF will use experience from the SPA to develop good practices and estimates of the costs of adaptation to better mainstream adaptation into the full range of GEF activities. The proposed project will commit considerable resources to the dissemination of lessons learned from its focus on climate change and adaptability.
- Inclusive of: (i) activities within a natural resources management context that generate global environmental benefits, and (ii) adaptation measures that provide other major development benefits (e.g. WEHAB, i.e. water, energy, health, agriculture, biodiversity).
- Consistent with existing eligibility criteria for GEF funding, such as country drivenness, ecological and financial sustainability, replicability, stakeholder involvement, M&E, etc. will be applied to the projects submitted under SPA. The proposed Project, as it is being submitted consistent with the requirements of OP# 9, meets these eligibility criteria.

C2. Project Design

34. The Project has been designed with the understanding that the Orange River Basin is an internationally important watershed seriously threatened at many levels, many of them at a transboundary level, the management of which cannot be effectively addressed by a single country. The catchment area is huge, approximately 3% of the African land-mass, and its high value across a range of uses and values makes it a crucially important resource to the participating countries. Governments in the region are committed to improved cooperation as evidenced by the creation of the several international entities previously described in this proposal. However, existing mechanisms to operationalize this commitment are still in the formative stages. The provision of GEF support, linking with the FGEF, which has already approved a US\$ 1.9M. Project for the Orange River Basin, the GTZ, which has supported initial discussions to strengthen the capacity of the ORASECOM, the EU, UNESCO, the countries themselves, and other donors that will be

recruited as part of the GEF project, can close the gap between the stated objectives of the countries, as articulated in the Agreement creating ORASECOM and reality on-the-ground.

Project Context:

Physical Context

35. The Orange River basin is the largest river basin in southern Africa with a total catchment area in the order of 1,000,000 km², of which almost 600,000 km² is within the Republic of South Africa with the remainder in Lesotho, Botswana and Namibia. The effective catchment area is difficult to determine since it includes many pan areas and also several large ephemeral tributaries, such as the Molopo and Nossob in Botswana, that rarely contribute to flows in the main river channel. The average natural runoff from the basin is estimated at 12,000 million m³/a. This represents the average river flow that would occur if the river were free flowing, that is had it not been significantly and heavily developed with the result that the current average annual runoff reaching the river mouth at Alexander Bay is less than half of its natural, historic runoff. As water supplies to the system occur almost exclusively in the summer months, measures to store water for year-round use are required in order to maximize use of the available supplies.

36. The Vanderkloof Dam is the most significant storage structure on the downstream portion of the Orange River and effectively controls the flow of water along the 1,400 km stretch of river between the dam and Alexander Bay on the Atlantic Ocean. The banks of the Orange River downstream of Vanderkloof Dam are heavily developed in many areas, with irrigation being the principal use. Both the Gariep and Vanderkloof dams are used to regulate river flows for irrigation as well as to produce hydro-electricity during peak demand periods. Very little Orange River water is used for domestic or industrial purposes with the exception of that used in the Vaal River basin.

37. The principal tributary of the Orange River is the Vaal and its associated basin, which is not only the largest and most important tributary of the Orange, but ‘fuels’ South Africa’s industrial heartland in the greater Johannesburg-Pretoria region. Approximately fifty percent of South Africa’s GDP is generated in this area, and more than 80% of South Africa’s electricity requirements - approximately 50% of all the electricity generated in Africa - is met through the resources of the Vaal. Water is also supplied from the Vaal to some of the largest gold and platinum mines in the world, as well as to production activities in some of the World’s largest coal reserves. As a result of these and other various catchment developments, flows from the Vaal River rarely make a significant contribution to the flow in the Orange River except during flood events.

Environmental Context:

38. Information on the current state of the environment of the Orange River Basin is incomplete. The substantial, anthropogenic modifications that have so significantly altered the natural flow regimes of the Orange, and its principal tributaries, took place in large measure at a time when environmental values were not significantly factored into development decisions. Further, there was little opportunity given to many stakeholders to comment upon development decisions undertaken centrally, and the potential consequences of these decisions. Thus there is little baseline data and information available upon which to accurately assess the environmental and associated impacts that have taken place throughout the system as a result of human intervention. Notwithstanding this lack

of baseline data and information, at least one comprehensive study of the Basin, undertaken by the World Commission on Dams¹⁰, concludes that three main habitats have been affected as a result of human interventions in the system. These include: dryland habitats lost as a result of land colonization and development along the river, the riverine ecosystem, and the estuary.

39. With regard to *dryland habitats*, development of the river has at least indirectly affected the surrounding lands through what might be called a “knock-on” effect of irrigation schemes, which have led to the loss or degradation of large tracts of indigenous veld. There have also been losses in biodiversity of riparian vegetation along the Orange River¹¹. Such losses appear to be mainly secondary consequences of current river regulation schemes, which led to land clearing for cultivation and set the stage for the introduction of invasive alien species. Several invasive species are of growing concern along the Orange River, these include mesquite (*Prosopis* spp), *Sesbania punicea*, Port Jackson (*Acacia saligna*), castor oil bush (*Ricinus communis*), wild tobacco (*Nicotiana glauco*), cocklebur (*Xanthium* spp), syringe (*Melia azedarach*), and thornapple (*Datura innoxia*).

40. The major changes in *flow regime*¹² are comprised of:

- The quantity of annual runoff through the channel;
- The inter-annual variation of runoff; and
- The marked seasonality of the pre-regulation regime.

41. The Gariep and Van der Kloof dams largely contain floods from the catchment area above Gariep, thus reducing the frequency of small to medium sized floods and cutting the size of maximum floods. Benefits from these dams include:

- Stabilization of the flows within and between years (reduced variability);
- Higher winter flows and lower summer flows;
- Fewer major flood events with influence on geomorphology;
- Loss of smaller flood events that stimulate fish breeding;
- Stabilization of temperature extending 130-180 km below the Van der Kloof dam; and
- Loss of nutrient rich silt to the river mouth and estuary.

42. Another flow regime based effect has to do with the use of the Gariep and Van der Kloof dams for peak power generating capacity, which increases during the winter months. As winter months are also low flow months, hydropower releases create rapid pulses in flow and reverse the natural hydrological regime.

Biodiversity

43. The Orange River Basin is a center of globally significant terrestrial biodiversity, including components of four biomes;

- Temperate grasslands (subdivided into dry and montane grasslands);
- Succulent karoo;
- Nama karoo; and

¹⁰Orange River Development Project, South Africa, Final Report: November 2000.

¹¹Ibid

¹²Ibid

- Arid savannah.

Two of these biomes, the grasslands and succulent karoo, are noted for their high floristic richness and endemism. The grasslands biome is further noted for its hydrological service provisioning capacity, straddling important catchment areas in the headwaters of the Orange River. Land degradation in these areas is a threat to biodiversity and undermines hydrological service functions. With the exception of the montane grasslands these biomes are all considered deserts or semi deserts with unpredictable rainfall patterns (Lovegrove, 1993). The succulent and Nama karoo biomes are highly vulnerable to desertification and are expected to suffer from increased rainfall variability and changes expected as a result of climate change. The succulent karoo, which lies within a winter rainfall area, presently has more predictable rainfall than the other areas. The biodiversity of this area is expected to be severely affected under worst case climate change modeling predictions. However, the exact impacts of climate change on biodiversity and ecological services in the river basin remains poorly understood, and a determination of climate related effects is seen as a priority for this project.

44. The project is expected to benefit biodiversity conservation programs in two ways: 1) by developing capacity to restore degraded ecosystems and strengthen hydrological service capacities, and 2) increase understanding of vulnerabilities to climate change across the river basin, including expected impacts on biodiversity. This information will in turn be important to plan adaptation programs to address threats, including the siting of protected areas in expected refugia for native species.

45. An important area in terms of aquatic biodiversity is the Ramsar site located at the mouth of the Orange River. While changes in flow regimes over time have contributed to degradation of the site¹³, the influence of the regulated river on the avifauna is poorly understood. One effect of regulation upstream of the mouth has been a reduction and increase in reedbeds and reduced flooding of small salt marsh areas. Of greater consequence for the mouth of the river is the effect of regulation on the build-up of sand bars. The sand-bars disrupt the interchange of river water with ocean water, and if closure as a result of sand-bar formation is complete, it can cause the river to back-up, with likely, although largely undefined consequences on the avifauna.

Current Supplies and Usage

46. The joint South African and Namibian Lower Orange River Management Study (LORMS) commenced in 2002 and will soon be completed. The objective has been to investigate ways to improve the management, development and operation of the Orange River to benefit both countries. The study gives a good description of the extent to which current and predictable uses of the waters of the Basin must be the subject of continuing review, and that measures must be taken at the regional level to identify any and all means to ensure more efficient use of the Basin's waters.

47. The water resources and water uses of the whole Orange River Basin have also been assessed through the LORMS study. While the Vaal River System was not studied in any detail, the results of detailed studies recently completed on the Vaal River Basin by South Africa were

¹³ Ibid

used in the LORMS study.

48. The historic firm yield analysis of the current Orange River System, with the environmental water requirements currently being released from Vanderkloof Dam, indicate that the total historic firm yield from the system is in the order of 3,250 million m³/a, and that by 2005 water requirements will be in balance with supplies determined to be available within reasonable assurance levels. Updated preliminary assessments have been made of the environmental water requirements for the Orange River and Estuary, as the current releases from Vanderkloof Dam were determined before current methodologies were available.

49. The Estuary is currently assessed to be an environmental Category D (largely modified), but with a deteriorating trajectory. Various river reaches were assessed to be currently Category D and Category C (moderately modified), also with deteriorating trajectories. To maintain the current environmental categories and prevent further deterioration, additional release would be required for both the river and estuary, and the Estuary requires more water than the river.

50. The water available for allocation to consumptive use is significantly reduced when the updated preliminary environmental flow is provided to the Estuary:

To maintain the Estuary at a Category D:	Surplus yield = 14 million m ³ /a
To improve the Estuary to a Category C:	a deficit of 500 million m ³ /a will be experienced

51. It should be noted that the assessment of environmental water requirements is based on limited data, and that significant monitoring and a more detailed study will be recommended as a result of the LORMS study.

Current and Projected Future Supplies

52. A number of anthropogenic impacts on the estuary would also have to be reversed if the negative trajectory of the estuarine category is to be halted. As previously mentioned, the current and projected future water use in both countries was assessed during the LORMS Study. Particular emphasis was placed on the potential development of irrigation in the common border area in Namibia and South Africa. These opportunities focus on the production of high value crops. Other consumer categories assessed were the urban/industrial and mining sectors.

53. If current and estimated growth in water uses is to be met, further water allocations will be required and new management and development options must be implemented to make the required water available. The options for management and development of the Orange River, with particular emphasis on the Lower Orange, below the Vanderkloof Dam, were considered in three categories and recommendations made. It was recommended that significant improvements be made to the flow-monitoring network and that real time modeling of the Orange River be used so that operational losses could be reduced and inflows from the Vaal be utilized. It is estimated that these improvements would increase yields by approximately 80 million m³/a.

54. At present there is a surplus yield of 105 million m³/a in 2005 available in the Vaal River System, but this would be reduced to 30 million m³/a by 2010. The LORMS study concluded that

this surplus yield should be considered as a strategic reserve to be used to increase the assurance of supply to users in the Orange River until 2010 if required. The yield of the system can be increased by a further 143 million m³ per annum if the water stored in Vanderkloof Dam, below the canal inlets to the irrigation system, is accessed via pumping. A parallel study is being undertaken by the South African Department of Water Affairs and Eskom to determine the amount of energy that Eskom would forfeit as a result of such a change.

55. The LORMS study also concluded that the ongoing initiatives in the urban, industrial, mining, and agricultural sectors should continue and be encouraged. The opportunities are greatest for more efficient water use in the agricultural sector, and this sector also has the largest water use. The most important measures that have been identified include:

- The establishment of a water efficiency unit;
- Proper scheduling of irrigation on farms;
- Metering and application of tariffs to promote conservation; and
- The upgrading of irrigation systems.

56. The current (2002) agricultural water use from the Lower Orange, downstream of Vanderkloof Dam, (excluding the Vaal), is 1 375 million m³/a and it is estimated that up to 20%, i.e., 277 million m³/a could be saved and used for irrigating new areas. It has been recommended that a pilot project be implemented to establish the costs and benefits, which could be achieved by initiatives to improve water use efficiency.

57. The success of water conservation and demand management measures is largely dependent on adequate incentives to farmers, the legislative and administrative regime in South Africa, as well as on significant attention to education and training activities for, and acceptance among numerous private sector irrigators. The estimated time to realize WDM savings, including the time required for the pilot study is approximately 15 years. It has been recommended that no reliance be placed on this water for making new allocations available for development, although some transfers of water rights between different areas may take place within the Orange River System.

58. The provision of a dam on or near the Namibia/South Africa border to re-regulate the releases from Vanderkloof Dam, and the currently uncontrolled run-off from the incremental catchment, can yield about 170 million m³/a. The proposed dam would be near Vioolsdrift, and would be a minimum height of 35 meters with a gross storage capacity of 260 million m³. Considering the projected increase in water requirements and the fact that the currently estimated surpluses are within the accuracies of hydrological assessments, it has been recommended that a detailed Feasibility Study be undertaken as soon as possible. If additional allocatable yield is required after these measures have been implemented, a large storage dam would be required on the Orange River System. Current estimates are that this additional yield will be required after 2025.

59. In the study area of this project, the Vioolsdrift site was evaluated as being clearly more advantageous for a large dam than the alternative site at Boegeberg. The possibility of raising the proposed Vioolsdrift re-regulating dam to provide a large storage dam, or the construction of a dam in the Upper Orange River, such as at Bosberg or Mashai, is still to be evaluated. More detailed analysis of the allocatable yield, outlining different assurances of supply to various water

use sectors, is in progress. Indications are that the existing system may be able to meet projected water requirements until about 2010 or 2015, and the detailed analysis will confirm this date. However, the projections of surplus allocatable water, which vary between 60 and 350 million m³/a, represent less than 10% of the total allocatable yield of the system, and there are a number of uncertainties when making these yield assessments.

Socio-economic Landscape:

60. The livelihoods across the basin are remarkably diverse¹⁴. The varied cultural and socio-economic characteristics of the population have emerged against a backdrop of contrasting biophysical properties. In some cases, rainfall, soil type and vegetation characteristics have influenced the nature of the social and economic systems that were able to evolve in different areas. In other cases the reverse has been true, i.e. where social or economic systems were already strongly intertwined or where opportunities existed to make social or economic gains, inhabitants changed the biophysical environment to suit their needs.

61. The total population of the River Basin is estimated at 9 million. Lesotho's two million inhabitants are composed almost entirely of Basotho people. By contrast the rest of the Gariep Basin's inhabitants represent a range of peoples more likely to be black African or white individuals, less likely to be coloured or Indian, and more likely to speak Isikulu, Sesotho, Setswana, or Afrikaans. Agriculture employs more than half of the basin's population, many of whom reside in rural areas, while a good portion of the remainder is employed in the industrial sector. This rural-urban dichotomy is a prominent feature in the divergent livelihoods of the inhabitants of the basin as well as their use of ecosystem services. Overall the basin's major sectoral areas include those of agriculture, manufacturing, mining, and trade.

Baseline Scenario

62. The natural flow of the Orange River has been reduced by half due to major withdrawals and high evaporation in the 29 existing reservoirs along the river. There are three large storage reservoirs on the Orange River, the Gariep and Vanderkloof Dams on the Orange River inside South Africa, and the Katse Dam in Lesotho on the Senqu River. The Gariep Dam forms the largest reservoir in South Africa with a capacity in excess of 5,000 million m³ while Vanderkloof Dam forms the second largest reservoir with storage capacity of over 3,200 million m³. Although the storage capacity of the Katse reservoir is lower, a comparatively modest 1,950 million m³, it is the highest dam in the Southern Hemisphere with a height of approximately 185 m. above foundation.

63. The accelerating uses of the waters of the Orange River basin are rapidly outstripping the region's *institutional ability* to cope. While there are several Commissions that currently have responsibility for management of the system, and the principal Commission, ORASECOM, is an entity with international legal status, none of the Commissions has a permanent Secretariat and thus there is quite limited capacity to jointly identify and undertake the many anticipatory actions that will be necessary for the countries to effectively and jointly manage this key international resource.

¹⁴ Ecosystem Services in the Gariep Basin. A contribution to the Millenium Assessment, prepared by the Gariep bain team of SAfMA, the South African Millenium Ecosystem Assessment, Stellenbosch University.

64. There is at present *no integrated data and information system* necessary to inform future uses of the Basin's water. The French GEF, the European Union and the German GTZ have been active in this area but their collective interventions, important though they may be, will not provide an integrated perspective on the combined resources of the Basin (particularly surface and groundwater resources, and their interactions) necessary for effective, future joint basin management efforts.

65. The development and implementation of the Orange River Development Plan (ORDP), undertaken by South Africa and driving many of the current uses of the waters of the system, took place at a time when *public participation and involvement* were not seen as the imperatives that they are today. As supplies in relation to current and projected uses continue to narrow, and as the need to adjust to predictable and non-predictable use questions arise and need to be addressed at all levels, the provision of effective and ongoing public information systems, and comprehensive public involvement vehicles for all affected stakeholders will become management imperatives.

Threats

66. The main threats to the Orange River basin include the following:

- **Over Extraction/Water Scarcity:** Over extraction and water scarcity are threats to the future sustainability of basin resources. In the Lesotho Lowlands for example, it is not possible to provide sufficient water to meet current demand, and the situation is worsening rapidly in many other areas. In South Africa, 14 million people in rural areas had no access to clean water in 1994. Much needs to be done even if DWAF manages to halve this un-served population within the next 7 years. Meeting the needs of the rapidly growing cities and towns is also a challenge for local authorities. In Botswana the situation is difficult along the Molopo River, where access to clean water is not possible due to serious groundwater quantity and quality problems. Desalination plants have been put in place in some areas at high cost. As currently projected supplies will soon be overtaken by projected increased uses, demand side management will likely have to be increasingly considered by countries.
- **Climate Change:** There is some evidence of gradual changes in climate throughout southern Africa¹⁵. Declining aggregate rainfall could have a significant impact on agricultural practices, trade, and, in general, on the quality of life in the Orange River Basin¹⁶. In a basin where water supplies are decreasing and where uses will likely soon outstrip supplies, the effects of global warming could have profound and potentially devastating effects across a range of uses, particularly in the agricultural sector. In summary, observed changes in temperature and precipitation are very likely to change land cover and affect land use patterns in the basin, resulting in shifts in supply and quality of ecosystem services due to altered flow regimes and crop production, biodiversity loss, and increased alien species introductions.

¹⁵ Namibian Ministry of Agriculture, Water and Rural Development.

¹⁶ Recent data shows that the hot season in Namibia has become longer (and the cold season shorter). However, hot months have not necessarily been getting any warmer. If such trends were to continue, risk of frost damage to crops and grass would be diminished and the growing season increased. However, unless rainfall totals increased proportionately, it would mean that increased evapo-transpiration would result in greater stress to plants and increased likelihood of drought. Soil salinization and alkalization could also become an additional challenge. These changes would need to be closely monitored and analyzed.

- **Pollution:** Pollution is a major threat to the overall health of the ecosystem. The waters of the basin are polluted by many activities and uses - human, agricultural, industrial and mining. Water treatment facilities are often limited or non-existent. In Lesotho, the sanitation system in Maseru is completely insufficient, and effluent from mushrooming industrial activities is currently not treated. Agricultural pollution is also a serious threat. For example, returns flows from irrigation, highly developed in the Lower Orange River, may threaten the fragile ecosystems at the river mouth, and quite possibly the receiving waters of the Benguela Current LME. Industrial and mining activities are particularly developed in the Vaal sub-basin, and the water quality of the river has greatly deteriorated in the Vaal tributaries.
- **Land Degradation:** Land degradation poses a threat to many areas within the drainage basin of the Orange River. The problem is manifest in soil erosion and associated landscape degradation, caused by over grazing and poorly suited cultivation practices. Although recent rates of soil erosion are well documented, a longer term study is needed in order to understand whether this is caused by natural climatic change or direct human impacts.

Root Causes

67. The above threats will be evaluated during development of the TDA, when causal chain analyses will be undertaken to better understand root causes. Key determinants of these threats include:

At Regional level:

- The various regional commissions established in the basin have heretofore generally been sufficient to address threats. However, these Commissions lack permanent Secretariats and also lack the consistent availability of personnel and financial resources to function effectively. The capacity to address the conjunction of emerging and accelerating threats is limited. There is little if any regional capacity to undertake anticipatory actions related to the Basin to adapt to environmental variability.
- There has been little attention given to Stakeholder views, knowledge and concerns over the history of Basin management. Without such involvement the kinds of interventions that are likely to become necessary in the future are likely to fail. There has been little attention given to a likely important educational function within the Basin. It is clear that there is within Governments a growing awareness of, and need to act on the serious issues that confront the Basin, but there is little evidence that these pressing issues are well understood by Basin Stakeholders.
- Data and information on water quality/quantity and on transboundary groundwater resources is limited.
- Cooperative endeavors have heretofore focused on the water sector specifically, rather than the production sectors that use water; an integrated cross sectoral focus will be needed to balance water demand and supplies, and address land degradation and other key threats.

At the National level:

- Agencies responsible for water management have many of the legal tools with which to

- address issues confronting the Basin, but lack the human and financial capabilities to do so.
- While each country has legislation that can at least in part address some of the threats to the Basin, improvements and/or modifications in existing legislation, regulations and standards will have to be undertaken and, to the extent necessary, harmonized to enable common approaches to management of the shared Basin.
 - Countries need to improve measurement of uses and thus exert greater control of water abstraction.
 - Cooperation and the sharing of information between and among Ministries are not targeted to the needs of the larger Basin, which cut across Ministerial lines of responsibility.
 - Environmental legislation is often new and difficult to enforce. An example of this is the new Water Act (1998) of the Republic of South Africa, which has just recently defined the importance of the “ecological reserve”. This refers to the water required to protect the aquatic ecosystems of the water resource. However, implementation of the legislation remains problematic. The same holds true for the Environment Act (2001) of Lesotho. Enforcement of Effluent Discharge Licensing, for example, is likely to be difficult to achieve.
 - While some countries have given consideration to revamping water pricing strategies, initiating water trading through use of normal market forces, having users of water bear responsibility for water losses, and water conservation strategies (reducing water demand), there is still much work needing to be done at national levels in these areas.

GEF Alternative

68. The Goal of the Project is to ensure sustainable development of the Basin. The immediate objective of the Project is to identify the principal threats and root causes of the transboundary water resources of the ORB and to develop and implement, through a TDA and SAP process, a programme of policy, legal and institutional reforms and investments to address these threats. The Project will create synergies with and build upon a range of initiatives being undertaken by the countries themselves and those of bi-lateral and multi-lateral donors that have given priority to the Basin. Competing water uses in the context of dwindling and uncertain future supplies is seen as the critical issue in the basin and will be a principal focus of project attention from the very outset of project related activities.

69. One objective of the GEF intervention will be to work with other donors and the countries themselves to build capacity within the planned, permanent secretariat for the ORASECOM. Without such a capacity building program for the Secretariat, work at the regional level will continue to have an *ad-hoc* tendency and progress toward effecting an integrated approach to the management of the basin, and creation of adaptive management capacity will likely not be achieved.

70. There is no TDA for the Basin or a SAP, although a considerable amount of data and information exists and this accumulated data and information will serve as a “springboard” for TDA and SAP development. A TDA will be a principal Output of preparation activities, and preparation and implementation of the SAP a key focus of the GEF Full Project. The Project will also result in a level of public information, involvement and participation that has been largely absent in the past. The ORASECOM and the countries are committed to the initiation of such a

process, and an overall program to realize this objective will be a key component of the GEF funded Preparation and Full Project.

71. The project will be designed in phases. Phase one, the Preparatory Phase, will include development of the TDA. Phase two will be the SAP Development Phase, during which high level multi sectoral stakeholder commitment for SAP implementation will be secured. This phase will include a mix of activities aimed at building foundational capacities to prepare the SAP, develop the SAP, using the accepted GEF SAP process, build public participation mechanisms and capacities, to prepare and provide the foundations for implementing the SAP, and demonstrations, where needed to facilitate early learning and address management gaps already identified in the TDA. Phase 2 has an expected time budget of 4 years; this will be further defined during the course of preparing the TDA. Given the focus on adaptation, and the implied need for tradeoffs between different sectoral uses of water and land resources, an ample time budget will be needed in order to secure the necessary commitments from sector interests, Governments civil society and other actors for SAP implementation. Phase 3 will be the SAP Implementation Phase, and will be largely funded from non-GEF sources. Intervention areas will be defined in the SAP and will include a blend of capacity building support and demonstration activities in the arena of integrated water resource management. Additional interventions may be defined in the areas of biodiversity conservation and sustainable land management, allowing cross focal area benefits to be realized.

Main Project Components:

72. The following provides an overview of likely activities to be pursued in Phase 2: SAP Preparation. Activities for Phase 3, SAP Implementation will be defined in the SAP and are not described here. However, the TDA is expected to give some definition of the scope of SAP implementation.

Outcome/Component 1: Increased institutional capacity for ORASECOM.

Rationale:

73. The countries have chosen to work through the ORASECOM for purposes of project implementation. While the Agreement establishing ORASECOM has legal status, and leaves open an increasing and central role for the ORASECOM in relation to management of basin resources, it does not yet have the operational capacity needed to perform its mandate effectively, particularly beyond the water sector, and also for the complex work of formulating a TDA and SAP. There is a need for the countries to strengthen and give consistency to the communications flow among countries and the various bi-lateral and multi-lateral entities that will be necessary to the task of successful TDA and SAP formulation. This Outcome/Component will establish the expertise necessary to enable ORASECOM to prepare the SAP, as well as provide for project management.

Likely Activities:

- Recruit and hire Project personnel, giving priority to regionally based human resources.
- Create a Project Steering Committee.
- Designate a Lead Agency and in each participating country;
- Define and, as necessary, strengthen the relationship between the ORASECOM and other

- institutions and organizations with responsibility for addressing issues pertinent to the Basin;
- Define additional capacity needed for the effective, long-term functioning of the ORASECOM and other institutions necessary to the success of the overall objective of this project;
 - Provide training for key personnel of the ORASECOM and other key government personnel necessary to prepare the SAP; and
 - Provide support for the establishment and interim operations of a dedicated Project website (this activity likely to have commenced as a result of GTZ assistance).

Outcome/Component 2: Preparation of a Strategic Action Program.

Rationale:

74. Consistent with direction provided under GEF OP#9, the countries will use the results of the TDA, undertaken during preparation, to jointly define and approve (formally endorse) a SAP. This will allow for the development of new, and reform of existing policies and legislation and institutional reform at national and regional levels to effectively address priority transboundary issues identified in the TDA. The Project will employ the process and apply good practices for SAP preparation developed and identified by the UN **TrainSeaCoast Programme**.

Likely Activities:

- Establish and convene work groups to collaboratively develop the SAP;
- Create country level Interministerial Committees;
- Provide international and regional expertise as needed to assist countries in preparation of the SAP;
- Conduct a review and identification of necessary legal and policy reforms consistent with the results of the TDA and for incorporation into the SAP;
- Develop approaches to mobilize resources for the conservation of basin catchments (This activity is already included in an approved Project of the FGEF);
- Based upon a SAP related identification of inconsistencies in, and the development of recommendations for the harmonization of national and related sub-national legislation, standards, and regulations, develop principles for the harmonization of environmentally based water strategies, and update future predictable water demand assumptions at basin scale.

Outcome/Component 3: Successful Undertaking of Pre-SAP Demonstration Projects and Pre-SAP Studies of a Transboundary Nature

Rationale:

75. There is a felt need on the part of the countries to undertake “on the ground actions” of an urgent nature as soon as is possible through early stage implementation of actions to address key agreed transboundary priorities identified in the TDA. These demonstration projects and studies, which advance the management agendas articulated by the countries through ORASECOM, and would build foundational capacity at country and regional levels, would be undertaken in parallel

with SAP development. The indicative array of likely activities below is thus responsive to, and has been suggested by, the participating countries themselves. The suitability of these activities for GEF funding will be evaluated during preparation, together with an assessment of their incremental costs. Of specific importance is the need to create strong working linkages with the GEF supported Namibia Strategic Land Management initiative which seeks to address barriers in implementation, and progressively leverage investment finance from the Government of Namibia, donor community and communities, to take promising management models to scale. At the request of the Government of Namibia, UNDP is taking the lead in managing preparatory activities on behalf of the GEF body corporate. The creation of linkages between this proposed project and the Namibia SLM project is specifically included as an Activity in the Activity list below.

Possible Activities (including co-financed activities):

- The adoption of water conservation and environmental strategies and policies to maximize currently available surface water supplies within the Basin, with particular emphasis on creation of water demand management initiatives, urban sewage treatment re-use strategies, and development of strategies and approaches for the re-use of other “marginal waters.”
- Undertake a gap analysis of existing data to define a basin-wide monitoring network;
- Assist ORASECOM to develop adaptive management strategies for the Basin through, among other things, creation of an interactive and predictive model for the basin incorporating surface and groundwater resources;
- Develop an Orange River basin climate model to detail potential climate change scenarios to assess national and regional vulnerability to, among other things, changes in overall basin water supplies, forced changes in current basin land use patterns, and increased land degradation and consequent pollution from run-off¹⁷; and
- Develop a common, shared Basin observation system housed in ORASECOM.
- Undertake measures to protect the Orange – Senqu River “sponges”, necessary to improve water quality in transboundary areas, an activity to be undertaken in Lesotho, the site of the sponges. (This activity will be receiving early funding by the FGEF);
- Assist in creation of a pollution monitoring system and the development of pollution reduction mechanisms and approaches for pollution from Lesotho lowlands sources;
- Review and update as necessary existing rule curves for the array of control structures throughout the Basin;
- Work with the Namibia Country Partnership on SLM to identify an appropriate land degradation related pilot demonstration activity;
- Improve irrigation scheduling and drainage practices in the Lower Orange River (Another activity that is receiving funding from the FGEF); and
- Support a water quantity and quality study of the return flows from the myriad irrigation projects throughout the system.

Outcome/Component 4: A Basin wide, effective program of Stakeholder Involvement for the full range of Outcomes and Activities envisaged in this Project

¹⁷ This would likely involve PRECIS, Providing Regional Climates for Impact Studies, a regional climate modeling system developed at the University of Cape Town’s Hadley Centre and funded by the UK Department for Environment, Food and Rural Affairs (DFRA), the UK Department for International Development (DFID).

Rationale:

76. Historically, there has been little attention paid to the need to secure stakeholder involvement in, and thus secure broad-based public support for, uses associated with the Orange – Senqu River Basin. There is no question but that some of the measures necessary to effect many of the activities contemplated in this Project Proposal will require cultivation of broad-based public support. And again, with the significant and complex level of adaptation that will be necessary to secure long-term sustainability for the resources of the basin, early and comprehensive public participation is seen as an imperative. This activity will be coordinated with a proposed, EU funded project which seeks to promote the equitable and sustainable management of the Orange/Senqu River basin through the strengthening of community governance structures and institutions in the basin in accordance with the goals of ORASECOM; develop a comprehensive profile of the Orange/Senqu basin; including physical, hydrologic, economic, socio-cultural, climatic and political components, through conducting a series of socio-ecological surveys, involving a range of basin communities with emphasis on promoting the participation of marginalised people; exchange knowledge, ideas, challenges and experiences between communities from various other river basins in southern Africa, including the Okavango, Incomati, Zambezi and the Limpopo; and produce a set of training materials as a “best practise guide” for community participation in the governance of transboundary river-basins.

Likely Activities (including co-financed activities):

- Provide for creation of, among other things, a project web site (modeled on the framework web site established by IW LEARN), creation and distribution of project related newsletters, stakeholder identification activities, assessment of stakeholder needs and inputs, the use of print and other media, public hearings and meetings, and development of NGO forums and small grants facilities, as appropriate.
- Create strong linkages with DLIST Benguela (GEF supported MSP) and with other related DLIST activities in southern Africa with special emphasis on the creation of distance learning/ICT tools to effectively involve local communities and increase communication between and among stakeholder groups.

Outcome/Component 5: Facilitate long-term program and ecosystem monitoring, evaluation and reporting based upon, among other things, initial GEF International Waters indicators.

Rationale:

77. In order to track project success through implementation and beyond, to inform adaptive management, and to determine lessons learned, it will be necessary to institute a rigorous monitoring and evaluation system.

Likely Activities (including co-financed activities):

- Identify, establish and operate an institutional and participatory (inclusive) mechanism responsible for development and implementation of a project Monitoring and Evaluation Plan, including indicators to measure Project progress and overall success. This would result in an ORASECOM adopted suite of International Waters Process, Stress Reduction, and Environmental Status indicators using the improved knowledge base and enhanced regional

institutional arrangements developed over the life of the Project.

Links to BCLME Programme

78. There is increasing evidence that the exchange between the Indian and Atlantic oceans south of Africa is playing and has played a role in present and past global ocean circulation and hence in climate. The Benguela Current LME extends from the Agulhas Current Retroflexion area south of Africa northwards along the coasts of South Africa, Namibia and Angola as far as the Angola/Cabinda Front situated at 5 degrees S. As such it encompasses one of four major coastal upwelling systems globally - one that is bounded both in the north and in the south by warm water systems - and is impacted on by rivers such as the Congo and Orange. The focus of the BCLME program is the integrated management, sustainable development and protection of the ecosystem with emphasis on prioritized transboundary issues, including the effects of natural environmental variability on resources. The geopolitical country boundary between Namibia and South Africa lies close to a major natural boundary within the BCLME - the Luderitz-Orange River Cone area where there the distributions and abundances of a number of key living marine resources change. As meteorological processes in the ORB area are, in part at least, closely associated with ocean-atmosphere interactions in the South Atlantic (of which the Benguela as an important component), and as the Orange River discharge in turn impacts on living and non-living resources over a broad ocean "boundary" zone off the coasts of Namibia and South Africa, there are close ties to the adaptation/vulnerability work planned under the ORB IW project. Simply put, ongoing work in the BCLME programme will benefit the ORB IW project, and in turn will benefit from better understanding of processes in the ORB and improvements in management in the ORB. Given the importance of climate change for the Orange River basin, and that the Orange River delta abuts the Benguela, close synergies will be developed between the GEF LME project and this initiative.

C3. Sustainability

79. The long-term sustainability of the results of this Project rests on the assumption that there is strong and high-level government commitment to the Outputs and Activities that are the subject of this Proposal. Further, sustainability also rests on the parallel commitment on the part of Governments to ensure financial sustainability beyond the life of the Project. The Member States of the ORASECOM have demonstrated their political commitment to the long-term management of the Basin by the establishment of an array of bi-lateral and multi-lateral institutions with direct mandates for addressing the present and future threats to the Basin, including the establishment of a permanent ORASECOM Secretariat to be located in South Africa. The GEF funded Preparation PMU and the PMU for the Full Project will be located in the offices of the permanent ORASECOM Secretariat. Further, the Governments are well aware that in the very near future current and predictable uses of the basin's surface waters will outstrip supplies and that a full-range of measures will have to be jointly identified and undertaken to meet this reality. The joint development of a TDA and SAP are important steps in this overall process.

80. In addition to the country level commitment, there is an already impressive and growing list of bi-lateral and multi-lateral donors who have either already committed resources to the project approach described in this Proposal or are preparing to do so (see Section 14. Financing of the Full Project).

C4. Replicability

81. The overall objectives of this Project have high potential for replicability internationally. A replication Plan will be developed during preparation. Specifically, the project emphasis on climate change modeling, cross-sectoral and regionally driven planning and actions, the incorporation of an IWRM approach to enhance adaptability in a basin where uses are well on the way to outstripping supplies, is likely to be a most instructive experience for many other river basins globally. Further, the strong focus on public involvement in all project activities can also serve as a model exercise for current and planned regionally driven IWRM projects globally.

82. The largest riparian in the Basin, South Africa, has an innovative water policy and accompanying legislation (National Water Policy and National Water Act), which provides amongst other things for the establishment of Catchment Management Agencies at a watershed level. These apply the principle of subsidiarity, devolving responsibilities for integrated water resource management such that water management decisions are taken as close as possible to and with the involvement of the end user. Provision is made for the establishment of water user associations, co-operative associations of water users who wish to collaborate on water management. The project will assist in connecting the CMAs and water user associations with ORASECOM, and thus connect national and transboundary IWRM strategies and programmes. A second point of innovation stemming from the legislation is the requirement to establish downstream ecological reserve requirements for water, as a basis for upstream water allocation within the River basin. The project will contribute to the understanding on ecological reserve parameters for the Orange River. This information, and the approaches employed for information collection and application to management will be useful for other river systems, including, in Southern Africa, the Okavango River Basin. A third innovative aspect concerns the focus on adaptation, in particular the connections to be established with environmental variability assessments and forecasting capacities developed under GEF LME projects in Southern Africa, namely the Benguela Current Large Marine Ecosystem and Agulhas and Somali Current LME programmes. This collaboration will provide a stage for strengthening links between IWRM programmes and LME programmes in the arena of vulnerability assessments for climate change, and adaptation.

83. The political and resource-related circumstances faced in the Orange basin will present the diverse stakeholders in the region with many situations in which "win-win" solutions will not be possible. As such, it will be particularly important to create strong procedural mechanisms for meaningful stakeholder involvement into the project and build the capacity of the relevant institutions to implement and participate in those mechanisms. Doing so will strengthen the democratic character of Orasecom's decision-making processes and help build broad-based consensus by providing a forum for developing solutions that are acceptable across political, cultural and ecological boundaries. The implementation of these participatory practices under such challenging circumstances and over the life of the project will also provide an exceptional opportunity to incorporate adaptive principles into the decision-making approaches that will facilitate the transfer of lessons learned to other basins in the region and across Africa.

84. To enhance public participation and outreach capacity within the Orange River basin, the project will work closely with the GEF IW:LEARN project and its public participation training team, led by the Environmental Law Institute (ELI), in developing and implementing its GEF-mandated stakeholder involvement plans. ELI is undertaking a broader initiative under IW:LEARN's full-sized project to identify and examine the factors that lead to success or failure in participatory water resources management around the world. Of particular importance to Orange

initiative will be the Every River Has It's People project that was implemented in the Okavango River basin, which represents best practice in the SADC region. These lessons will be distilled in the form of a written resource manual that will form the basis of three regional training workshops for GEF international waters projects in Africa, Latin America and Asia. The Orange River basin initiative will thus constitute one of several public participation pilot sites developed, in part, through IW:LEARN's structured learning activities and IW:LEARN-mediated peer-to-peer transfer of best practices between GEF IW projects in Africa and around the world.

C5. Stakeholder involvement/intended beneficiaries

85. All affected stakeholders will be involved in Project activities, both during preparation and Full Project implementation. During Preparation a full stakeholder analysis and involvement plan will be developed. Stakeholders include, among others to be identified during Preparation:

- National government departments (Ministries) responsible for agriculture, mining, environment, finance, foreign affairs, and justice;
- Regional organizations such as ORASECOM, the Lesotho Highlands Development Authority, the Trans Caledon Tunnel Authority between Lesotho and South Africa, the Permanent Water Commission established between Namibia and South Africa, the Joint Irrigation Authority for the Noordoewer and Vioolsdrift irrigation project, and the SADC;
- NGOs at the local, national, regional and international levels;
- Representatives at all levels within the agricultural sector, mining, industry, tourism and recreation, conservation, and others who depend on, or are affected by, the water uses of the resources of the Orange River Basin;
- Donor agencies that are active within the region generally and specifically those involved in activities in the Orange River Basin

An indicative, initial list of Stakeholders appears below.

Stakeholder	Function
Regional	
SADC	Necessary involvement to assure and strengthen a regional approach
Private sector	Necessary to help obtain private sector buy-in for Project activities and subsequent actions that will be part of the SAP
Farmers and landowners	Sustainable farming practices
Local communities	Represented through local government, local civil society structures, traditional leadership; Involved in subsistence farming practices,
Regional NGOs	Assist by contributing community and regionally based input into project activities
Botswana	
National Conservation Strategy Coordinating Agency	Implement NCS; NWSAP implementation
DLUPU	Draft DDP's, assess and direct development initiatives
VDC	Village Development Planning - input to DDPs. Day-to-day representation to local authorities
Land Board	Implement Tribal Land Act Conflict resolution, CHA lease administration
Agricultural Resources Board	Oversee use of plant resources
Range Ecology	Develop and regulate use of grazing resources
DTRP	Ratify regional planning initiatives
Locally based NGOs	Assist by input of community based knowledge
Lesotho	
Ministry of Natural Resources	Responsible for matters pertaining to the water sector

Stakeholder	Function
Department of Rural Water Supply	Responsible for community based water services
Department of Water Affairs	Primarily assumes a regulatory role, issues abstraction licenses, monitors abstractions and pollution
Lesotho Highlands Development Authority (Lesotho representation)	Responsible for Lesotho's input into implementation and operation of LWWP
Lesotho Lowlands Water Supply Scheme	Responsible for increased supplies of water to Lesotho lowlands communities
Water and Sewage Authority	Responsible for water charges (pricing) and urban sewage
Locally based NGOs	Assist by input of community based knowledge
Namibia	
MET	Overall responsibility for environment management, planning, development, maintenance, law enforcement, environmental protection, policies and legislation
MRLGH (and Regional Councils, municipalities, local councils)	Coordination of development at regional level
MAWRD	Overall responsibility for agricultural development and water resource management, coordination of Land Boards at regional level; regulation of animal and plant health through veterinary and phytosanitary control measures; extraction and impoundment of water
MRLGH	Overall responsibility for regional and local governance and the decentralization process, and traditional authorities
MLRR	Overall responsibility for land management, planning, land reform and resettlement
NPC	Overall responsibility for national development planning and coordination
MoF	Overall responsibility for financial and budgetary issues, including MET's budget
NAMPOWER	Responsible for the maintenance of the national electricity supply system, including hydroelectric facilities
NAMWATER	Bulk water supplier for Namibia
Locally based NGOs	Assist by input of community based knowledge
South Africa	
Department of Environmental Affairs and Tourism (DEAT)	Responsible for environmental policy, legislation and developing and implementing the National Environment Management Act (NEMA)
Department of Water Affairs and Forestry (DWAF)	Water Directorate: Water Use and Conservation including identification of catchment management areas for biodiversity conservation (some lie in the grasslands); Working for Water Programme
Department of Agriculture	National Department of Agriculture: National LandCare Programme encouraging a community-based approach to sustainable management and use of agricultural natural resources; involved in rehabilitation of degraded land, removal of alien vegetation, veld and resource management
Department of Land Affairs	Land Reform Programmes including restitution, redistribution and tenure
Provincial government agencies: Eastern Cape, Free State, Gauteng, North West, Mpumalanga, KZN.	Management of provincial protected areas; promotes sustainable utilisation and conservation of biological diversity; includes programmes on protection of indigenous flora and fauna, sustainable utilization of natural resources,
Council for Scientific and Industrial Research (CSIR)	Water, Environment and Forestry Technology: research areas include ecosystem management (alien plant management, fire management, biodiversity management, land use and conservation planning) and catchment management; data on areas suitable for afforestation
Local Government	Integrated Development Planning (IDP) is a strategic plan for municipalities that combines social, economic and ecological factors. Strategic Environmental Assessments (SEA) to ensure incorporation of conservation and sustainable use into development plans Local Economic Development (LED) aims to alleviate poverty
Academic sector (University of Cape Town)	Potential assistance in Regional climate modelling
Locally based NGOs	Assist by input of community based knowledge

D. FINANCING

D1. Financing Plan

86. Phase 1: TDA Preparation and Project Development is costed at US\$ 3.57 million. A PDF-B funding request of US\$ 700,000 is sought from the GEF as cost sharing for this phase. The total cost of Phase 2: SAP Preparation is estimated to be US\$ 39 million: GEF funding will be in the amount of US\$ 6 million¹⁸, while co-finance is expected to be in the range of US\$ 33 million.

D2. Co-financing

87. A summary of GEF and expected co-financing for Phase 2 appears below (US \$):

Components	Total	GEF	Co-financing
Build ORASECOM Capacity	4,500,000	1,000,000	3,500,000
Shared Information System	11,000,000	1,000,000	10,000,000
Specific Demonstration Projects and Studies	16,000,000	2,000,000	14,000,000
Stakeholder Involvement	2,500,000	500,000	2,000,000
Long-term ecosystem monitoring	2,500,000	500,000	2,000,000
Strategic Action Program	2,500,000	1,000,000	1,500,000
Total	39,000,000	6,000,000	33,000,000

E. INSTITUTIONAL COORDINATION AND SUPPORT

E1. Core commitments and Linkages (Linkages to IAs)

88. The project is clearly in line with UNDP's regional priorities in Southern Africa. Specifically, the project's emphasis upon strengthening regionally based institutions, with a view to assuring their long term sustainability links closely with the Second regional cooperation framework for Africa (2002-2006) where under strategic area of support1: Strengthening democratic and participatory governance result (e) specifically mentions "sustainable development frameworks in place in most countries and cross boundary water resources and energy resources managed more effectively". UNDP support to regional inter governmental mechanisms, including SADC and NEPAD will bolster the institutional foundations needed to ensure the adoption and replication of good management practices emerging from this initiative, in other river basins in Africa. In addition the project's emphasis upon the sustainable management of the overall resource associated with the Orange/Senqu River basin and included elements relating to agriculture, energy, land degradation and climate change clearly links into global, regional, and country priorities of the UNDP, particularly as these relate to the UNDP focus on the achievement of Millennium Development Goals 1, eradicating extreme poverty and hunger and 7, ensure environmental sustainability – notably reducing the proportion of people without access to potable water. All of the riparian countries have identified poverty reduction as a priority issue for cooperation with the UNDP. UNDP is working to ensure that all environmental initiatives are fully integrated with existing poverty alleviation programmes, and will play an active role in policy advocacy, to ensure that environment is effectively mainstreamed in poverty alleviation strategies.

¹⁸ It is noted that should there be an enhanced replenishment scenario for GEF a higher GEF co-finance figure will be considered. The TDA will address CC vulnerability and adaptation issues; based on the findings of the TDA, the possibility of including a foundational capacity building component dealing with adaptation issues in Phase 2 will be considered, to be financed with adaptation funds. A close dialogue will be maintained in this respect with the GEF Secretariat Land and water and Climate Change Teams.

89. UNDP interventions in Southern Africa also place a heavy focus on improving governance, particularly with regard to ensuring broad based multi-stakeholder participation in decision making. The strong focus of this project on participatory management is fully aligned with the UNDP strategy. Close links will be maintained with UNDP governance programs to maximize synergies. Further, the countries participating in this Project have all identified food security as an essential issue, an issue that is also a priority for the UNDP. The determination of vulnerability to climate change and adaptation focused interventions planned under this project will contribute to crisis prevention in a drought prone region, and especially in Lesotho, where food security is a key issue. UNDP's Southern African Capacity Initiative (SACI) is geared at assisting countries to improve disaster management capacities, especially for droughts and floods. This work is closely aligned with the vulnerability assessment and adaptation interventions planned under the project.

E2. Consultations, Coordination and Collaboration between and among Implementing Agencies, Executing Agencies, and the GEF Secretariat

90. The proposed project strongly complements a number of GEF supported initiatives within the Orange River Basin, including within the International Waters, Biodiversity Management and Sustainable Land Management Focal Areas. These initiatives are described below, together with a summary of the linkages expected with each project. As is clearly indicated below, establishment of close linkages and coordination with related GEF projects in the region is an imperative, and thus linkages between the proposed project and these other GEF initiatives are described in the "linkages" column. Finally, the project will ensure close linkages with IW:LEARN activities such as IW conferences, and the use of IW:LEARN experience in the creation of designated project website.

Table 1: Current/ Planned GEF Projects within the Orange River Basin

Project Title	Description	Linkages
<i>International Waters: Management of International Seas</i>		
Benguela Current LME (UNDP-GEF) Namibia, South Africa, Angola	The Benguela Current runs parallel to the coastline of South West Africa, from the Cape of Good Hope in the South to Northern Angola, and comprises one of four major coastal upwelling systems globally. GEF is providing funding for the implementation of the LME SAP.	A key focus of the LME project is on understanding the determinants and effects of environmental variability in the LME. As meteorological processes in the ORB are influenced by Oceanographic influences in the Benguela current and cool Southwestern Atlantic airmass there are close ties to the adaptation/ vulnerability work planned under the ORB IW project. The BCLME programme would further benefit from efforts under the ORB IW project to contain upstream releases of POPs. (as part of pollution control activities) A BCLME sponsored workshop on upwelling cells in the Orange River mouth provided input to the design of this concept. GEF is funding the Distance Learning and Information Sharing Tool for the Benguela Coastal Areas (DLIST – Benguela), in support of the Benguela LME programme. DLIST provides a mechanism for knowledge distillation and sharing between coastal communities reliant on the coastal and marine resources of the Benguela System. The project provides for the

Project Title	Description	Linkages
		development of an ICT platform, course development, knowledge management and community outreach. Close links will be established with the Orange River Project, to ensure that best practices for distance learning and ICT are systematically applied.
Groundwater & Drought Management in SADC (WB-GEF) Botswana, Mozambique, South Africa, Zimbabwe	The project is providing support for the development of a groundwater drought management plan for the Limpopo River Basin; and to strengthen technical capacities for regional groundwater drought management support (e.g through establishment of a regional Groundwater Management Institute).	Close links will be maintained with the SADC regional waters programme. [ORASECOM is established under provisions of the SADC Water Protocol.] Site based work in the Limpopo basin may yield lessons for potential application in the ORB, while the enhanced capacity for regional groundwater drought management may be tapped for survey work on aquifers in the ORB. A bi-directional exchange of information will be effected, inter alia to inform development of the ORB-TDA.
IWRM Planning (UNDP-GEF): 2 Projects 1] IWRM component of Namibia Country Partnership on SLM; 2] MSP: IWRM Planning for Southern Africa Botswana, Namibia, Tanzania	These initiatives are supporting the development of national IWRM plans for IWRM plans for water resources management, water sector reforms and investments in Botswana and Namibia. This complements work being undertaken through GWP to strengthen IWRM planning capacities within the SADC region.	The ORB TDA will be linked to national IWRM planning work in the riparian countries. This will allow for the progressive exchange of information and alignment of strategies to balance water demands and supply in respective trans-boundary/ national water management efforts. More immediately, benefits are expected to accrue in the dual arenas of stock taking, and knowledge management.
Protected Areas Projects (WB/ UNDP-GEF) Namibia South Africa	GEF is funding efforts to strengthen management effectiveness in three terrestrial PAs in the ORB, including the Richtersveld PA in SA (WB-GEF), and Ais Ais and Spergebiet PAs in Namibia (UNDP- GEF).	The PA programmes in Richtersveld and Ais Ais PAs will coordinate anti poaching efforts against illegal fishing in the portion of the Orange River within and buffering these sites. The projects will protect storehouses of biodiversity representative of the Succulent Karoo biome: so contributing to larger management goals in the ORB.
Namib Coast Biodiversity Conservation and Management Project (WB-GEF) Namibia	The project is strengthening capacities for Integrated Coastal Zone Management within Namibia. This will include interventions to address direct threats to the Orange River Mouth, including from localised over fishing, unregulated tourism and other pressures.	The ORB IW project will address indirect threats to the Orange River Mouth RAMSAR site, arising from upstream water abstraction and sedimentation. It will also facilitate the adaptation of management processes to address climate-forcing events, impacting the system. Collectively, the two projects will address the direct and indirect pressures affecting the ecosystems of the RAMSAR site, thus preserving globally significant biodiversity in the river mouth.
Namibia Country Partnership on SLM (UNDP-GEF led) Namibia	The CPP aims at building capacity and know how to mainstream Integrated Sustainable Land Management activities in development, in support of Namibia's Vision 2030 and the National Development Plan. Activities are being designed to address barriers to effecting Sustainable Land management and mobilizing investments.	The CPP will install core capacities and know how to address land degradation in Namibia, including within the ORB. The ORB IW project provides an avenue for taking promising approaches to scale, within the Namibia portion of the ORB, but also in neighboring countries. Furthermore, information on land degradation generated under CPP activities will be drawn upon to populate the TDA.
Botswana Sustainable Land Management Project - Land Care Policy (UNDP-GEF)	The objectives of the project are to develop a national land care policy that will inform and guide sustainable land management activities, including a	The project will provide information on land degradation processes for the TDA.

Project Title	Description	Linkages
Botswana	monitoring system to assess policy performance; build capacity for sustainable land management; integration of SLM priorities into national development and environmental frameworks.	
Kalahari-Namib Project: enhancing decision-making through Interactive Environmental Learning and Action in Molopo-Nossob River Basin (UNEP-GEF) Botswana, Namibia and South Africa	The projects aims at containing land degradation and desertification marginal dryland areas in the Molopo – Nossob River Basin. An interactive learning and action process is being piloted, to promote integrated natural resource management.	The ephemeral Nossob/ Molopo rivers, though part of the larger ORB are endoreic downstream of the confluence on the South Africa, Botswana border with no outflow into the Orange River. The SLM project will combat land degradation in this area of the ORB, complementing the limited land restoration activities planned in the headwaters of the Orange River, during the SAP implementation phase.

91. UNDP has consulted with the Task Team Leader for the World Bank responsible for the Bank funded Lesotho Highlands Water Supply Programme. The recommendations/observations provided by the World Bank have been fully accommodated in project design. Likewise, consultations have taken place with the national project proponents of the afore-described GEF projects. These links will be further concretised during preparation of the TDA, allowing for the cross fertilisation of information and good management practices.

E3. Implementation/Execution Arrangements

92. The UNDP will be the Implementing Agency for this Project, and UNOPS will be the Executing Agency. The ORASECOM is expected to play an increasingly important role in Project execution as it moves to create a permanent secretariat function, an action it expects to take in the near term. The Project Management Unit, during preparation and Full Project implementation, will be co-located with the ORASECOM Secretariat, which is being initially funded by the GTZ and the member countries. The ORASECOM Secretariat and the project will be located in South Africa.

PART II – PROJECT DEVELOPMENT FACILITY

A. DESCRIPTION OF PROPOSED PDF B ACTIVITIES

93. A PDF B is being requested for the further development of the project. The PDF B will be implemented over an 18-month period, starting in mid-2005. It is anticipated that the Full Project Brief will be submitted to GEF Council for review in late 2006. One of the main Outputs of the PDF B will be a Transboundary Diagnostic Analysis. The TDA will begin with the identification of country priority issues for the Basin, and from those country exercises, the countries will jointly, through the ORASECOM, determine and prioritize issues of a transboundary nature. It is expected that these country level efforts will be inter-ministerial in nature, consistent with individual country approaches. The TDA will constitute an updated and comprehensive background scientific document to be used as a basis for planning, priority setting, and decision-making, and will be instrumental in establishing linkages with other donors and related projects in the Basin.

94. The SAP will be developed during full Project implementation under the auspices of the

ORASECOM, and the ORASECOM, through its members, will be responsible for achieving country buy-in for the SAP at the necessary inter-ministerial level. The TDA and SAP will utilize the TDA/SAP methodology and curriculum developed over the last two years under the UNDP-GEF Train-Sea-Coast programme. The need for, and provision of assistance to secure broad stakeholder involvement will begin in the Preparatory Phase, and one Output of Preparation will be development of a comprehensive Stakeholder Involvement Plan to be executed during Full Project implementation.

95. The PDF-B will also generate the detailed information needed to prepare a fully-costed GEF Executive Summary and UNDP-GEF Project Document. Preparation activity by component and a sequence of detailed activities with associated costs appears below:

Component 1. (GEF PDF-B: US\$ 250,000; Countries and ORASECOM US\$ 200,000)

96. Consolidated Mechanisms for consultation and co-ordination among the participating countries through creation of a Project Management Unit (PMU), a Project Steering Committee (PSC) and Country Inter-ministerial Committees (IMCs).

Activities/Outputs:

- Establishment of the PMU co-located in the offices of the ORASECOM;
- Establishment of the PSC and the IMCs; and
- Establishment of a Project Web Site.

Component 2. (GEF PDF B: US\$ 250,000; Country and ORASECOM Co-finance: US\$ 250,000)

97. A Transboundary Diagnostic Analysis containing sufficient details to form the basis for the completion of a Strategic Action Program which would start implementation during Full Project Phase, and retention of the necessary regional and international expertise for completion of the TDA. The processes established by the TrainSeaCoast Programme for TDA preparation, will be applied. In light of the fact that climate change is identified as a significant threat to the environmental integrity of the Basin, the TDA will include an analysis of vulnerability and adaptation related issues.

Activities/Outputs:

- A TDA for the basin; and
- Separate reports of activities undertaken during the TDA process and consultations held.

Component 3. (GEF PDF B: US\$ 100,000; EU Co-finance¹⁹: US\$ 1,200,000; Country and ORASECOM Co-finance: US\$ 175,000)

98. Initial Stakeholder Consultations and a detailed Stakeholder Involvement Plan to be

¹⁹ Indicative co-finance based on a project proposal to the EU Water Facility, and while this proposed project may extend into project implementation phase, its indicative value has been incorporated into Preparation..

implemented during Full Project Phase²⁰.

Activities/Outputs:

- Undertake a full range of stakeholder consultations;
- Develop a Stakeholder Analysis; and
- Prepare a Stakeholder Involvement Plan to be undertaken during Full Project implementation.

Component 4. (GEF PDF B: US\$ US\$ 100,000; Country and ORASECOM Co-finance US\$ 50,000)

99. A fully-costed GEF Executive Summary and UNDP Project Document and donor consultations.

Activities/Outputs:

- A fully integrated Project Brief with a logical framework, detailed workplan, schedule, ToR for all consulting work, costings, logistical requirements and targets;
- A report describing project based donor consultations; and
- Letters endorsing the co-financing commitments.

B. PDF BLOCK B OUTPUTS

100. The principal outputs of the PDF-B will be the TDA, the Stakeholder Participation Plan to be undertaken during Full Project implementation, and a fully-costed Executive Summary and UNDP Project Document. Other outputs will be reports on donor consultations and the mechanisms through which key Project institutions such as the PSC, the PMU and the IMCs will be continued under Full Project implementation.

C. JUSTIFICATION

101. The Orange River Basin is an internationally important waterbody seriously threatened at many levels, many of them at a transboundary level, and cannot be effectively addressed at the single country level. The catchment area is important in terms of industrial production, agriculture, and pastoral activity, contains significant and globally important biodiversity, and is in need of an assessment (TDA), and development of a regionally based SAP to effectively address serious environmental issues. The catchment area is huge, approximately 3% of the African land-mass, and its high value across a range of uses and values makes it a crucially important resource to the participating countries. Governments in the region are committed to improved cooperation as evidenced by the creation of the several international entities previously described in this proposal. However, existing mechanisms to operationalise this commitment are still in the formative stages, and the provision of GEF support, in cooperation with the FGEF, which has already approved a US\$ 1.9M. Project for the Orange River Basin, the GTZ, which has supported initial discussions to strengthen the capacity of the ORASECOM, the EU, UNESCO, the countries themselves, and other donors that will be recruited as part of the GEF project can close the gap between the stated

²⁰ Per recent deliberations among the GEF IW Task Force (including GEF Secretariat and UNDP-GEF representatives), 1% of the PDF B budget (to be charged against this component) will be made available for Orange River participation in IW:LEARN activities, such as the public participation enhancement initiative for the TDA.

objectives of the countries, as articulated in the Agreement creating the ORASECOM.

D. TIMETABLE

102. The PDF B activities will have a duration of 18 months. The matrix below presents the workplan:

EXPECTED OUTPUTS	Key Activities	TIMEFRAME						RESPONSIBLE PARTNER
		Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	
Coordination Mechanisms	Establishment of PMU	x	x	x	x	x	x	Participating Countries; ORASECOM
	Establishment of PSC	x	x	x	x	x	x	
	Establishment of IMCs	x	x	x	x	x	x	
Development of TDA (Including Demonstration Activity Preparation)	TDA Preparation		x	x	x	x		Participating Countries; ORASECOM
	Documentation of Activities leading to TDA Demonstration Activity Preparation				x	x	x	
Public Participation	Stakeholder Activities During Preparation		x	x	x	x	x	Participating Countries; ORASECOM
	Stakeholder Participation Plan for Full Project				x	x	x	
Fully-costed Project Brief and Document	Final draft PB and Document				x	x	x	Participating Countries; ORASECOM
	Donor Consultations/Final Report	x	x	x	x	x	x	

E. BUDGET

103. The total value of the PDF B is US\$ 3,575,000, of which US\$ 700,000 is requested from GEF and US\$ 2,875,000 represents co-financing from the EU, Participating Countries and ORASECOM.

	Outputs	GEF (US\$)	Countries	ORASECOM	FGEF/GTZ/EU	Total/activity (US\$)
1	Coordination	250,000	150,000	50,000	300,000	700,000
2	TDA Preparation	325,000	150,000	50,000	900,000	1,350,000
3	Stakeholder Involvement	75,000	150,000	75,000	1,300,000	1,600,000
4	Executive Summary/Project Document Preparation/Donor Consultations	50,000	25,000	25,000	0	150,000

ANNEX 1 - MAP OF THE ORANGE SENQUI RIVER BASIN



ANNEX 2 - MATRIX OF THREATS, ROOT CAUSES AND SOLUTIONS

Environmental Impact	Root Causes	Management Issues/ Key Barriers	Solutions: Interventions from project Barrier Removal Activities
Global Climate Change	Growing evidence of anthropogenic induced changes in temperature regimes and rainfall conditions have been noted; as a very high percentage of the Basin is arid, or semi-arid, and land degradation is already a major concern, the region is likely to be severely impacted by climate induced change.	Creates uncertainty for long-term forecasting and creates a need for adaptive management approaches to better prepare for uncertainty. Barriers include lack of capacity to predict (model) likely effects and thus develop contingencies to mitigate such effects. The information needs include those related to food security, needs of the energy sector, and basic human sanitation needs.	Make provision for increasing the region's climate change modeling capabilities; create within the ORASECOM and other regional organizations and within the countries themselves the capability for adaptive management approaches to basin problems, in the context of IWRM. Create synergies with the GEF Benguela Current LME project which will explore the relation of Benguela circulation patterns and the role of these patterns in climate change.
Threat:			
Over-extraction/water scarcity	Limited surface water supplies within all of the participating countries except Lesotho. Water supplies in some downstream areas suffer from pollution. Heavy pressure on some groundwater aquifers, others are salinated. Lack of regional approaches to mitigate issue of water scarcity	Regional organizations exist on paper, but no formal Secretariats yet established. Regionally-based groundwater mapping exercises to effectively map international groundwater resources not planned. Water demand schemes need to be emphasized to greater degree than currently the case. An approach that takes into account ecosystem services needs to be taken. Trade-offs regarding current and planned water resources need to be assessed at various government levels, with public participation being a salient feature of such exercises.	Develop an improved, comprehensive hydraulic model for the Vaal and orange Rivers; protect Orange-Senqu "sponges." Groundwater review of the Molopo basin; support a feasibility study for the Molop-Nossob watercourse in Botswana; undertake an EIA to assess effects of development in the Lower Orange River; undertake a review of the environmental benefits and needs at the mouth of the Orange River to determine effects of future upstream development activities; review and update as necessary existing dam rule curves; improve irrigation scheduling and drainage practices in the Lower Orange River; undertake a water quality and quantity study of return flows from the various irrigation areas in the basin; develop adaptive management strategies; review the quality of existing national databases for eventual use in a regional database under the auspices of the ORASECOM; undertake a gap analysis of the current extent and effectiveness of a basin-wide monitoring network.; assess the current and predictable future uses of transboundary groundwater aquifers in the Basin, including the relationship between groundwater and surface water supplies; establish key basin indicators to verify compliance with current and future water management plans..
Threat:			
Pollution	Pollution in the basin comes from	There is insufficient information on exact levels of pollution and the	Solutions as envisaged by the project would include; undertaking a review of efforts to harmonize guidelines and standards for water

Environmental Impact	Root Causes	Management Issues/ Key Barriers	Solutions: Interventions from project Barrier Removal Activities
	<p>pesticide run-off from the many irrigation schemes in the middle reaches of the river basin, from mining activities, and from conventional pollutants.</p>	<p>consequences of pollution loads on an array of downstream users and on ecological function and biodiversity. There is little or no information on the potential effects of river pollution on the receiving waters of the rich Benguela Current. As pollution is often a consequence of upstream riparian countries discharging pollution that has an effect on riparians and natural systems in a downstream nation, international organizations must play a vital role in the identification of sources and effects, but at present existing regional organizations do not have the resources to assume that role.</p>	<p>quality monitoring and progressive development of an integrated river basin water quality monitoring system, under the direction of ORASECOM; assist in the creation of a pollution monitoring system and the development of treatment mechanisms for pollution from Lesotho lowlands sources; undertake a water quality study of the return flows from the many irrigation schemes in the basin; provide support for the development of an urban sewage treatment water re-use strategy; and assure strong public participation in all activities relating to pollution issues in the basin.</p>
Threat:			
<p>Land Degradation</p>	<p>The desert or near desert characteristics of most of the basin makes it susceptible to land degradation. Overgrazing, harmful agricultural practices, and the unjust distribution of land in the former homelands of South Africa are major contributors to land degradation. The present and future predictable add-on effects of climate change are likely to increase dangers posed by land degradation in the basin. The Molopo region in Botswana, part of the larger Orange River Basin, and the basin areas within Namibia are both areas that are highly vulnerable. In South Africa more than 90% of the country is characterized as arid, semi-arid, or sub-humid, and approximately 25% of the magisterial districts are severely degraded. Land degradation is also a major cause of migration to the cities.</p>	<p>Issues related to overgrazing and agricultural practices are essential rooted at national and community levels, while issues related to climate change are a regional and international issue. At national and local levels strong public participation and education programs will need to be implemented to effectively address issues related to land degradation, while management measures to address climate change effects have been previously described.</p>	<p>The far reaching and intensive public participation program envisioned in the project, together with initiatives aimed at creating a better understanding of the effects climate change will have on the basin's resources are the key elements of removing the barriers to improved practices which would stem land degradation. Too often scientific assessments exclude the people most closely connected to assessed ecosystems and services, and comprise their credibility and effect. The project is committed to valuing the stakeholder knowledge and perceptions by incorporating these into the assessment process of not only issues related to land degradation, but all other issues related to the project.</p>

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