AFRICAN RIVERS INITIATIVE:

CONCEPT PAPER

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Summary

The provision of adequate quantity and quality of freshwater of freshwater to people and nature in Africa is one of the continent's greatest challenges. Almost half the African population suffers from one of six major water related diseases. In 2025, 50% of Africa's people are predicted to face water stress and scarcity. Freshwater fish provide 21% of protein intake in Africa. Only through integrated river basin management can governments and local people work together to provide the water needed to sustain both people and the environment.

This proposal, part of the WWF Living Waters Programme, is for large-scale, sustainable Integrated River Basin Management (IRBM [1]) – focusing on the conservation, wise use and restoration of freshwater resources and ecological processes in Africa. We propose investment to coordinate and build on existing government and non-government programmes to sustainably manage six major trans-national river basins and the four mountain regions that are the source of key rivers.

This initiative is specifically is designed to contribute to the challenging programme of activities being developed in response to NEPAD, the New Partnership for Africa's Development. Sustainably managed river basins will alleviate poverty by providing clean water, food, improved health, and sustainable livelihoods. Over 70 million people rely on the rivers included in this initiative.

Additional funding of USD14 million is required each year for five years. WWF seeks a major donor to join us in implementing this strategic initiative.

[1] For the purposes of this proposal, IRBM is considered as encompassing closely allied approaches such as Integrated Water Resources Management and Integrated Catchment Management.

Africa's Arteries of Life: Rivers for People and Nature

The Earth's systems and biological systems provide humans with essential goods and services. Physical, chemical and biological processes link global environmental problems so that changes in one have repercussions for others. Actions taken to meet human needs have local, regional and global consequences. The same driving forces – population size, consumption levels and choice of technologies – underlie all global environmental problems. All people affect the environment and vice versa but the rich have a disproportionately higher impact and the poor tend to be the most vulnerable to the effects of environmental degradation. [2]

The Millennium Declaration by the United Nations in September 2000 considered "*respect for nature one of the fundamental values essential to international relations in the 21st century*". It built on the International Development Targets (Box 1) by resolving to halve the proportion of people who are unable to reach or afford safe drinking water and reverse the loss of environmental resources by 2015.

More strongly, the Declaration urges that no effort must be spared to free all of humanity and above all our children and grandchildren from the threat of living on a planet irredeemably spoilt by human activities and whose resources would no longer be sufficient for their needs. Pivotal in achieving this is the necessity to stop the unsustainable exploitation of water resources by developing water management strategies at the regional, national and local levels that promote both equitable access and adequate supplies.[3]

Box 1: International Development Targets

Economic well being
To reduce the proportion of people living in extreme poverty by half between1990 and 2015;

Social and human development
To enrol all children of school age in primary schools by 2015;
To make progress towards gender equality and empowering women by eliminating gender disparities in the enrolment in primary and secondary education by 2005;
To reduce infant and child mortality ratios by two-thirds between 1990 and 2015;
To reduce maternal mortality ratios by three-quarters between 1990 and 2015;
To provide access for all who need reproductive health services by 2015;

Environmental sustainability and regeneration
To implement national strategies for sustainable development by 2005, so as to reverse the loss of environmental resources by 2015.

Water and Development in Africa

In October 2001 emerging from the union of two African initiatives, the Omega Plan and the Millennium Partnership for Africa's Recovery (MAPS), a bold and encompassing vision for the socio-economic development of Africa was announced by the then Organisation of African Unity (OAU now the African Union, AU) as the New Partnership for Africa's Development (NEPAD)[4]. The vision is a plan conceived and developed by African leaders that presents an holistic, comprehensive and integrated strategic framework stating the problems facing the continent and proposing a programme to achieve the long term objective "*to eradicate poverty in Africa and to place African countries, both individually and collectively, on a path of sustainable growth and development and thus halt the marginalisation of Africa in the globalisation process*".

[2] Protecting our planet, securing our future, UNEP, US NASA, World Bank, November 1998
[3] www.un.org/millenium/declaration/ares552e.htm
[4] New Partnership for Africa's Development (NEPAD), October 2001

The partnership seeks to achieve this objective by sustained growth of gross domestic product and by achieving the agreed International Development Targets.

Within the NEPAD strategy recognition of the key need to ensure sustainable access to safe and adequate **water supply and sanitation** is identified as a sectoral priority that will be achieved by:

- Planning and managing water resources to become a basis for national and regional coo-operation and development;
- Systematically addressing and sustaining ecosystems, biodiversity and wildlife;
- Co-operating on shared rivers among member states.

NEPAD's **Energy** objective, *to exploit and develop the hydropower potential of river basins of Africa* reinforces the need for an integrated approach to shared water systems.

Additionally under the consideration of its **environmental initiative** NEPAD recognises the contribution of a healthy environmental base to the reduction of poverty proposing initiatives including wetland conservation, coastal management, cross- border conservation areas and environmental governance.

Water and the World Summit on Sustainable Development

The Ministerial Declaration of the Second World Water Forum in The Hague, Netherlands, (March 2000) set water security as a principal concern for sustainable development in the twenty first century. The global statistics speak for themselves.

- Approximately one in three people live in regions of moderate to high water stress and it is estimated that two thirds of people will live in water stressed conditions by 2025 (WBGU 1999, UNEP 1999).
- Human demand and the misuse of water resources continue to grow. Intensive irrigation is placing steadily increasing pressure on aquifers and their ability to recharge, and reported incidences of groundwater and surface water contamination continues to rise.
- In large cities, total municipal and industrial uses of water have grown by 24 times in the last century and urban populations are expected to grow to 5 billion people by 2025.
- Some large-scale water infrastructure projects and an intensification and greater frequency of natural threats, such as flooding and droughts, are having a devastating impact on people's livelihood and access to water.

All of these pressures are also placing freshwater ecosystems and their associated species under enormous strain. The critical issues for water security, in terms of the causes and the resultant impacts, are particular to each locality and region of the world.

Bonn Conference on Freshwater

In December 2001 the International Conference on Freshwater held in Bonn focused on water as a key to sustainable development, and recommended priority actions as follows [5]:

- Governance
- Mobilising financial resources
- Capacity building and sharing knowledge

Within these recommendations the need is identified to improve the participation of people, particularly the poor, who are often excluded from decision making. Basic principles were adopted, including that water resources policies and management should be linked with other international agreements and processes including those concerned with wetlands, dams, biodiversity, forests, the marine environment, and climate change. Water should be equitably and sustainably allocated, firstly to basic human needs and then to the functioning of ecosystems and different economic uses including food security. Further, allocation mechanisms should balance competing demands and take into account the social, economic and environmental values of water. They should also reflect the links

[5] International Conference on Freshwater, Bonn, December 2001

between surface and groundwater and those between inland and coastal water, growing urbanisation, land management, the need to maintain ecosystem integrity and the threats of desertification and environmental degradation. The Conference concluded that:

- Integrated water resources management should be sustainable and optimise water security and human benefit per unit of water while protecting the integrity of ecosystems. Water should be treated as a valuable and finite resource. Water demand should be more actively managed, and water use efficiency increased in all uses.
- Irrigated agriculture is the world's largest user of water, and therefore offers the largest potential in terms of water savings, the benefits of which can be shared with other sectors. Countries should set appropriate national targets to improve the equity and efficiency with which water resources are used.
- The value of ecosystems should be recognised in water allocation and river basin management. Allocations should at a minimum ensure flows through ecosystems at levels that maintain their integrity.

EU communication on water management in developing countries

Building on the recommendations of the Bonn Conference the EU, in March 2002, has communicated its desire to promote the development of an EU Water Initiative as a key contribution for the World Summit on Sustainable Development [6]. This initiative highlights the imperative to build strategies on the overarching principles of Integrated Water Resource Management, focusing on water supply and sanitation, transboundary water management and cross sectoral co-ordination and integration. It recognises that economic, social and environmental sustainability require implementation of a management by demand that involves valuing of water for all its uses. Management at river basin level, participation by all stakeholders (and especially women) at every step of the decision making process, knowledge and information exchange will promote institutional sustainability and conflict prevention.

Over the last ten years rural sanitation provision in Africa has decreased by 2%, and the low levels of urban water supply and sanitation have hardly improved. Arid and semi-arid areas, especially in West Asia and North Africa, are likely to be most impacted by increased water stress. Underlying many of these problems is the fact that water is a fixed resource, faced with increasing demand and pressure from competing water uses.

The Water Crisis in Africa

Africa would appear to be blessed with abundant water resources in large rivers and lakes such as the Congo, Nile, Zambezi and Niger and in Lakes Victoria the second largest lake in the world. The disparities of water availability across the continent are however the basis of the overall problem that is exacerbated in many regions by locally inadequate management of existing supplies. A typical example of the disparity in water availability lies within the Congo basin where 30% of the continents water drains land inhabited by only 10 % of Africa's population. These disparities lead to some of the prevailing issues facing the region, summarised in the striking statistics below:

Poverty and water scarcity:

- 14 countries are already experiencing water stress, another 11 countries are expected to join them by 2025 at which time nearly 50% of Africa's predicted population of 1.45 billion people will face water stress or scarcity.
- Nearly 51% (300 million) of people in sub-Saharan countries lack access to safe supply and 41% lack adequate sanitation.

Health:

- Almost half of the African population (778 million in 1997) suffers from one of the six major water related diseases.

[6] COM (2002) 132 Final, Brussels, 12.03.2002

Environmental security:

- Lack of ground water protection from *agricultural uses,* which makes up 88% of total water use.
- Lack of *risk preparedness and mitigation*: flooding, droughts, storms, displacing human settlements and has chronic health effects e.g. in Mozambique over 1 million people were displaced by the floods (in 1999/2000) and an unknown number killed.

In addition, freshwater systems in Africa play a major role in livelihoods and food security*:*

- Fish constitutes 21% of animal protein intake in Africa, a figure second only to the Far East. In 1994, the total freshwater catch in sub-saharan Africa was 1.6 million tonnes - 40% of the total fisheries for the region.
- In 1998, the SADC countries inland fishery totalled 619,000 tonnes, and represented 7.7 % of the world total. At 420,000 tonnes in 1998, the freshwater catch in ECOWAS countries (West Africa) was 5.2 % of the world total.

Water and the environment in Africa

Whilst all the current proposals for the development of water management recognise the environmental needs for water to be considered in integrated river basin management processes few, if any, place the river basin environment and ecosystem health as the primary and fundamental basis of optimal water provision.

This proposal bases itself on the recognition of international opinion of the development needs for integrated river basin management but builds itself particularly on the investment in river basin management for people and nature. The capacity of any river basin to provide water for people's development and livelihood needs will be maximised by allowing an adequate environmental flow to be maintained in the river. River fisheries are one example of a natural resource essential for peoples' livelihoods that require environmental flows.

There are about 80 international river and lake basins in Africa, and many downstream countries derive most of their water from outside national boundaries. However, despite the potential for tension over shared watercourses, in general, the institutional framework for managing shared resources is weak. A notable exception is the SADC Protocol on Shared Watercourse Systems that takes into environmental needs into account as a basis for sustainable development.

WWF's Approach

The vision of the Living Waters Programme *is to have healthy freshwater ecosystems around the world enhance the quality of life on Earth, and people value nature as the source of water by*:

- protecting and sustainably managing high priority freshwater ecosystems;
- maintaining or restoring ecological processes of rivers and lakes; and
- promoting sustainable water use by agriculture and industry.

To support this vision, since 1999 WWF has been developing a coherent methodology for freshwater ecoregion conservation reflecting best practice in IRBM. This methodology, which emphasises strategic biodiversity conservation focused on the world's most biodiverse rivers identified through the *Global 200* assessment, is being put to practice in pilot programmes, including the Everglades and the South East Rivers of the United States, the Rio Bravo/Grande of the United States and Mexico, Pantanal in Brazil and the Yangtze in China

The WWF basin programme has been devised by the Living Waters Programme, as a response to the pressing need for moving from the theory of Integrated River Basin Management to its effective

implementation on the ground. WWF is convinced that IRBM is the key to sustainable management and use of the world's freshwater resources to benefit people and nature. WWF also believes that in spite of the hydrological, ecological and socio-economic variations among river basins in different regions of the world, there are common hurdles that must be overcome. It is therefore the identification, implementation and dissemination of effective approaches and solutions to shared problems that form the core of this proposal.

The WWF basin approach is built around four principal interventions:

- **Building capacity for effective and sustainable IRBM**, with a focus on environmental matters. This component of the WWF basin programme will be developed in cooperation with IHE/UNESCO World Water Institute and the WWF College.

- **Promoting effective IRBM dialogues**, concentrating on linking existing efforts and on improving or establishing river basin organisations. Special attention will be given to facilitation of networking and synergy among existing initiatives.

- **Encouraging the development and implementation of IRBM-Plans**. While seeking to stimulate all relevant actors to participate in the management planning process, WWF will focus on solid incorporation of environmental aspects into the IRBM plans.

- **Application and promotion of IRBM-based approaches and solutions** for the conservation and sustainable use of freshwater resources. This will involve the establishment of field projects and the capturing and dissemination of lessons learned.

Proposed Interventions

WWF is proposing a series of interventions throughout Africa that will demonstrate good practice in integrated river basin management. The intervention areas have been selected for their:

1. Potential demonstration value of the benefits for people and conservation of river basin management in a range of challenging policy contexts and environments, and

2. Contribution to the conservation of areas that are defined for their globally outstanding biodiversity values - collectively these areas are known as the *Global 200* or *G200*[7]. WWF has selected a number of focal ecoregions in Africa, and interventions are designed to enhance and complement the existing ecoregion conservation initiative.

Track I. Investing in rivers for people and nature

Traditional aid for water resource management has focused on infrastructure development projects of dams and water management infrastructure. In many cases this has brought considerable benefits to certain sectors of society and communities through provision of water, food and electricity. However, this development strategy is no longer appropriate as:

- The World Commission on Dams report published in 2001[8] suggests that in most instances dam development has not fulfilled predicted economic, power, water or social benefits, and that future developments should be subject to *needs and options assessments*;

[7] The *Global 200* is a science based ranking of the Earth's most biologically outstanding terrestrial, freshwater and marine habitats. *The Global 200: A Users Guide*. WWF US Conservation Science Department, 2000
[8] *Dams and Development: A New Framework for Decision Making.* Earthscan, November 2000 / www.dams.org

- Large scale water infrastructure developments invariably have not been designed in any integrated manner whereby the cost benefit analysis is applied to all stakeholders – nature and the river basin included.
- Increasingly limited and polluted water supplies require a switch to better management of existing water supplies, that is, more efficient use of water and using nature to provide and clean water supplies;
- The importance of sustaining protein for local communities from river and lake fisheries, and detrimental impact of water infrastructure developments on these fisheries is now recognised;
- Limited water supplies in trans-boundary river systems, which are exacerbated by water infrastructure developments, are becoming a source of conflict;
- The South African 'Working for Water Programme' has demonstrated that investment in nature can enhance water supplies and sustain livelihoods and nature conservation.

This programme will apply these lessons by demonstrating that agreements to share resources and invest in nature to sustain water supplies in the selected river basins will improve water quality and quantity, food security, sustain livelihoods and enhance nature conservation.

We propose that in six large African river and lake basins, summarised below, WWF will lead with interventions that will:

1. Bring together existing water and river basin conservation initiatives to better target existing aid and local resources;
2. Broker agreements between relevant national and provincial governments to share and manage trans-boundary rivers;
3. Engage key community stakeholders in river basin management;
4. Establish (or enhance) river basin management authorities with capacity to implement these agreements with local communities;
5. Demonstrate water and river basin conservation techniques that improve and sustain livelihoods, water supplies and food security in one or more sub-catchment projects in each basin, particularly mountain catchments.

River Niger

Figures	Catchment area- 2,261,763 km² (7.5 % of the continents area) Length - 4,100 km
Major Tributary	Benue (Nigeria /Cameroon)
Countries	Algeria, Benin, Burkina Faso, Cameroon, Chad, Guinea, Côte d'Ivoire, Mali, Mauritania, Niger, Nigeria.
WWF G200 status	#155 Niger River Delta #97 Sudd-Sahelian Flooded Grasslands & Savannas #3 Cameroon Highland Forests

The Niger is the third largest river in Africa, and can be regarded as the lifeline or backbone of the West African sub-region. The headwaters of the Niger are in Guinea (Fouta Djalon and Mount Nimba mountain range) and the River Benue in Nigeria and Cameroon (The Cameroon Highlands). Two major areas of high biodiversity value are the inland delta in Mali, and the Niger Delta in Nigeria, the second largest delta in the world. This major river basin provides a full range of goods and services; physical, biological and economical, for the countries through which it runs, as well as, indirectly, for many more countries in the region. The region has been seriously impacted by drought since the 1970s. Major dams constructed on

both the Niger and Benue have had major effects on the river and future proposals for further dams and their potential impact must be considered carefully

The Niger contains 243 fish species in 36 families, of which 20 species are endemic. Vast floodplains along the river and the river itself are home to threatened species such as the West African manatee, hippopotamus, crocodile and black-crowned crane.

WWF Project: Niger Basin Initiative

Lake Chad

Size	2,426,370 km²
Countries	Central Africa Republic (CAR),Chad, Cameroon (especially Logone sub-basin)
Subbasins	Rivers Chari and Logone (590,000 km²)
WWF G200 status	# 97 - Sudd-Sahelian Flooded Savannas # 89 - Sudanian Savannas

The Chari, with its tributary, the Logone, provides 95% of the water flow into Lake Chad, the "shrinking lake" of Africa that has seen a massive reduction in area in the past decades. Poor land use in the catchment, and deforestation are threatening to reduce this critical flow, in a region already impacted by three decades of drought. The River Chari and its floodplains support a rich terrestrial and avifauna typical of the Sudano-Sahelian region. Over 100 species of fish have been recorded from the upper the Upper Chari system. Studies currently underway for a scheme to transfer water from the Oubangui river system in to the Chari to boost flows to Lake Chad: this could have a serious impact on the river flora and fauna that includes endemic species not found in the Oubangui system.

Some 20 million people depend on the lake and its associated resources: by 2020 this figure is expected to rise to 35 million. The economy in the upper catchment is based on fishing, agriculture and pastoralism. Exploitation of wildlife, particularly by poachers, is widespread in the Chad-CAR border regions.

Great Ruaha

Size	± 40,000 km^2, the Ruaha is itself a sub-basin of the Rufiji catchment
Countries	Tanzania
WWF G200 status	# 9 - Eastern Arc Montane Forests (Udzungwa Mountain catchment) # 88 - Central and Eastern Miombo Woodlands # 103 - Southern Rift Montane woodlands (Kipengere catchment)

The Great Ruaha River is one of Tanzania's largest rivers and the Ruaha National Park through which it flows one of Africa's finest examples of unspoilt "wilderness". The Great Ruaha River starts in the highlands of the Usangu catchment. From here it flows through the Usangu wetland — home to 350 species of birds and a potential Ramsar site — and onwards to the Ruaha National Park and Mtera Reservoir.

In the Ruaha National Park, the river has dried up every dry season since 1993, with the dry period tending to start earlier and last longer. This has had severe impacts on the wildlife, including the aquatic fauna, and may threaten the tourist potential of the parks, as well as the livelihoods of agriculturalists and pastoralists

and the generation of hydro-power. Over-extraction of water for irrigation in the dry season is compounded by deforestation in the upper catchment.

The largely agro-based economy includes upland farmers, lowland small scale rice farmers and large scale irrigated government rice farms, and pastoralists. There are some conflicts between agriculturalists and pastoralists who blame each other for the decline in water availability. The population has increased dramatically, largely as a result of influxes of people in the 70s and 80s, precipitated by the promotion of agriculture in the area by the government. Power generation from the Mtera regulating reservoir and the downstream Kidatu Dam both on the Great Ruaha River currently supplies nearly 50% of Tanzania's electricity.

The river links two focal ecoregions - Miombo and Eastern African Marine, and there are several existing and planned WWF projects in the catchment.

Kafue/Lower Zambezi

Size	1,332,574 km² (Zambezi)
Countries	Angola, Malawi, Mozambique, Zambia, Zimbabwe
Subbasins	Many, including Kafue & Shire
WWF G200 status	# 98 Zambezian Flooded Savannas # 88 - Central and Eastern Miombo Woodlands # 136 - East Africa Mangroves

The Zambezi River, its tributaries and associated wetlands support some of the largest intact blocks of wildlife habitat in Africa. Major floodplain areas such as the Okavango, Kafue flats, and Zambezi delta are wetlands of international importance supporting major bird faunas including the wattled crane, rare and threatened species such as the Kafue lechwe and sitatunga, as well as kudu, duiker, oribi and warthog, and vast numbers of hippos and crocodiles.

Home to over 38 million people, the Zambezi and its basin are subject to a wide range of uses from agriculture and livestock grazing, to provision of freshwater and fish - the river supports millions of livelihoods directly and indirectly across Southern Africa. The wildlife habitats and the river itself are the basis of a nature-orientated tourism industry of considerable economic importance.

There is need to mitigate impacts of disturbed water flows caused by dams including to the Kafue Flats; to Mana Pools - an areas which has been described as globally outstanding in terms of biodiversity - but is negatively impacted by the Kariba dam; and to the Zambezi delta which impacted by the Cahora Basa dam. Other specific threats in the lower catchment are increasing land use changes and pollution as a result of sugar cultivation. Further upstream, issues of water access are expected to become increasingly problematic and will provide an important challenge to the implementation of the SADC Protocol on Shared Watercourse Systems.

WWF Project: Kafue Flats

Lake Malawi /Nyasa/Niassa

Size	216,000 km²
Countries	Malawi, Mozambique, Tanzania
WWF G200 status	# 182 - Rift Valley lakes # 88 - Central and Eastern Miombo Woodlands

Lake Malawi/Niassa/Nyasa hosts the richest freshwater fish fauna in the world, accommodating about 14% of the world's freshwater fish species (99% of which are endemic to the lake). The lake also supports some 188 species of mammals, 140 species of reptiles, and 90 species of amphibians. Although over fished and subject to increasing silt deposition in some parts, the lake is largely unspoiled, but its biota are extremely vulnerable to extinction as a result of ecosystems degradation or other threats.

A major reconnaissance study undertaken by WWF identified the following threats to biodiversity in the lake basin: poverty; population growth; habitat degradation and pollution; and overfishing. The lake is subject to increasing silt deposition in some parts - a result of poor land use practices in the catchment. The high level of dependence of most of the rural population on agriculture and fisheries has placed considerable pressure on natural resources, and in the case of Malawi - more densely populated than the other riparian countries - there has been a dramatic decline in the fisheries resources. Fishing pressure can have marked impacts on freshwater biodiversity as most fishing occurs in shallow water where diversity is greatest, leads to artificial selection and targets reproductive phases.

WWF Focal Freshwater ecoregion, much of the catchment also falls within the Moimbo, a focal terrestrial ecoregion.

Oilfants

Size	54,475 km^2
Countries	South Africa, Mozambique
WWF G200 status	# 105 - Drakensberg Montane Shrublands & Woodlands

The Drakensberg escarpment catchment complex in the north-east corner of South Africa combines huge biodiversity richness with spectacular scenic beauty and the world's third largest canyon, along the Blyde River, attracting almost one million tourists annually. The area - which includes the upper catchments of several rivers including the Olifants, Blyde Sand and Sabie rivers - is vitally important for the supply of adequate safe water supplies to a large, mainly rural population, intensive agriculture to the west and the Kruger National park to the east, as well as for the maintenance of transboundary river systems flowing through the National Park to Mocambique.

This forms part of the Wolkberg centre of biodiversity, and contains some of southern Africa's most species-rich habitats, including more than 70 percent of all bird and mammal species found in South Africa. The escarpment region of the Blyde and Sand catchments alone contains over 140 endemic species of plant, reptile, amphibians and invertebrates. The Mariepskop botanical reserve within this complex contains around 2000 plant species – more than the whole of the Kruger National Park and on par with Cape Town's Table Mountain plant diversity.

The catchment complex also supports one of the densest rural populations in South Africa, totalling more than 750,000 people, many living in abject poverty. The growing needs of these communities, inappropriate land-use practices and poor management of conservation areas has resulted in the degradation of the natural resource base. Indigenous forest and woodland has in the past been cleared for commercial timber plantations, with negative impacts including encroachment of alien invasive species, reduced waterholding capacity and waterflows, erosion and sedimentation.

The plan for the complex is to restore the environmental health, especially freshwater functions, to provide a stable foundation for maintenance and enhancement of livelihoods based on sustainable natural resource management. There is vast potential for socio-economic development and poverty alleviation. The Kruger to Canyons: Water & Nature Initiative (WANI) has as its primary goal the mainstreaming of an ecosystem-based approach into catchment policies, planning and management, with a strong focus on landscape restoration and biodiversity conservation. The programme aims to conserve critical ecosystem functions and services that deliver bulk water supply for food and livelihood security. WANI will maintain and expand existing protected areas along the upper catchment of the north-east Drakensberg escarpment, integrating montane forest and grassland ecosystems with lower lying mixed woodland and savanna systems.

Pilot projects are underway to integrate forest remnants into a single conservation unit of 60,000ha, linking the escarpment to the lowland and the Kruger National Park/Greater Limpopo Conservation Area. This will become a new national park as the core of a 250,000ha UNESCO-proclaimed Canyons to Kruger Biosphere Reserve, building on a 4-year government-led study for integrated catchment management and land care practices. Other actions in phase one of WANI include alien eradication, restoration of freshwater ecosystem functions and forests, development of infrastructure and tourism facilities to enhance longer-term employment opportunities and economic benefits to a wide range of stakeholders. A guiding principle to achieving a sustainable future for the region is the adoption of participatory management approaches, allowing adjacent communities access and empowering them to monitor use and impacts to secure benefits.

The WANI programme is a partnership between the World Conservation Union (IUCN) and WWF, South Africa's departments of Environmental Affairs and Tourism, and Water Affairs and Forestry. Collaborative partnerships have also been forged with GtZ, IWMI, South African National Parks, Working for Water programme, African Resource Trust and other key relevant government departments at national, provincial and local levels. The programme has also catalysed strong ties with several international cooperation and research institutions.

Track II: Mountains and water

More than half of humanity depends on mountains for water to drink, to grow food and to generate power. In humid parts of the world, mountains provide 30 to 60 percent of the freshwater downstream. In semi-arid and arid environments this can rise to 70 to 95 percent. In Africa an estimated 250 million people rely on mountains to provide the water that they drink.[9] Mountains are often called nature's water towers. Because of their size and shape, mountains intercept air circulating around the globe and force it upwards where it condenses into clouds that precipitate the rain and snow and ultimately provide the water supply to the river basin.

Mountain habitats can be very fragile since the extreme contours of mountain slopes and plateaux make such surfaces very unstable. Mountain soils form slowly in the cooler highland temperatures, often in nutrient poor conditions, and as a result of the topography are poorly anchored and easily swept away.

Yet human activities also contribute to the fragility of mountain terrain. Unsustainable forestry and inappropriate farming practices, for example, can lead to deforestation. Typically in Africa as lowland agricultural land is absorbed by large scale farming or over population, small scale subsistence farmers begin to utilise the hill slopes by clearing forests for farms. Without trees and plant life to absorb water, runoff increases and soil erosion escalates. A doubling of water speed, for example, produces an eight- to sixteenfold increase in the size of particles that can be transported. The likelihood of avalanches, landslides and floods increases. The effects of any degradation of the mountain habitats is magnified in the lower areas of the river basin in the form of increased flooding, less consistent water flow, increased solid loads in the river and associated siltation as a result of erosion.

[9] www.mountains2002.org/files/pdf/factsheets/water-e.pdf

African mountains and highlands give rise to some of the world's great rivers including the Nile, Congo and Niger. The intrinsic importance of water courses to the people of Africa in this continent of extremes makes the continuing healthy and effective functioning of these high altitude habitats as sources of water a major and fundamental focus for any integrated river basin management approach. They are important for recharging groundwater which ensures a supply that fills wells, runs in taps, or can be collected from streams for a number of basic daily uses. Already, the world's water table is dropping fast, anywhere from one to thirty metres, sometimes more. In some places and in certain seasons, a drop of one metre can greatly affect peoples' access to safe, adequate water. Mountain wetlands are a crucial source of water and important for restoring and maintaining these water reserves.

The mountain and upland areas in Africa are also of great importance as ancient glacial upland refugia for unique plant and animal species.

Treating nature as the source of water and make better protection of our precious wetlands a priority. This is pivotal in any plans to deliver water, food and energy. It is proposed that in mountain and highland ranges that are major sources (by water volume) of four large African river and lake basins,

WWF will lead with five interventions, summarised below, that will:

1. Broker agreements between relevant national and provincial governments on how to best manage shared mountain catchments, including through better understanding of the hydrology of these mountain rivers;
2. Establish protected areas with local communities that mitigate key threats to water supplies and conserve key mountain catchments and wetlands;
3. Demonstrate mountain catchment conservation techniques that sustain livelihoods, diversify local economies, improve the quality and quantity of water supplies and/or food security in one or more sub-catchment projects in each mountain range;
4. Bring together existing mountain region conservation initiatives to better target existing aid and local resources;
5. Where existing water infrastructure is impacting on mountain river environments, review and modify their operations to mitigate their impacts, for example, by restoring fish passage and native fisheries.

Fouta Djalon / Cameroon highlands

Countries: *Guinea, Cameroon*

WWF G200 Status: *# 3 - Cameroonian Highlands Forest*

River: *Niger, Benue (major tributary to R. Niger)*

The catchment of the River Niger in Guinea, with its source near the border with Sierra Leone, represents only about 4% of the total basin area, the only part of the catchment to be classified as humid. At 1635 mm per annum, the average rainfall in Guinea is greater than the other Niger countries, and the Guinea headwaters of the Fouta Djalon Mountains and Monts Nimba provide some 40km^3 of water per annum to the river as it enters Mali. Here large amounts of water are "lost" through seepage and evaporation in the inland delta.

Mount Nimba is a World Heritage site, while the Government of Guinea has recently designated major areas of the River Niger headwaters, including the source, under the Ramsar Convention. The population is relatively sparse but deforestation is becoming a concern particularly near to major settlements. About 1,000 fishermen catch some 12 tons per annum in this part of the basin., mostly as a secondary activity. Illegal fishing with explosives and toxic mixtures is widespread, and is a concern for consumers as well as the environment.

The Benue has its source in Chad and is joined in the Cameroonian Highlands by several tributaries. Some 13-25 km^3 of water per annum enter Nigeria.

WWF Projects : Niger Basin Initiative, Gaskaka Gumpti National Park (Taraba catchment)

Udzungwa & Kipengere

Countries: *Tanzania*

WWF G200 Status: *Miombo*

River: *Great Ruaha and tributaries*

The Kipengere /Mpanga region, at 1800-2300 m in the South Highlands is one of the few areas in Tanzania receiving high rainfall. The Ikowo and Mpanga floodplains regulate the flow and groundwater recharge to the perennial rivers of Kipera, Mpanga, Kimani, Mlomboje and Mbarali. These in turn feed the Usangu wetlands which store and release water to the Great Ruaha.

As well as being of critical importance to the downstream areas, the region, and in particular the national park, provide a dry season refuge to wildlife. The area is a meeting point of Eastern and Southern African species, with high species richness as well as several rare species such as the Denhams bustard. Recent problems in this relatively sparsely populated area include slash and burn agriculture by immigrants from elsewhere in Tanzania, as well as an increasing influx of pastoralists with associated problems of soil compaction and erosion.

Udzungwa Mountains National Park (UMNP) is located in south central Tanzania, and forms part of the greater Selous ecosystem that encompasses some of Tanzania's most important grasslands, woodlands and forest, with wildlife species found nowhere else in the world. The park provides one of the essential catchment areas for major rivers of southern Tanzania: eleven rivers from Udzungwa drain into the Ruaha River in the northern part of the park (Msosa, Lukosi, Lofya, Mhalaga, Mhuka, Msinga, Malenga Makali, Mgalange, Datha and Modshagon). These rivers provide water for sugar cane plantations, rice fields and horticultural gardens just below the mountains as well as flood plains and irrigated fields used by thousands of farmers down stream. An additional twenty-seven waterways in the south of the park (e.g. Lumemo, Ruipa, Sanje, Kihansi, Sonjo, Mwaya, Ichonde, Kisawasawa, Kiberege, Kinyungu, Idete, Warubungo and Mgeta) act as tributaries to the Kilombero River which along with the Great Ruaha, is a tributary of the Rufiji River.

WWF Projects
- Kipingere Water Catchment Reserve.
- Udzungwa Mountains National Park

Chari River

Countries: *Central African Republic, Chad*

WWF G200 Status: # 97 - Sudd-Sahelian Flooded Savannas
89 - Sudanian Savannas

River: *Chari*

The River Chari together with it's tributary, the Logone, provide some 95% of the water flow into Lake Chad. Three quarters of the River Chari flow originates in the headwaters of the Chari, but this volume has declined considerably due to reduced rainfall in the past decades. The headwaters in CAR (Central Africa

Republic) cover 35% of the national territory, some 215,000 km^2. The area is home to some one million people.

Land use is dominated by pastoralism in the North-west, and wildlife utilisation (sport hunting) in the North-east where large areas are designated as national parks. Security in the area is very poor and in recent years, cross-border poaching and unplanned settlements have had serious impacts on wildlife areas.

Baviaanskloof Range

Countries: *South Africa*

WWF G200 Status: *Cape Fynbos # 118*

River: *Baviaanskloof, plus Grootrivier, Kouga rivers which combine to form the GamtoosRiver*

The Baviaanskloof protected area straddles two east-west running mountain ranges - the Baviaanskloof to the south and the Kouga to the north - about 35km from the Indian Ocean, and 75km northwest of the city of Port Elizabeth. This is a vitally important catchment area for the eastern Cape, responsible for the water supply for the Nelson Mandela metropole and agricultural areas around Port Elizabeth, containing approximately two million people. This is a relatively arid region, and the Baviaanskloof averages only 500mm annually, which can fall irregularly, leading to drought conditions. Average temperatures are 32°C in January (summer), and 18°C in July (winter).

Identified as one of three potential mega-reserves to underpin conservation of the priority Cape fynbos ecoregion, the Baviaanskloof is exceptionally rich in biodiversity. Representing two phytogeographic centres of endemism, and located in a transition zone between four major floral regions, and six of South Africa's seven biomes, this area contains both ancient and relatively recently evolved taxa, including cycads (*Encephalartos spp*). Over 1160 flowering plant species are recorded - including 20 endemic to the area, as well as 58 mammals, 17 amphibians, 55 butterflies, and 15 fish. More than 300 bird species have been recorded, representing one-third of South Africa's total, and the area is ranked as a Globally Important Bird Area. Twenty of the 56 recorded reptile species are South African endemic.

Human occupation of the area dates back to at least the Middle Stone Age (100,000 to 30,000 years before the present), and the 2,000 year-old mummified remains of a San bushman have been found, together with a wealth of rock art and artefacts.

Nominated as a World Heritage Site, the Baviaanskloof is sufficiently large and undisturbed to enable natural processes such as fire regimes, essential for the maintenance of biodiversity, to function without intensive management interventions. Threats to the area are not severe. Invasive vegetation is limited to the upper catchments, where clearing is underway, while there is also clearance of fynbos for agriculture, overstocking & overgrazing, and over-frequent fires. Uncontrolled, these threats can block and silt waterways, reducing water quantity and quality, and affecting all the other values of the area.

There are plans to expand the current protected area up to 500,000ha, to realise the Baviaanskloof's conservation, tourism, and water catchment potential, the activities of which will generate enough sustained employment to turn around the collapsed regional agricultural economy. This will include establishment of a steering committee representing all stakeholders

WWF South Africa is engaged in the Baviaanskloof conservation initiative through the work of Table Mountain Fund. The Baviaanskloof conservation area has become one of the flagship projects for the Cape Action Plan for the Environment, (CAPE).

Implementation

As the world's largest independent environmental NGO, with field activities in almost 100 countries, WWF will bring to the WWF Basin Programme particular skills and attributes that will make a critical difference:

- WWF is a global, multi-cultural NGO that has over four decades of experience in freshwater conservation, policy and sustainable development work;
- WWF communicates and works effectively to link work at the local, national, regional and international levels, bringing together governments and other stakeholders to find solutions to common problems;
- WWF is a pragmatic and solutions oriented organisation that has a track record of successful partnerships with stakeholders, governments and international institutions;
- WWF learns from its work, documents the lessons and applies them in international policy and new field programmes;
- WWF has extensive experience of project planning, management, monitoring, evaluation and accountability in developing nations.

Individual interventions will be implemented by WWF's network of Programme Offices, National Organisations and Associates in the Africa Region[10] and our government and non-government partners. WWF will also bring to this programme the expertise of its global network of freshwater experts.

A guiding principle for the WWF basin programme will be the fostering and/or enhancement of enduring partnerships at all levels. WWF will work with major actors such as the Global Water Partnership, the partners of the Dialogue on Water, Food and Environment, and IUCN's Water & Nature Initiative, to ensure compatibility and to focus on value added. Within each basin, WWF will carry out a stakeholder analysis as a basis for developing appropriate links with existing IRBM-related activities and to ensure participation of key stakeholder groups.

Further detailed plans for this initiative and each intervention will be prepared with the local WWF offices and our government and non-government partners in conjunction with the donor(s).

Budget

This is an ambitious and challenging Programme. Based on similar interventions undertaken by WWF and partners, we anticipate that the funding required for this programme will be approximately USD 70 million over the 5 years required to ensure local mechanisms supported by these interventions are sufficiently well established to become sustainable. WWF and our government and non-government partners have substantial investments in the selected basins through existing projects and programmes.

The additional funding required is based on six river basin interventions that each requires an additional USD1.5 million per year and five mountain catchment interventions that each requires USD1 million per year, for a total of USD14 million per year.

For more information

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[10] WWF Programme Offices for Eastern Africa, Western Africa, Central Africa, and Southern Africa, WWF South Africa, and WWF's Associate, the Nigerian Conservation Foundation, will supervise the individual interventions. Country offices in Cameroon, Central African Republic, Zambia, Mozambique, and Tanzania will also be involved.