Workshop Report

Climate change and transboundary water resource conflicts in Africa

Edited and compiled by Dr Debay Tadesse Woldemichael

29–30 September 2009, Mombasa, Kenya

Contents

Acronyms and initialisms

ACMAD	African Centre of Meteorological Applications for Development
ADIE	L'Agence Internationale pour le Développement de l'Information
AMCOW	African Ministerial Council on Water
AMESD	African Monitoring of Environment for Sustainable Development
ANBO	African Network of Basin Organisations
ASALs	Arid and Semi-Arid Lands
CAHOSCC	Conference of African Heads of State and Government on Climate Change
CCCDF	Canada Climate Change and Development Fund
CEDARE	Centre for Development for the Arab Region and Europe
CEDEAO	Communaute Economique des Etats de l'Afrique de l'Ouest (Economic Community of West African States , ECOWAS)
CEEAC	La Commission Economique des Etats d'Afrique Centrale
CEFDHAC	La Conférence sur les Écosystèmes de Forêts Denses et Humides d'Afrique Centrale
CEMAC	La Communauté Economique et Monétaire d'Afrique Centrale
CFA	Cooperative Framework Agreement
CICOS	Commission Intérnationale du Bassin Congo-Oubangui-Sangha
CIDA	Canadian International Development Agency
CILSS	Comité permanent Inter-Etats du Lutte contre la Sécheresse du Sahel (Permanent Interstate Committee for Drought Control in the Sahel)
CIRDES	Centre International de Recherche-Dévellopement sur l'Elévage en Zone Subhumide (Research-Development International Centre for Husbandry in Sub-Humid Area)
COMESA	Common Market for East and Southern Africa
COMEST	Commission on the Ethics of Scientific Knowledge and Technology
COMIFAC	Central African Forests Commission
COMIFAC	Commission des Forêts d'Afrique Centrale
CPCS-GIRE	ECOWAS Permanent Forum for the Coordination and Monitoring of the Integrated Management of Water Resources in West Africa
EAC	East African Community
ECA	Economic Commission for Africa
ECOWAP	ECOWAS Common Agricultural Policy
ECOWAS	Economic Community of West African States
ENSAP	Eastern Nile Programme
GEF	Global Environmental Facility
GIEC	Groupe D'experts Intergouvernementals sur L'evolution de Climat
HYCOS	Hydrological Cycles Observation System
ICCON	International Consortium for Cooperation on Nile
ICJ	International Court of Justice
ICPAC	IGAD Climate Prediction and Application Centre
IGAD	Inter-Governmental Authority on Development
ILA	International Law Association
ILBM	Integrated Lake Basin Management
ILEC	International Lake Environment Committee Foundation
IUCN	International Union for the Conservation of Nature
IWRM	Integrated Water Resources Management
KBO	Kagera Basin Organisation
LBDA	Lake Basin Development Authority (Kenya)
LCBC	Lake Chad Basin Commission
LDCs	Least Developed Countries
LUCOP	Programme de Lutte contre la Pauvreté
LVBC	Lake Victoria Basin Commission
MDGs	Millennium Development Goals
MDP	Mécanisme pour un Développement Propre
NAPAs	National Adaptation Programmes of Action
NBA	Niger Basin Authority
NBC	Nile Basin Commission

NBI	Nile Basin Initiative
NELSAP	Nile Equatorial Lakes Programme
NEMA	National Environment Management Authority (Uganda)
NEPAD	New Partnership for Africa's Development
Nile-COM	Council of Ministers of Water Affairs of the Nile Basin States
NRBC	Nile River Basin Commission
OAB	L'Organisation Africaine du Bois
OCFSA	L'Organisation pour la Conservation de la Faune Sauvage d'Afrique
OMVS	Organisation pour la Mise en Valeur du fleuve Sénégal (Organisation for Development of Senegal River)
ORASECOM	Orange-Senque River Commission
OSS	Observatoire du Sahara et du Sahel
PAE NEPAD	Plan d'Action Environnemental du
Nouveau	Partenariat pour le Développement de l'Afrique
PAFN	Programme d'Action pour la Forêt Naturelle
PANA	Programme d'Action Nationale pour l'Adaptation aux Changements Climatiques
PASDEP	Plan for Accelerated and Sustained Development to End Poverty
PCIJ	Permanent International Court of Justice
PFNL	Produits Forestiers Non Ligneux (Non Timber Forest Products
PGRN	Programme de Gestion des Ressources Naturelles
POPC	Plan d'Opérations Triennal du Plan de Convergence
RAPAC	Réseau des Aires Protégées d'Afrique Centrale
RECs	Regional Economic Communities
REPAR	Réseau Des Parlementaires Pour La Gestion Durable Des Écosystèmes Forestiers d'Afrique Centrale
RLBOs	River and Lake Basin Organisations
ROPPA	Network of Peasant Organizations and Producers in West Africa
RTAs	Regional Transboundary Agreements
SEMIDE	Système Euro-Méditerranéen d'Information sur les Savoire-Faire Dans le Domaine de l'Eau, or Euro-Mediterranean Regional Programme for Local Water Management
SPLA	Sudan People's Liberation Army
TECCONILE	Technical Cooperation Committee for the Promotion of the Development and Environmental Protection of the Nile Basin
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNW-DPC	United Nations Water Decade Programme on Capacity Development
WAEMU	West African Economic and Monetary Union
WAHO	West African Health Organisation
WARF	West Africa Rural Foundation
WGC	Water Governance Concepts
WMO	World Meteorological Organization
WRCU	Water Resources Coordination Unit (ECOWAS)

Background

Debay Tadesse
Senior Researcher (ISS)

Climate change has been identified as a leading human and environmental crisis of twentieth-century Africa. Understanding climate change or global warming is one of the major problems confronting African people. Governments and the community seem to be at a loss when the neglected issue of climate change is raised in public. Moreover, climate change possibly leads to acute conflict and it is imperative to have a proper understanding of this phenomenon. Climate change means environmental modification that occurs as a result of human activities that lead to the release of carbon dioxide into the Earth's atmosphere from the combustion of fossil fuels. The major portion of carbon dioxide release in Africa is contributed from burning fossil fuels and cutting down tropical forests to facilitate agricultural production, as well as felling timber for industry, domestic and abroad. Concern over the negative impact of climate change has strengthened fears that environmental degradation and demographic pressures will displace millions of people in Africa and create a wake of social upheaval.

WATER SCARCITY

Water scarcity has attracted the attention of Africa and the international community and is considered one of the major environmental issues of the twenty-first century. On 22 March 2001, the United Nations commemorated World Day for Water, at which speakers concluded that demands for freshwater had already exceeded supplies by 17 per cent and that over the next 25 years, two thirds of the world's population will experience severe water shortages. In addition, the World Resources Institute in Washington DC has warned that the world's freshwater systems are in peril. It predicts that by 2025 about a billion people or nearly 50 per cent of the world's population will face water scarcity.[1]

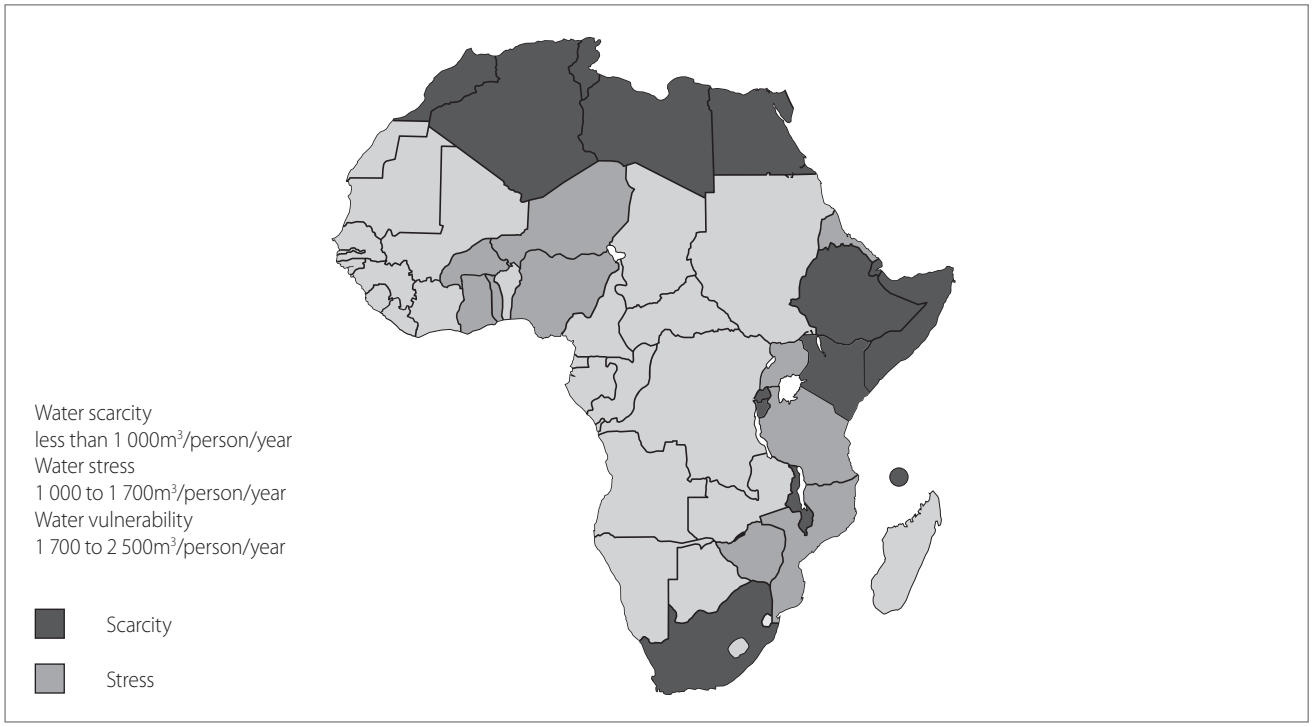
The Nile (6 825 km or about 4 266 miles) is the longest river basin in the world in terms of both drainage area and the quantity of water it carries in its course, which is estimated at 84 billion m^3 of water. The Nile has more riparian states (Burundi, Egypt, Ethiopia, Eritrea, Kenya, Republic of Congo, Rwanda, Sudan, Tanzania, and Uganda) than any international river basin in the world. While other countries may have alternative energy sources, a significant percentage of the peoples of these states depend directly on the Nile River for their livelihood and as a source of energy for industrial and domestic needs.

A recent study suggests that within 25 years, because of population growth and economic development, almost one in two people in Africa will live in countries that are facing water scarcity or 'water stress'. Water scarcity is defined as less than 1 000 m^3 of water per person per year, while water stress means less than 1 500 m^3 of water per person per year. By 2025, according to the report, 12 more African countries will have joined the 13 that already suffer from water stress or water scarcity.[2]

Moreover, Lester Brown, the influential head of the environmental research institute Worldwatch, believes that water scarcity is now 'the single biggest threat to global food security'. He states that if the combined population of the three countries that the Nile runs through (Ethiopia, Sudan and Egypt) rises as predicted from 150 million today to 340 million in 2050, there could be intense competition for limited water resources.[3] There is already little water left when the Nile reaches the sea.

The increasing water intensity of modern development, including irrigation and hydroelectric power, has raised the stakes on sharing and common use. To date, no comprehensive agreement on the use of the Nile water binds the riparian states, and no significant integrated planning

Figure 1 Freshwater stress and scarcity in 2025



Source 4th Water Forum –Africa

has been carried out to develop the basin. The few agreements between riparian countries that exist are between Egypt and Sudan, to the almost total exclusion of the others. Unless basin-wide water development planning is considered a viable solution to conflict resolution and poverty reduction, such increasing water scarcity is likely to generate more regional conflicts in the Nile Basin. Conflicts on the continent, whether inter- or intra-state, are highly destructive and have brought about unspeakable humanitarian catastrophes. Most scholars argue that water shortages in international river systems cause conflict and perhaps war. Thus helping to end the water problems may reduce the possibility of conflict.

WATER AND FOOD SECURITY

Water and food security are closely related. Reliable access to water increases agricultural yields; lack of it can be a major cause of droughts, famine, undernourishment and conflict. One reason for environmental degradation and recurrent drought and famine in this region is lack of water management. An important strategic plan for overcoming the problem of recurrent drought and famine, as well as environmental degradation, is to concentrate on developing the water resources. There is plenty of water in Africa: the problem is that in many cases it is in the wrong place or available at the wrong time.[4] The political and economic history of Africa is filled with contradictions and paradoxes, where abundance in natural resources is more of a curse than a blessing, a major source of conflict rather than cooperation.

ENERGY SECTOR IN SUB-SAHARAN AFRICA

Sub-Saharan Africa faces major infrastructural challenges, the most severe of which are probably those in the power sector. Not only is the region's energy infrastructure meagre compared with other regions, but electricity services are costly and unreliable. Indeed, in recent years more than 30 of the 48 countries in the region have suffered acute energy crises. 'The entire generation capacity of the 48 countries of sub-Saharan Africa, at 63 gigawatts (GW), is comparable to that of Spain. If South Africa is excluded, sub-Saharan African generation capacity falls to only 28 GW.'[5] According to recent experience, in some cities the electricity situation is worsening as a result of urban growth, in addition to old and badly maintained installations. Power cuts are frequent and sometimes long lasting, leading to loss in national revenue.

What solutions have been proposed to the obstacles to development that lack of electricity brings? The situation could be alleviated by tapping into the continent's huge potential for developing renewable energy sources, including hydro, solar, wind and geothermal power. Electricity and oil are critical energy inputs in a developing economy as they contribute greatly to the production process. Energy for rural development has been an issue of national interest for some time and received significant

attention in most developing countries in the last three decades of the twentieth century.[6] In June 1992, 41 African countries endorsed Agenda 21 as a comprehensive international framework and action programme for sustainable development at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro.[7]

However, rural energy initiatives in sub-Saharan Africa have remained undefined and largely unattended to – owing to financial resource constraints and low levels of technological advancement – or simply neglected. The rural energy problem in this region will continue to be one of the chief causes of underdevelopment, conflict and poverty unless it is addressed. Without energy, there can be no development or effective fight against poverty. Whether the problem concerns rural electrification, inadequate infrastructure or lack of energy in the towns, it prevents social and economic development. Therefore, policy makers must take the initiative to ensure a future in which access to energy is assured. Meanwhile, the European Union is working through its EU-Africa Energy Partnership to bring electricity to sub-Saharan Africa. Europe obtains a significant amount of energy from oil refined in African countries, and some governments have agreements by which aid will go towards developing energy resources.

CLIMATE CHANGE AND ITS IMPACT ON PASTORALISM

Climate change and the livelihoods of pastoralists are interlinked. Pastoralist communities depend largely on livestock. Pastoralism is practised in delicate and insecure environments, characterised by highly spatial and temporal rainfall distribution which often leads to a long dry spell. Variability in the weather pattern as a result of climate change has major implications for pastoralist livelihoods and security. Threats from climate change, particularly persistent drought, have devastating consequences. Severe droughts affect water resources and have led to the death of large numbers of livestock in most pastoral areas. Therefore, current climate change and the antecedent ecological changes will have significant negative effects on the pastoralists and their livelihood unless effective and sustainable intervention measures are put in place.

Pastoralists live in a hostile and arid environment. These regions are prone to frequent drought, yet governments in Africa have done little to improve their standard of living, although the livestock sector contributes about 12 per cent to national economies. Many areas lack good road networks and basic services such as clean water, security, schools, hospitals, administrative centres and livestock markets. The effects of drought, low precipitation, and high temperatures induced by climate change, as well as the incidence of diseases and pests, affect availability of pasture and water supplies for livestock, which are critical to the survival of livestock and pastoralists.

LEGAL, POLICY AND INSTITUTIONAL CHALLENGES

Recognising the tremendous benefits that can be reaped from cooperation, yet being fully aware of the challenges ahead, various regional and sub-regional initiatives have attempted to mitigate the water-related conflict that is prevalent in Africa. These include the ENDUGU group; the TECCONILE Initiative; and the Nile Basin Initiative. The ENDUGU group was initiated by Egypt to promote its interests on the Nile, but could not overcome the financial, political and other problems it encountered and is no longer active. The Technical Cooperation Committee for the Promotion of the Development and Environmental Protection of the Nile Basin (TECCONILE) was initiated in 1993. Under the auspices of TECCONILE and with the support of the Canadian International Development Agency (CIDA), a series of 10 Nile 2002 conferences was launched in 1993 to provide an informal mechanism for dialogue among the Nile Basin countries and with the international community.

Knowing that sustained cooperation on the Nile requires a permanent institution with a development focus and agreement on core legal principles, the Nile Basin countries established a forum for a process of legal and institutional dialogue in 1997. The transitional mechanism was officially launched in February 1999 in Dar es Salaam by Nile-Com. In May 1999, the overall process was officially named the Nile Basin Initiative (NBI). The NBI, which is supported by the UNDP, World Bank and other donors, includes the ten Nile riparian countries as equal members in a regional partnership to promote economic development and fight poverty throughout the basin. Its vision is 'to achieve sustainable socio-economic development through the equitable utilisation of, and benefit from, the common Nile Basin water resources'.

In the last three decades the frequency of droughts in Nile Basin riparian countries has increased, and arid and semi-arid lands have become deserts. Under these harsh conditions, competition for scarce water resources is intense, especially where these resources are less developed and are shared by other countries. In addition, the task ahead is much more difficult and complex because of the mutual mistrust and suspicion that have characterised relations among riparian states over the development of the Nile waters. Allocating water resources to meet basic human needs, including social and economic development, while maintaining the integrity of aquatic

ecosystems, should be the priority of the Nile basin riparian states.

INSTITUTIONAL CHALLENGES AT THE AFRICAN UNION LEVEL

Although climate change is one of the most significant challenges facing Africa, the AU response to climate change remains insufficient. However, in recent years, early signs of an AU climate change regime have emerged, but face several obstacles, such as conflicting needs and interests of member states, and the result has been little progress towards implementing national climate change policies. Moreover, among areas for priority attention, the Abuja Summit included accelerating progress towards complying with the AU and NEPAD 2003 Maputo Declaration commitment to allocate at least 10 per cent of national budgets to agriculture and rural development by 2008.

It was also argued that investment should target activities that foster the greatest and earliest gains in productivity and competitiveness, that is, infrastructure (particularly roads, ports, storage and market structures); water control (irrigation capacity on appropriate scales); and creation of an appropriate environment to encourage the private sector (both large and small scale) to invest. In addition, Africa has adequate core resources to implement priority food and nutrition security interventions at national, regional economic community (REC) and continental level. If well implemented and if focused on a few strategic food security and exportable products, Africa's own investment can create the necessary momentum and absorption capacity to effectively use additional public and private external inflows of funds into African agriculture.

Africans' recognition of the important linkage between water, food security, environment, peace and security and stability on the one hand and development and cooperation on the other urged them to undergo a paradigm shift in their response to the many threats to the peace and security and stability of African states.

OBJECTIVES AND PURPOSE OF THE WORKSHOP

This workshop examines the trends in environmental stress associated with water resources and addresses issues related to transboundary water conflicts as well as the challenges for future water-related development projects, including the energy sector in this region. Utilising water efficiently is crucial in order to provide adequate water for agriculture and livestock development and for human consumption. However, because of the population growth, migration, and over-grazing that have contributed to deforestation and land degradation, many countries in sub-Saharan Africa are experiencing serious water shortages, coupled with environmental degradation. To these must be added the effects of drought and desertification, which are developing at an alarming pace in some areas. The major problem in this region is not industrial pollution, but the depletion of its natural resources, including water and forests. This poses a major human security threat to present and future generations of Africa and the world.

To date, few concrete studies and materials have been produced on the scarcity of water resources and its attended consequences of conflict in Africa. Thus this roundtable workshop will help to fill the gap. Besides, this conference will promote innovative research and produce a timely workshop report that will be useful for African policy makers and development planners.

Therefore, the roundtable workshop brings together experts from academia; governments, including representatives of ministries of foreign affairs, water resources and wildlife; think-tanks; non-governmental organisations; intergovernmental agencies, RECs as well as water experts and the Nile Basin Initiative with aim of:

- Enhancing understanding of transboundary waters and conflicts
- Improving cooperation and coordination among AU member states and regional organisations
- Contributing to an appropriate water policy and addressing the issue of cooperation, which will enable a win-win solution
- Contributing to the development of an appropriate water legislative and regulatory framework to regulate transboundary water and climate change policies at national and regional level.

Additionally, the workshop will consider how key international actors such as UNDP, UNEP and World Bank could play effective roles in preventing and managing transboundary water resource conflicts. Then it will look into the role of civil societies in Africa in managing and resolving water conflicts.

Its objectives will be to develop a strategy and influence policy options that enhance the role of environmental agencies, the Nile Basin Initiative, governments, intergovernmental agencies, non-governmental organisations (NGOs) and civil society organisations in preventing, managing and resolving water resource conflicts. The conference examines these themes:

- Past achievements of the NBI
- Impediments to sustainable and basin-wide cooperation in the Nile River Basin

- Role of government and NGOs in the endeavour towards joint management and operation of water shortages in the region
- The unacceptably high level of food insecurity in Africa (27 per cent), despite a wealth of stakeholder consultations, plans, recommendations, commitments and declarations
- The impact of climate change, cooperation, development, peace and stability in Africa.
- Alternative models for a coordinated water development project, including energy and irrigations in the Nile Basin riparian states.
- The regulation of the Helsinki Rules
- Non-water issues such as economic, environment, political and even joint military/collective security cooperation that could lead from single-good to multi-good agreements
- Drought, pastoralist practices and migrations.
- Formalisation, adoption and implementation of national climate change policies

NOTES

1 Baba Galleh Jallow, In 25 years, half the world will be short of water, 21 March 2001, allAfrica.com, accessed 29 December 2009.

2 Ibid.

3 Lester R. Brown, *When population growth and resource availability collide,* available at http://www.populationpress.org/publication /2009-1-brown.html (accessed September 2009).

4 Tvedt Terje, The management of water and irrigation: The Blue Nile, in M Doornbos, L Cliffe and Ahmed Abdel Ghaffar (eds), *Beyond conflict in the Horn: Prospects for peace, recovery and development in Ethiopia, Eritrea, Somalia and Sudan*, London: James Currey, 1992, 27.

5 IMF, *Regional economic outlook: Sub-Saharan Africa,* Washington: IMF, April 2008, 74.

6 D F Barnes, *Electric power for rural growth: How electricity affects rural life in developing countries*, Boulder: Westview, 1988, 71.

7 Ronald G. Cummings, *Inter-basin water transfers: A case study in Mexico* (Washington, DC: Resources for the Future Inc Press, 1974), 2.

Opening remarks

Roba D Sharamo

The workshop began with a note of welcome from Mr Roba Sharamo, Acting Director, Institute for Security Studies (ISS), Addis Ababa Office. With its commitment to promoting human security, especially a collective people-centred concept of security, the ISS, through its African Conflict Prevention Programme in Addis Ababa, had organised the roundtable with a view to addressing the issues of climate change and transboundary water resource conflicts in Africa. Mr Sharamo thanked the authors and participants for taking time to contribute and share their experiences and ideas at this critical conference that was envisaged to promote cooperation in combating climate change and enhance effective management of conflicts about the utilisation of transboundary resources. Outlining the objectives of the roundtable, Mr Sharamo drew participants' attention to the challenges and opportunities faced by the Nile Basin riparian states in particular as well as other transboundary water conflicts in Africa. Grounded in the context of climate change, Mr Sharamo stressed that the objective of the roundtable discussion was to contribute to policy options for informed and effective policy making, political negotiations and cooperation among the Nile Basin riparian states. He expressed the hope that during the conference, participants would address effective policy making on climate change, examine trends of environmental degradation, and review associated conflicts and cooperation over the use of transboundary water resources, particularly the Nile.

Emphasising that climate change is no longer a myth, but a reality, Mr Sharamo pointed out that worsening climatic conditions could trigger social, political and economic conflicts that would threaten the stability of communities and nations. He pointed out that climate change manifests not only through increased temperature, but also through recurrent and excruciating droughts, famine, food shortages, skyrocketing food prices, shrinking water levels of dams and related power shortages, increasing pastoralist conflicts among themselves and against agricultural communities, and wildlife deaths and migrations. Undoubtedly, unchecked negative climatic changes will undermine societal, national, and regional security in Africa. Since this conference comes at a time that talks about dire consequences and negotiations about climate change dominate global media, nations must reflect critically on the state of their natural environments, climate change policies and mechanisms for enhanced cooperation in managing and utilising transboundary resources.

The speaker commended the participants from embassies, governments, academia and civil society for making proactive efforts to discover the impediments to sustainable and basin-wide cooperation, and to examine the role of governments and non-government organisations in establishing joint management of transboundary water resources in the region. Such collaborative frameworks will enhance the region's capacity to mitigate the negative impacts of climate change, bolster political cooperation and economic development, and thereby promote regional peace and stability in Africa.

Concluding his remarks, Mr Sharamo stated that after many years of negotiations and debates over transboundary water conflicts, the ISS had hosted this gathering in order to discuss the possibilities of strengthening and enhancing understanding of transboundary water-resource-based conflicts in the region. Hence, Mr Sharamo hoped that the papers presented and subsequent discussions would enhance cooperation and collaboration of nation states in the effective management and utilisation of transboundary water resources. Such frameworks would not only enhance peace and security, but would also usher in economic development – for the advancement of the African continent.

Keynote address

John Rao Nyaoro
Director of Water Resources

on behalf of

Hon Charity Kaluki Ngilu
the Minister Of Water And Irrigation

Distinguished guests, fellow participants, the organisers, ladies and gentlemen; first, I want to take this opportunity to welcome all of you to Kenya and to thank the organisers for choosing Kenya to host this important event. This workshop has come at a time that many countries in Africa and the world at large are experiencing the devastating effects of climate change. Climate change is real and its effects on transboundary waters will be far-reaching, especially in Africa. Africa has a number of transboundary waters.

Climate change is bringing more droughts than were initially anticipated. Currently in Kenya some parts of the country have missed two to three consecutive rainy seasons that have made life in the arid and semi-arid lands unbearable. Urban cities are not spared either because water is already being rationed in most of our cities. For instance, in Nairobi, which is the country's capital, we are forced to ration water because the main sources of water (that is, dams and aquifers) have not been sufficiently replenished owing to failed or erratic rains.

Climate change will result in reduced rain in some seasons and heavy storms in others, and only in some parts of the country. These are occurring now in Kenya, whereby the Lake Victoria Basin, which is the upper headwork of the Nile River Basin, is experiencing enhanced short rains, while Rift Valley, Central, Eastern and North Eastern provinces are suffering the worst drought for the last 40 years. To us, the only immediate solution to this problem is put strategies in place that will ensure that we harvest all the flood flows whenever they occur, in dams and pans, and channel these to the areas experiencing drought. This strategy may mean having inter-basin and intra-basin transfers. With climate change, states can no longer rely on rain-fed agriculture. In Kenya, for example, we have come up with a policy that will increase our water storage from the current low of 4,5 m^3 per capita to 25,0 m^3 per capita by 2030 in line with the country's vision for 2030.

As well as the effects of greenhouse gases, climate change in Kenya has been exacerbated by population increase, which has led to encroachment of fragile water catchment areas in search of firewood and more arable land for agriculture in order to produce more food, as well as the logging of indigenous trees. Poor land policies – or the lack of – have meant that inappropriate land use has worsened the climate change situation. This has resulted in reduced river flows, with most of the rivers becoming seasonal. Though the land policy was reviewed recently in order to assist in sustainable land use and protection of water catchment and water sources, more will have to be done to ensure that the five water towers are conserved and are not subject to activities that are destructive to the catchments.

The other pressure on water resources is water pollution, which is currently a big challenge to water resource management. Discharge of raw or partially treated effluent into water bodies is a threat to freshwater resources. Rivers traverse urban areas, especially informal settlements, where raw sewers are discharged directly into the water and have rendered such waters unusable. Industrial effluent, especially from tanning, paper and coffee pulping, is the main source of water pollution in most developing countries.

Recent water sector reforms in Kenya created institutions to manage water resources and ensure that sanitation facilities are provided in urban centres and informal settlements areas. These will ensure control of raw sewers and subsequent treatment to required standards before effluent is discharged into water bodies. The polluter pays principle has been introduced whereby industries that

pollute water bodies are taxed to clean up their mess. Kenya's Water Act 2002 (Act 8 of 2002) provides for stiff penalties, which include jail terms for managers of companies that pollute water bodies. In addition, water legislation provides for riparian land along the watercourses where activities that are detrimental to water bodies are not allowed. This effort is being used to clean up Nairobi River, which is completely polluted.

Owing to the scarcity of freshwater resources there is already water conflict among water users. Groups such as the pastoralists that by nature inhabit the downstream plains often clash with the agrarian communities who inhabit the upper reaches. Traditionally the pastoralists believe that the first priority for water is for their animals; hence in times of drought the upstream dwellers should let water flow past them in order to reach the pastoralists' cattle. This has not gone well and often the government has had to intervene. The government is currently faced with the challenge of implementing and enforcing the laws (the Water Act and the Environmental and Management Coordination Act (EMCA) 1999) that provide for equitable allocation of water resources. Further, the government has facilitated the establishment of local water resource users associations that act as arbitrators in the event of conflict. This situation obtains in many parts of the continent where water scarcity is obvious.

Ladies and gentlemen, may I also shed some light on transboundary water politics. Kenya is among the upstream states in the Nile Basin. It was under British administration until 1963, when it attained independence. During the colonial administration a number of agreements on the Nile were signed between Egypt and the UK, such as the 1929 agreement, which has been viewed as protecting the interests of the more developed downstream riparian states at the expense of the underdeveloped upstream states.

Kenya believes in peaceful coexistence with its neighbours, irrespective of the differences that may occur. It prefers diplomacy as the best way of resolving differences among states. This was recently manifested in the way in which it handled the Migingo Island issues in the shared waters of Lake Victoria. The approach to the shared waters in the Nile Basin is the same. However, the protracted consultations on the Nile Basin collaborative framework are causing anxiety and displeasure. Towards this end, Kenya expects the downstream riparian countries of Sudan and Egypt to cooperate and understand that their water needs are best served through cooperation and conservation of the Lake Victoria Basin catchment. Kenya would like to see the downstream riparian countries contributing meaningfully to conserving catchment in the upper riparian states. Therefore, Kenya wishes to see this framework swiftly concluded and operationalised to save Lake Victoria and assure the livelihood of the 15 million habitants on its side of the basin. Towards this end, Kenya has also engaged Ethiopia on the conservation of Lake Turkana and the subsequent development in the basin.

The downstream states are apparently keen only to foster their development agenda with less interest in that of the upper states, which are still languishing in poverty and are in dire need of development.

Conditions for shared water resources that have been set by development partners require riparian states to obtain consent from other riparian states for new projects or planned measures. These are also seen as favouring the developed states, which cling to the status quo to continue to enjoy these resources at the expense of the underdeveloped.

There is therefore a need for cooperation to ensure peaceful and sustainable development of transboundary waters. In its effort to foster cooperation with its neighbours, Kenya has developed a transboundary water policy to assist in the appropriate management of its shared waters.

With those few remarks, may I wish you fruitful deliberations on this subject.

Thank you for your attention.

Session I

Current conflict and cooperation on transboundary water resources

The case of the Nile River Basin

Review of early experiences, current challenges and opportunities among the Nile Basin riparian states

Debay Tadesse
Senior Researcher, Institute for Security Studies, Addis Ababa, Ethiopia

INTRODUCTION

In 2002, the United Nations Environmental Programme (UNEP) identified the many challenges facing Africa. Increasing numbers of African countries face water stress scarcity and land degradation. The rising costs of water treatment, food imports, medical treatment, and soil conservation methods are not only having a negative impact on Africa's peoples, but are also draining African countries of their economic resources. While these are facts, one has to realise that Africa is not the driest continent in the world. In fact, it has a reticulation of 54 drainage basins, including rivers, which traverse territorial boundaries or form part of such boundaries. These basins alone cover approximately half the total area of Africa and yet only about 2 per cent of the total water in Africa is utilised.[1]

The Nile is the longest river in the world (6 825 km, about 4 266 miles) in terms of both drainage area and the quantity of water it carries in its watercourse (more than 80 per cent of the Nile water originates in Ethiopia). The Nile has more riparian states (Burundi, Egypt, Ethiopia, Eritrea, Kenya, Republic of Congo, Rwanda, Sudan, Tanzania, and Uganda) than any international river basin in the world. While other countries may have alternative energy sources, a significant percentage of the peoples of the Nile riparian states depend directly on the river for their livelihood and as a source of energy for industrial and domestic needs.

The countries surrounding the Nile have an estimated population of 300 million, which accounts about 40 per cent of the African population, with an average per capita income of US$282. By 2025 the number of people who depend on the Nile River will probably increase to 859 million. The population of Egypt (70 million) is the second highest in Africa and is 10 per cent higher than Ethiopia. However, by 2025, it is projected that Ethiopia will have 20 per cent more people than Egypt.[2]

In addition to population growth, migration, and over-grazing, which have contributed to deforestation and land degradation, the Nile Basin is now experiencing serious environmental pollution as well as drought and desertification. This is especially true of Ethiopia.

Water and food security are closely related. Reliable access to water increases agricultural yields; lack of it can be a major cause of droughts, famine and undernourishment. Under these harsh conditions, the competition for scarce water resources is intense, especially when the resources are less developed and are shared by other countries. One reason for environmental degradation, recurrent drought and famine in this region is lack of water management. Therefore, an important strategic plan for overcoming the problem of recurrent drought and famine is for the upper riparian states to concentrate on water development of the Nile. In this context, it is essential for the governments not only to develop water resources, but also to protect their country's environment and natural resources by cooperating with other concerned countries in order to ensure the environmental basis of sustainable development in the region.

Water scarcity has attracted the attention not only of the Nile Basin states, but also of the international community and is considered one of the major issues of the 21st century. On 22 March 2001, the UN commemorated World Day for Water, at which speakers concluded that demands for freshwater exceeded supplies by 17 per cent, and that over the next 25 years, two thirds of the world's population will experience sever water shortages. In addition, the World Resources Institute in Washington DC has warned that the world's freshwater systems are

in peril. It predicts that by 2025 about a billion people or nearly 50 per cent of the world's population will face scarcity. Allocations of water resources to meet basic human needs, including social and economic development, while maintaining the integrity of aquatic ecosystems, should be the priority of the Nile Basin riparian states.

It is not so much the amount of fresh water available on the surface of the East African region that makes it scarce and a source of conflict, but uneven distribution and utilisation among the riparian countries. There is plenty of water in this region: 'the problem is that in many cases it is either in the wrong place or it is available at the wrong time.'[3] In other words, some regions in the Nile Basin suffer from severe drought, while others are heavily flooded.

Fresh water is abundant: For each human inhabitant there is now an annual renewable supply of 8 300 m^3, which is enough to sustain a moderate standard of living.[4] If the Nile riparian states are to improve and expand their agricultural production, this effort must involve a coordinated management of river flows and transfer of water for irrigation, hydropower development in the context of cooperation and equal utilisation of the Nile water. History has proven that a transboundary river or body of water is more difficult to manage than one that falls entirely or predominantly within the frontiers of a single country.

THE NILE BASIN DISEQUILIBRIUM

To date, there is no comprehensive agreement on the use of the Nile water that binds all the riparian states, and no significant integrated planning has been carried out to develop the basin. The few agreements between some of the riparian countries aim to secure the interest of one riparian state (Egypt, and to some extent Sudan) almost to the total exclusion of other riparian states, especially Ethiopia. This suggests that the governments of the Nile riparian countries need to relate their development policy to efficient water management and utilisation as well as fair distribution of the Nile's water resources.

As a result of poor water resource management, which has led to environmental degradation, Egypt, Sudan, and Ethiopia are entering a period of increasing water scarcity.

This paper argues that unless a basin-wide development planning is considered a viable solution to conflict resolution and poverty reduction, such increasing water scarcity is likely to generate more regional conflicts. In addition, the need to shift away from reliance on emergency food aid to long-term environmentally and socially sustainable development – including irrigation and watershed management – is imperative.

The study provides alternative models of multilateral water development policy within the Nile's riparian states. The paper concludes with an outline for policy reforms at national and regional level that enhance effective cooperation and coordination among the Nile riparian countries. Cooperation among these countries is badly needed if the Nile Basin's environment is to be conserved and food security and sustainable development are to be ensured.

The Nile River is unique in that it has been a greater source of conflict among the riparian countries than most other international river basins. Until recently, the Nile River and its riparian countries did not attract the attention of the international community, with the exception of Egypt and Sudan to some extent. This curious feature of the Nile has become an obstacle to effective cooperation, such as development of joint projects and investments. As a result of this inadequate regional cooperation, and lack of integration, joint projects and investment, the Nile Basin has not made any significant contribution to the welfare of its close to 300 million inhabitants who are among the most impoverished and comprise five of the world's ten least developed countries.[5]

The Nile is also one of the few river basins that show great disparity among the riparian countries between those that contribute almost all the waters but use almost none and those who contribute nothing but use most of its waters. It is almost impossible to discuss the disparity and unequal utilisation of the Nile water without reviewing the history of the Nile Basin riparian countries. The complex physical, political, and human interactions within the Nile riparian states can make the management of the Nile water systems difficult.

Given Egypt's 98 per cent reliance on the Nile for irrigation water and fast population growth, securing the Nile's waters is literally a matter of life and death. In fact, Egypt and Sudan insisted that Ethiopia should not undertake any water development without their consent, even though 86 per cent of the Nile waters reaching Sudan and Egypt originate in Ethiopia, and Egypt and Sudan do not contribute any water to the Nile River. Yet, most of the Nile water is used in Egypt and the Sudan. Irrigated agriculture is the largest draw on the waters of the Nile in these two countries.[6] Comparatively, water is one of the least-developed natural resources in the upper riparian states.[7]

Consequently, Egypt and the Sudan signed an agreement on the 'full utilisation of the Nile water' in 1959. In the agreement, Sudan, as a junior partner, was allotted 18,5 billion m^3 of water, while Egypt retained 55,5 billion m^3.[8] The Sudan was also allowed to undertake a series of Nile development projects, such as the Rosieres Dam. On the other hand, Egypt was allowed to build the High

Aswan Dam near the Sudanese border, which regulated the flow of the river into Egypt and provided water during droughts as well as harnessing the hydroelectric power of the river.

The East African countries at the source of the world's longest river have complained for years about the treaty. Ethiopia reputedly rejected the 1959 agreement between Egypt and Sudan. In 2004, Tanzania unilaterally announced the establishment of a 170-kilometre water pipeline from Lake Victoria (where 14 per cent of the Nile originates) to supply water to some dry areas in the country. According to the *Cairo Times*, the project was said to be a direct violation of the 1929 treaty that has so far governed the use of the Nile water by the basin countries. Only months earlier Kenya, another riparian state on the Nile Basin, said that it would 'not accept any restrictions on the use of Lake Victoria and River Nile', and that it would unilaterally withdraw from the 1929 treaty. Kenya, Tanzania, and Uganda, on Lake Victoria, have long claimed that the treaty is a relic of colonial times because foreign rulers negotiated it without referring to their countries' best interests.[9]

Tension among the Nile Basin countries arises whenever a new Nile project is proposed. The water needs of the upper Nile Basin riparian countries are barely being met. In addition, Egypt believes that it is the most in danger of losing access to the Nile waters by development projects in other countries and remains willing and able to intervene militarily to maintain the status quo.[10] The biggest fear is that Ethiopia will develop its water resources.

Confrontation has characterised the Nile for hundreds of years. The result has been insecurity and fear over the utilisation of the Nile waters. Cooperation has been prevented by some of the riparian states. Now, it will be clear to all the riparian states that the only viable alternative is cooperation, a non-zero sum game, where the result is a win-win solution.

EGYPT'S WATER RESOURCE POLICY

So far, Egypt has based its Nile-related policy on an international water law principle known as the law of prior appropriation. The concepts of 'historical rights,' 'acquired rights,' and 'established rights' are derivatives and extensions of the law of prior appropriation.[11] Egypt first based its claim of Nile waters on the concept of acquired rights in 1929, during negotiations for the Nile water agreement with Anglo-Egyptian Sudan. Since then, Egypt has consistently relied on the principles of acquired rights. The concept of acquired rights, as the basis of Egypt's policy, excludes any share or entitlement other riparian countries might have.

SUDAN'S WATER RESOURCE POLICY

After Egypt, Sudan makes the heaviest use of the Nile River. Currently, Sudan claims that it is using about 16,12 billion m^3 of Nile River waters and irrigates 2,95 million acres of net cultivable agricultural land annually. In both the 1929 and 1959 Nile Waters Agreements, Sudan accepted the concept of acquired rights, which it still regards as important in maintaining the share of Nile waters allocated to it by the 1959 agreement.[12] However, Sudan currently acknowledges that this concept is not the sole basis for international agreement, but should be considered together with the legal principle of 'equitable and reasonable use'. Sudan's policy regarding Nile water use by other riparian countries seems to be guided by the dual principles of acquired and equitable and reasonable use of shared water resources. At times Sudan's leaders have played the 'Nile water card' to intimidate Egypt. Sudan's policy on the issue of water use by other riparian countries is generally more cautious and accommodating.

ETHIOPIA'S WATER RESOURCE POLICY

As a major riparian state, with its tributaries contributing 86 per cent of the Nile water, Ethiopia generally preferred to stay in the background in Nile-related regional undertakings, but recent developments show Ethiopia's readiness to play a proactive role in the coming years. Compared with Egypt's and Sudan's Nile water use, Ethiopia's current level of consumption is negligible.

Unlike Egypt and Sudan, Ethiopia does not advocate the principle of acquired rights; instead, it consistently promotes the concept of equitable entitlement as the best way to settle Nile water-allocation issues. This concept has been the dominant feature of Ethiopia's policy in the last four decades, even though there were times when it took a more monopolistic approach.

UGANDA, TANZANIA, AND KENYA

The East and Central African Nile Basin countries of Uganda, Kenya, Tanzania, Republic of Congo, Burundi and Rwanda were unable to exploit the Nile waters for consumptive use during the colonial era.

The treaties that were concluded on their behalf by the colonial power in 1929 and later the 1959 agreement between Egypt and Sudan had their hands tied. Until the late 1950s and early 1960s, all of the upper White Nile River riparian countries were under British or Belgian rule.

After the East African states gained their independence, almost all of them repudiated treaties concluded

on their behalf by the colonial powers (including those that dealt with the Nile waters). Despite such statements, Uganda still abides by some of the colonial-era agreements, such as the Owen Falls Agreement, under which Egyptian technicians continue to control the flow of the White Nile at the Owen Falls Dam.

CONFLICT AND COOPERATION

The upper riparian countries are embroiled in endless conflicts and instability and have been unable to give full attention to the development of their water resources. Examples include the recently ended civil war in the Sudan, ethnic conflicts in Rwanda, Burundi and the Republic of Congo, and the consequent tremendous loss of life, resources which have worsened the socio-economic conditions in these countries.

In the absence of a serious challenge, Egypt, in particular, carried out a series of major water projects that not only appropriated large portions of the Nile waters, but also brought the flow within its sovereign jurisdiction. It deployed all human, material, and scientific resources to put in place the legal and institutional framework that could enable it to acquire a monopoly over the Nile River.

Yet, according to Girma Amare, Egypt has assumed the role of a gate-keeper to raise objections whenever any of the riparian states carry out projects and use their water resources.[13] Ironically, this is not the usual outcome of transboundary rivers shared by two or more countries. In fact, Egypt presents a claim of 'absolute territorial sovereignty', typically claiming the right to do whatever it chooses with the water, regardless of its effect on other riparian states. Downstream states, on the other hand, generally begin with a claim to the 'absolute integrity of the river' or other surface water source, claiming that upper riparian states can do nothing that affects the quantity or quality of water available to the lower states.[14] The challenge is to develop or create a relationship based on the universally accepted principle of 'equitable utilisation of water'[15] where it has been damaged or destroyed in the past. This is a task that the Nile Basin riparian countries have to tackle.

WATER AND FOOD SECURITY

Unpredictable rainfall as a result of climate change, lack of water management and drought, and failure of crops is making food security impossible in this region. Water and food security are closely related. Reliable access to water increases agricultural yields; lack of it can be a major cause of droughts, famine and undernourishment. Food security means not only availability, but also stability and access to food.

Agriculture accounts for half of gross domestic product (GDP) of the Nile upper riparian states, more than 80 per cent of their exports, and over 70 per cent of their total employment.

A combination of frequent drought, poor cultivation practices, and low levels of on-farm investment persistently undermine the productivity of the agriculture sector in this region. Since agriculture is the main activity of many rural communities, the availability of adequate water allows production of food for household consumption and for sale at local markets.

In addition, the availability of irrigation water enables more crops to be grown per year and increases year-round farming and employment opportunities. Without an efficient energy supply and proper management to regulate the irrigation schemes, irrigation will be problematic. Until recently, the development of irrigation schemes in the upper riparian states has been minimal. To date, only 5 per cent of the total potential is utilised. In spite of its importance, agriculture in the upper riparian states is based on subsistence farming, whose modes of life and operation have remained unchanged for centuries.

The Nile riparian states need to use water more efficiently as an input to agricultural production. More efficient use of water from traditional water harvesting and moisture control practices to modern irrigation systems, combined with the use of improved technology, will contribute significantly to food security in this region. Relying on rain-fed agriculture to feed a nation of over 300 million people is not possible, considering the current climate-change phenomenon. For example, the present government of Ethiopia has lost 12 years without eradicating starvation, even though it allocated a huge amount of budget and manpower in the so-called Extension Programme. The Extension Programme failed solely because the farmers relied on rain-fed agriculture.[16] Weather is the most difficult phenomenon to predict and control. Hoping to feed about 100 million Ethiopians by 2015 by relying solely on rain-fed agriculture is madness. Satisfying adequately the demand of water that is required to forge a productive farmer is the most decisive and difficult point for these region to fulfil.[17]

Interestingly, currently all the Nile riparian states have drawn up ambitious national water development plans. The problem is that these are often carried out on unilateral and non-consultative bases, which imminently create further competition for fresh water. In view of the absence of legal and institutional mechanisms at regional level, a continued unilateralist approach to water development is expected, at least in the short run.

However, it is beyond dispute that such a unilateral approach is conflict laden and incompatible with a more cooperative approach.

In this context, it is essential for the authorities not only to develop water resources, but also to protect the region's environment and natural resources by cooperating efforts to insure the environmental basis of sustainable development in the region.

WATER AND ENERGY

Today's energy picture in the upper Nile Basin riparian countries would probably surprise most us. For more than 85 per cent of 300 million or so people in the Nile Basin riparian countries, energy is about wood, waste, dung, candles and kerosene. The energy picture in the Nile Basin riparian states is also marked by environmental degradation from poor management of traditional fuels. Fuel supply in this region is mainly biomass based. If these countries continue to rely on biomass energy resources, what will be the serious effects on the environment, through deforestation and soil erosion.

Utilising energy efficiently is crucial in order to provide adequate water for agriculture and livestock development and for human consumption. Small hydro schemes could provide considerable help to these countries and further development of small hydro plants is crucial to meeting the needs of the scattered rural population. Therefore, a transition to sustainable energy systems is needed to accelerate the growth of basic food production, harvesting and processing. However, breaking the current energy bottleneck must be environmentally sustainable, socially acceptable and economically viable. Such a transition involves a commitment to long-term development goals and requires innovative policy and technological solutions.

In the upper riparian states, an energy transition would be characterised by a move from the present levels of subsistence energy usage to a situation where household, services, and farming activities use a range of sustainable and diversified energy sources. Reducing fuel-wood consumption through the use of efficient energy and technology and increasing fuel-wood production by planting the right type of multi-purpose trees contributes to reducing the rate of deforestation. This would, at the same time, produce animal feed, control erosion, improve the quality of the soil, and generally halt land degradation and secure long-term productivity. Promoting food security by raising agricultural productivity and sustainable production systems will inevitably involve increases in energy inputs to provide community lighting and drinking water.

Future water demand for farming, including livestock production, will be influenced by strategies for food security. Water shortages are also becoming a serious impediment to intensifying agriculture and bringing new lands into production. Currently, about one third of the people in the region live in drought-prone areas. In these areas, drought-proofing measures such as soil and water conservation, improved water harvesting techniques, minimum tillage, improved crop selection and varieties, and small-scale irrigation will be important elements in Ethiopia's food security strategies.

Food security means not only availability but also stability and access to food. With a focus on rain-fed production, it will be necessary to address the well-known problems in the Nile riparian states of low productivity, high variability from inadequate water control, and scarcity of off-farm employment and uncertain incomes. While irrigation stands out as a major factor for improving agricultural productivity, it can provide a base for growth, income, and employment in marginal rural areas, thereby mitigating one cause of urban migration.

Promoting food security by raising agricultural productivity and sustainable production systems will inevitably involve increases in energy inputs, plant nutrients, agro-processing and will provide community lighting and drinking water. Small pumps have had an important beneficial effect on irrigation in some African countries of vegetable and even rice production. In Ethiopia, a transition to sustainable energy systems is needed to accelerate the growth of basic food production, harvesting and processing. The benefits are greater resilience in the production system, higher productivity, improved efficiency, and higher incomes to farmers. Environmental degradation, driven primarily by poverty, would be minimised.

RECENT DEVELOPMENT

On 22 May 2009 ministers of water from the Nile Basin Initiative (NBI) member states met in Kinshasa, DRC. The purpose of the meeting was to forge a way forward towards finalising the outstanding issues (Article 14b, Water Security) of the draft Cooperative Framework Agreement of the NBI. The package proposed in Kinshasa has 39 articles and 66 sub-articles. At that meeting, agreements were reached on all articles, except on that related to specifically water sharing (Article 14B).

Following this meeting, the 17th annual meeting of the Nile Council of ministers in charge of water affairs was held on 27–28 July 2009 in Alexandria, Egypt.

Ministers from Burundi, DRC, Egypt, Ethiopia, Kenya, Rwanda, Sudan, Tanzania and Uganda as well as Eritrea attended the meeting and held discussions on key strategic issues. At the two-day meeting in Cairo, despite further discussion on Article 14B, compromise could not be reached. All other participating countries had wanted to approve the contentious agreement at the Egypt conference. However, Sudan and Egypt pushed for a six-month extension. The water resources minister of Ethiopia said

he was dismayed at the continued refusal of Sudan and Egypt to sign the water sharing agreement (above). He added that the ongoing dispute was holding Ethiopia back from harnessing the economic potential of the Nile River.

THE NEED FOR COOPERATION

If there is cooperation, Ethiopia can help to stop the silting, which is causing considerable problems in Egypt and Sudan's dams by rehabilitating the natural environment of the Upper Nile Basin. The construction of a series of dams in the Ethiopian highlands would not only provide more irrigation for farmers in those areas, but also boost upstream water storage, and reduce the annual Nile floods, which would benefit both Sudan and Egypt, since decreasing the evaporation would increase the total volume of available water. According to some experts, the amount of water available to the downstream riparian states would not be affected.

Egypt and Sudan would still benefit from the construction of the reservoir in the upper riparian states. According to Allan, after taking into account the evaporation and seepage at Lake Nasser, the Ethiopian storage facilities could increase water availability for Egypt as much as 15 billion m^3 per year.

In addition, according to the Ethiopian government, 'the water that can be saved by building dams in Ethiopia and the water that is inappropriately wasted in Egypt and Sudan through evaporation could together be enough to satisfy Ethiopia's irrigation needs' and this conversion of water wastage through evaporation can be made to use if cooperation is given a chance.

RECOMMENDATIONS AND CONCLUSIONS

Among the major political factors that have impeded multilateral cooperation in the Nile Basin are colonial legacies of unresolved bilateral agreement. To date, most interstate cooperation in the Nile Basin has been bilateral, and mostly project by project. The findings of this study suggest that Egypt relies on the Nile for 98 per cent of its irrigation water. Its population of 70 million already use considerably more than its quota, and securing the Nile's waters for Egyptians is literally a matter of life and death. Therefore, the first logical step to take is to openly discuss the issue of the Nile with the desire to find a win-win solution. In this effort, scholars and experts will provide many insightful clues as to how the issues of equity and efficient utilisation of water should be addressed. Some of the general views mentioned in this paper, including the Helsinki Rules, as ways of equitable utilisation of the Nile water would certainly prove useful by making more water available to those countries that have been excluded from utilising water resources for satisfying basic human needs such as food.

Additionally, the Abay (Blue Nile) River Basin has considerable irrigable land. In the face of drought-induced famines that constantly afflict the upper riparian states, these countries must utilise the waters of the Blue Nile for hydropower and irrigation.

To ensure rapid development, the Nile riparian states need to appropriately utilise and simultaneously conserve their natural resources.

Public statements notwithstanding, donors sometimes shy away from organisations or governments that insist on maintaining their own values and methods. Some scholars argue that donors give aid primarily to help their political, economic, and strategic self-interests. There is no historical evidence to suggest that donors give aid without expecting benefits. There are two broad motivations that are often interrelated: political and economic. Moreover, a serious assessment of the impact of foreign aid on the recipient countries has shown conflicting paradigms. Aid has not been effective in promoting economic development. It has enhanced urban-biased policies by encouraging rapid growth in urban populations and by increasing the disparity in purchasing power between urban and rural areas. Aid has favoured urban over rural populations and public over private enterprises. Aid money is spent in the capital, rather than in the countryside, and experts and training are located in the capital rather than in the villages.

Sooner or later all the Nile Basin riparian states are bound to assert and engage in the utilisation of their water rights of the Nile, employing standards that they deem legitimate and appropriate. Both the 1929 and the 1959 agreements were only bilateral and did not include any of the other riparian countries of the Nile, although they portioned out all of the Nile's water. All of Nile's average water flow is divided between the two countries that are furthest downstream. This has not been accepted by the rest of the riparian countries and it suggests that conflict over water resources will intensify.

The existing model is based on the status quo in the early and mid 20th century and is deeply flawed. Currently there is no alternative model of cooperation except the current NBI, which all parties and donors recognise as transitional. The NBI should be given time to operate until the participating member states are able to evaluate it and, in the light of experience, decide on the next steps.

To balance the needs of a sprawling civilisation with a vulnerable water supply, we ought to carefully examine every potential solution. The potential for acute interstate conflict over the Nile water arises primarily because there is not a comprehensive agreement between stakeholders. A framework that binds strong riparian cooperation and coordination through transboundary

activities – including capacity building, training, education, awareness raising, knowledge and information sharing, communications and environmental monitoring – is needed to avoid conflict over scarce water.

NOTES

1 C O Okidi, *Environmental stress and conflicts in Africa: Case studies of drainage basins,* Nairobi: African Centre for Technology Studies Press, 1994, 1.

2 Derege Desta, The study of development on the Nile River is on progress, *Reporter,* April 1992, 12.

3 Tvedt Terje, The management of water and irrigation: The Blue Nile, in M Doornbos, L Cliffe and Ahmed Abdel Ghaffar M (eds), *Beyond conflict in the Horn: Prospects for peace, recovery and development in Ethiopia, Eritrea, Somalia and Sudan*, London: James Currey, 1992, 27.

4 Sandra Postel, Water: Rethinking management in an age of scarcity, *Worldwatch,* December 1984, 7; An annual supply of 1 000 m^3 per person is typically given as necessary for a decent standard of living.

5 John Waterbury, *Hydropolitics of the Nile Valley,* New York: Syracuse University Press, 1979, 43.

6 Alan Moorehead, *The White Nile,* London: Hamish Hamilton, 1960, 93.

7 Zewdie Abate, *Water resources development in Ethiopia: An evaluation of present experience and future planning concepts,* Lebanon: Ithaca, 1994, 11.

8 In 1925, a new water commission made recommendations based on the 1920 estimates which led finally to the Nile Waters Agreement between Egypt and Sudan on 7 May 1929. Four bcm/yr was allocated to Sudan, but the entire timely flow (from January 20 to July 15) and a total annual amount of 48 bcm/yr was reserved for Egypt. Egypt, as the downstream state, had its interests guaranteed by:

- Having a claim to the entire timely flow. This meant that any cotton cultivated in Sudan had to be grown in the winter months
- Having rights to on-site inspectors at the Sennar Dam, outside Egyptian territory
- Being guaranteed that no works would be developed along the river or on any of its territory if they threatened Egyptian interests

9 *Extra,* published by Ze Ethiopia, Egypt fears other African nations' use of Nile water, March 2004.

10 *Extra*, Ethiopians are willing for any deal as long as our right is protected, *Efoyta,* July 1989, 5 (Ethiopian Calendar).

11 Waterbury, *Hydropolitics of the Nile Valley.*

12 Country Report of Sudan 1993.

13 Girma Amara, The Nile issue: The imperative need for negotiation on the utilization of the Nile Water, Occasional Paper, Series 6, The Ethiopian International Institute for Peace and Development (EILPD), volume 2 (July 1997), 13.

14 Joseph W Dellapenna, Treaties as instruments for managing internationally shared water resources: Restricted sovereignty vs community of property, *Journal of International Law* 26 (1) (Winter 94), 27.

15 The earliest attempt was made by the International Law Association (ILA), an NGO. At its 52nd conference in Helsinki in August 1966, the ILA adopted rules that set the guiding principles on the uses of international watercourses. Although the Helsinki Rules do not have a binding effect, they have contributed to a significant extent to subsequent codification efforts, particularly by the International Law Commission. The basic principle laid down in the Helsinki Rules on transboundary waters was that they have to be shared equitably and reasonably among the riparian countries. To determine an 'equitable and reasonable sharing', certain factors, though not exhaustive, were listed in the same set of rules. The Helsinki Rules, as they were first adopted by the ILA in 1966, explicitly recognised the principle of 'equitable utilisation'.

16 Tadesse H Selassie, Engineers proposal on how to eradicate hunger and reduce poverty in Ethiopia, Berta Construction, Addis Ababa, Ethiopia, 2003, 12.

17 Ibid.

Sustainable transboundary basin development as a strategy for climate change-induced conflict prevention

Reflections from Eastern Nile[1]

Ahmed Khalid Eldaw[2] and Wubalem Fekade[3]
Eastern Nile Technical Regional Office

INTRODUCTION

Climate change is no longer a disputed phenomenon. There is overwhelming scientific evidence and consensus that climate change is an ongoing, observable process (that is, warming of the earth's atmosphere owing mainly to the accumulation of greenhouse gases). Climate change, unless addressed proactively, is likely to induce, at various spatial levels, a cascade of natural[4] and socio-political[5] stresses and a constellation of related conflicts.

Though climate change is a certainty, as regards the Nile basin there is uncertainty about the direction and the magnitude of its impact on precipitation and run-off, and other related parameters. All the same, whichever the direction of the impact (that is, whether there will be more or less precipitation and run-off or more floods and droughts), climate change will increase the vulnerability of the ten riparian countries of the Nile. According to the Intergovernmental Panel on Climate Change (IPCC),[7] vulnerabilities of regions to climate change are largest 'in semi-arid and arid low-income countries, where precipitation and stream flow are concentrated over a few months, and where year-to-year variations are high', a condition that best describes a good part of the Nile basin, where population concentration is highest. Climate change will aggravate the growing demand on the Nile resources, driven by high rates of population increase, economic growth, increasing urbanisation, industrialisation, and the attendant growth in demand for water and energy, The consequences of climate change will be multifaceted for the ten riparian countries of the Nile, directly impacting their security policies, whether security is expressed in terms of geo-hydropolitics or simply in terms of human security, water security, energy security, food security, environmental security, etc. How these security concerns are handled and managed will determine whether the Nile Basin will be a region of sustainable transboundary development and peace or of instability and conflict.

Given that the Nile is a source of sustenance for the ten countries, adaptation to and mitigation of the impact of climate change cannot be effective if done unilaterally, by one country alone. The assumption is that climate change, by virtue of its being an equal opportunity for all, is expected to inspire and draw all Nile riparian countries to cooperate. Among a number of regional organisations, NBI, drawing from its transboundary mandate, is better positioned to play a critical role in promoting regional – that is, cooperative, inter-riparian adaptation and mitigation – policies, programmes and strategies.

In the next sections, NBI and its programmes are introduced briefly. On the whole, it is argued that NBI's current programmes and activities, though perhaps not initially designed for the sole or primary purpose of adaptation to climate change, will nevertheless be equally effective.

THE NILE BASIN INITIATIVE

Established in February 1999, the Nile Basin Initiative (NBI)[8] is a transboundary institution of the ten riparian countries. As expressed in their Shared Vision Statement, the NBI member countries are committed to ensuring 'sustainable socioeconomic development through the equitable utilization of, and benefit from, the common Nile Basin water resources'. Sustaining the common Nile Basin water resources – that is, ensuring their continued availability in adequate quantity and quality to meet the needs of current and future generations – in the midst of ongoing climate change is the immense task the Nile Basin countries have set for themselves.

To realise this vision statement, NBI, which is headquartered in Entebbe, Uganda, established various institutions and programmes. NBI is a transitional arrangement established to support the cooperation process until the ongoing negotiations over a cooperative framework agreement (CFA) are concluded. These negotiations are expected to lead to a permanent legal foundation, which will enable the establishment of the Nile River Basin Organisation, responsible for the productive development and sustainable management of shared Nile resources.

Concurrently, the NBI also established two parallel programmes. The first, the Shared Vision Programme (SVP), consisting of eight projects, works toward creating, enabling and facilitating conditions for basin-wide cooperation through the joint generation of thematic data and facilitative studies, including studies on benefit sharing, environment management; power trade; capacity and confidence building; stakeholder involvement and communication in a transboundary context. The second consists of a set of two subsidiary action programmes (SAPs): ENSAP in Eastern Nile comprises Egypt, Ethiopia and Sudan; and NELSAP in the Equatorial Lakes region comprises Burundi, DRC, Rwanda, Kenya, Tanzania, Uganda. These programmes concentrate on preparing regional, cooperative projects for implementation on the ground to demonstrate early benefits of cooperation.

This paper focuses and is based on experiences at ENSAP/ENTRO. ENSAP is working towards:

- Ensuring efficient water management and optimal use of the Nile water resources through equitable utilisation
- Ensuring cooperation and joint action among Eastern Nile countries seeking win-win goals
- Targeting poverty eradication and promoting economic integration
- Ensuring that the programme results in a move from planning to action

ENSAP is managed by Eastern Nile Technical Regional Office (ENTRO), headquartered in Addis Ababa, Ethiopia. ENSAP operates on the basis of a clearly articulated mission statement: 'Working towards benefits of cooperation'. ENTRO has formulated its own strategic plan, and is anchored in a set of values that, among others, put regional orientation at the forefront. This is encapsulated in ENTRO's value statement:

- **R**egional orientation, focus on people and environment;
- **I**nitiative, dynamism, creativity;
- **G**ender balance, equity, respect for diversity;
- **H**onesty, excellence, professionalism;
- **T**eamwork, participation, partnership.

The governance structure of ENSAP/ENTRO consists of the Eastern Nile Council of Ministers (ENCOM), the highest policy and decision-making body; and the Eastern Nile Subsidiary Action Team (ENSAPT), which is the board that directly supervises ENSAP/ENTRO and acts as advisory committee to ENCOM.

EASTERN NILE WATER RESOURCE KNOWLEDGE GENERATION

The need to establish and build a Nile Basin-wide water resource-related knowledge base (data, information, analytic tools, etc) and information on transboundary communication and consultation mechanisms is being increasingly felt. At ENSAP there is an evolving yet discernable pattern of cooperative generation of shared Eastern Nile water resource information, data and knowledge and institutionalisation of consultation mechanisms. Such processes will make a significant contribution to regional confidence building and knowledge-based decision making, a critical requirement for effective adaptation to and mitigation of climate change impacts threatening the Eastern Nile.

Among the many challenges ENSAP/ENTRO has to grapple with is the need to generate pertinent baseline and operational data, information and knowledge of the hydrological, hydraulic, environmental, socio-economic, institutional dimensions of the Eastern Nile sub-basin, which is becoming more pressing because of the potential threat climate change poses to the region. In addition, ENSAP has concurrently to introduce and instil a new perspective, a new vantage point from which to appraise the present and future state of Eastern Nile. This perspective can be based only on the concept of 'one river system, multiple countries', if the goal is an efficient and effective adaptation and mitigation strategy. The reason is clear: the Nile, which crosses over ten countries, behaves as an integrated hydrologic unit. It 'senses' and responds to any action anywhere in its 3 million km^2 area and on its 7 000 km journey as one unit, despite national borders. Such orientation is critical for Eastern Nile policy makers to make milestone decisions not only to foster regional cooperation, but also to effectively respond to the threat of climate change.

At the same time, the emergence of an Eastern Nile regional, basin-wide orientation and outlook among policy makers, water resource planners, engineers and technocrats – whose thinking and experience has been focused on sovereign territory for so long – requires significant effort for internalisation. Despite these challenges, it is

increasingly accepted that without basin-wide orientation it will be impossible to adapt to or mitigate the impact of climate change. Further, a basin-wide perspective and approach is essential if the goal is to move away from the current bias toward nationally focused, competitive, unilateral utilisation, which, in conjunction with population growth, continuous and growing water demand, and exacerbated by climate change, could threaten the existence of the Nile unless it is checked.

With these in mind it becomes evident why there is so much emphasis on the current ENSAP effort to establish an expanded water resource knowledge base – for example commonly agreed upon, jointly developed, shared technical and analytical tools and frameworks; cooperative regional assessments; decision support systems, planning models – and associated information flow mechanisms – for example communication strategies and knowledge management and data sharing.[9] [10] These are deemed key variables and links for promoting basin-wide strategic orientation, critical for the creation of enabling environment to adapt to/mitigate impacts of climate change.

At ENTRO the evolving inter-riparian expert consultative good practice adopted in single-sector studies and small-scale fast-track projects has smoothly fed the decision-making processes at various levels. This has contributed to the gradual emergence of a basin-wide 'one river system, multiple countries' perspective, facilitating the move toward more complex, integrated joint multi-sector and large-scale investment programmes. In addition, this attitude has empowered riparian experts to adopt a 'no-borders perspective' in their approaches and analyses, and has yielded confidence to move faster on decisions.

EASTERN NILE CONSULTATION AND COMMUNICATION MECHANISMS

The organisation and institutional set-up of ENSAP has in-built structures and provisions for regular consultation at multiple levels (for example ministerial, technical and regional working group, wider public and civil society). NBI provided the first-ever opportunity for water resource and related technical experts and professionals (variously organised under regional working groups, steering committees, subsidiary action programme teams) of all riparian countries (or sub-regionally in SAPs) to work together to craft common Nile water-resource management and development approaches, strategies and policies and make project-related decisions. This process – a joint deliberation, consensus-based decision-making exercise of technical experts – sets an enabling condition to deepen Eastern Nile cooperation to respond to climate change.

ENTRO is essentially an inter-governmental institution. However, issues related to transboundary water resources in general, and more so to adaptation to the impact of climate change, cannot be the sole responsibility and prerogative of governments. There are diverse stakeholders in this, ranging from international, through regional, to community level. In a way, the principle of subsidiarity that informs the organisational and decision-making arrangements of the NBI provides space for non-governmental organisations, especially local stakeholders. It was recognition of this and of the need to lay a strong non-governmental foundation for NBI that led to the establishment of the Confidence Building and Stakeholder Involvement Project (CBSI), which seconded expert staff to ENSAP and NELSAP, and laid the ground for the formation and consolidation of the Social Development and Communication Unit at ENTRO.

A broad sector of Eastern Nile stakeholders has been identified and working relationships are being established to mobilise support, to disseminate information, to create awareness, to solicit input and feedback and to build coalitions. These stakeholders include groups from the media, academia, women's organisations, lawyers, parliamentarians, labour, and youth, which reflect diverse sets of interests and stakes in the resources of the Nile. Regular consultation with and engagement of such stakeholders is good development practice that results in improved programme and project design, and fosters stakeholder ownership of the processes and consequences of ENSAP-led interventions in the Nile Basin. Some of the NBI-linked civil society organisations are Nile Basin-wide in their scope, such as the Nile Media Network and the Nile Basin Dialogue Forum (NBDF). The first brings together media professionals from the Nile Basin and the latter members of civil society such as the professions (academics, lawyers, environmentalists, artists). These consultation and communication platforms provide opportunities for cultivating upstream-downstream hydro-solidarity, confidence building, and networking for knowledge dissemination, awareness creation and community mobilisation. Such developments, in essence, are facilitating preconditions for conflict prevention and peace building in the region.

EASTERN NILE COOPERATIVE WATER-RESOURCE DEVELOPMENT PROJECTS

ENSAP, as a sub-regional programme of the NBI, promotes cooperation among Egypt, Ethiopia and Sudan, primarily through the collaborative, joint preparation of investment-ready projects that confer win-win outcomes. ENSAP projects directly or indirectly contribute to the joint management of climate change-induced risks – such

as floods and droughts, and wetland and watershed degradation. Equally important, if not more important, is the process through which such projects are identified and prepared. For one, the projects are identified and prepared under the supervision of regional coordinators recruited from all three countries. Second, the projects are scrutinised by technical working groups composed of technical experts from the three countries and finally the projects are agreed by the respective countries. All such decisions are made through consensus, that is, with full agreement of each member country. Irrespective of whether the projects will eventually be implemented nationally or regionally, ENSAP projects are identified and prepared jointly, taking into account their impact on the entire Eastern Nile and each member country. The envisaged first project of the Eastern Nile Joint Multipurpose Programme (JMP) alone will cost billions of dollars. The JMP is a cooperative Eastern Nile development programme and is envisioned to include several components (such as watershed management in the upper catchments, flood-plain management, irrigation productivity enhancement and development, and water infrastructure such as reservoirs, hydropower generation and joint institutions). JMP is expected to bring about major forward linkages into regional relations and trade and is of a scale that can provide transformational socio-economic benefits in the region. The Eastern Nile Planning Model Project (ENPM) is another project being jointly developed to provide a decision support and modelling framework to identify and evaluate water resource investments in a sub-basin, regional context. The Eastern Nile Watershed Management Project (ENWM) strives to address the root causes of watershed and land degradation in a regional context. The Irrigation and Drainage Project, the Ethiopia-Sudan Transmission Interconnection Project, the Eastern Nile Power Trade Study, the Flood Preparedness and Early Warning are the remaining components of ENSAP projects, otherwise known as Integrated Development of Eastern Nile (IDEN).

Cooperation through joint investment planning is the best, perhaps most viable way of preventing the likelihood of climate change impact-induced conflicts in Eastern Nile. Beyond positive direct economic returns, cooperation through joint investment planning, development and management will bring multiple benefits: a sustainable Nile; sustainable socio-economic development; sustainable regional peace-building and confidence building; conflict prevention, etc.

Addressing climate change as an ENSAP agenda

El tahir defines sustainable water resource as a 'flux of water that is managed with the objective of maintaining the availability and quality of water for as long as the current climate prevails'.[11] Climate change thus is one of the main threats to sustainable development of water resources anywhere, since it redistributes the natural occurrence of the hydrologic phenomena that supply water to different regions. The challenge, therefore, is to preserve the Eastern Nile water resources (including associated ecosystems such as wetlands, forests, aquatic and terrestrial life forms) in their current or improved state. This will ensure another dimension of sustainability: inter-generational sustainability, commonly defined as meeting the needs of the present without compromising the ability of future generations to meet their own needs.

Sustaining the Eastern Nile water resources in the midst of ongoing climate change is one of the urgent and emerging agendas ENTRO has at its forefront. With this in mind, ENTRO commissioned a study and prepared an approach paper on addressing climate change in the management and development of the Eastern Nile Basin. The key recommendations that emerged from the study included adoption of a regional approach, coupled with development of regional prediction capacity; minimisation of irrigation water loss and increasing reservoir capacity; minimising negative anthropogenic factors such as deforestation, and enhancing education and research capacity. The paper recommends a proactive approach that highlights these aspects: enhancing prediction, adaptation, mitigation capabilities; using potential opportunities (such as clean development mechanisms (CDMs)), and promoting education.

In the short term, the paper recommended that ENTRO concentrate on:

- Implementing climate-change-related capacity building in regional climate modelling in coordination with the current ENSAP Flood Protection and Early Warning Project
- Considering climate change impacts in the JMP1 identification studies, for mitigation and adaptation
- Developing and applying the Eastern Nile Irrigation Management Information System (ENIMIS) concept
- Participating in the CDM process
- Sponsoring a regional seminar series on climate change and sustainable development

ENSAP/ENTRO is considering coordinating and synergising its activities with the other NBI centres (Nile-Sec, NELSAP) to initiate integrated, basin-wide climate change adaptation/mitigation responses including policies, programmes and plans for capacity building and related measures,. Toward this end, ENTRO is working out approaches for sourcing such an initiative.

CONVERTING THREATS INTO OPPORTUNITIES

The foregoing sections outlined what NBI/ENSAP is about and highlighted its transitional nature, that is, it will eventually give way to a more permanent arrangement when the Cooperative Framework is concluded. The paper also showed how one of NBI's two Subsidiary Action Programmes, ENSAP, promotes cooperation through investment planning and project preparation. From the perspective of adapting to/mitigating the impacts of climate change, the ongoing ENSAP experience is regarded as providing an example and a viable option. The inevitability of climate change impacts (eg recurring floods or drought; watershed degradation (see figure 2); desertification wetland degradation and bio-habitat extinction) should spur the riparian countries to deepen their commitment and embark on setting up more stable and predictable institutional arrangements. Such developments in turn would enable the crafting of coordinated, sustainable Eastern Nile, that is, regional responses to impacts of climate change, whatever the nature of the impacts.

A CAVEAT BY WAY OF CONCLUSION

The preceding sections outlined processes. ENTRO/ENSAP is a young, growing institution or programme. Hence, the deepening of the cooperation process (and the expansion of cooperative projects, and the emergence of holistic, basin-wide perspective among water-resource policy makers and professionals of the three countries) should not be perceived as a concluded event. It requires continued nurturing and renewed commitment from all stakeholders, including national governments, basin civil society and community groups, development partners. Without continued commitment of such stakeholders, the gains made so far can be reversible, in which case our capacity to adapt to and mitigate the impacts of climate change and prevent conflicts will be severely impaired.

In conclusion, two process variables are deemed critical for adaptation to and mitigation of climate change impacts in Eastern Nile. These are:

- ***Consultative and participatory practices:*** the current, evolving consultative and participatory ENSAP practices and culture need to be deepened and institutionalised. These include those taking place at several levels: regional, sub-regional, national, and sub-national; and ministerial, technical, legislative, regional working group, wider public and civil-society level
- ***Knowledge-based decisions:*** The second feature of decision making at ENSAP is knowledge. ENSAP strives to base its decisions on knowledge and facts, including information about climate change. So far, the creative process of deliberation and knowledge generation and the knowledge products themselves have served twin purposes: building riparian technical capacity; and building confidence and fostering trust in their own capabilities and in ENSAP's long-term viability and growing appreciation of the mutuality one another's needs. These practices need to be entrenched and institutionalised.

NOTES

1 Disclaimer: The opinions expressed here are the authors' only. They do not represent ENSAP/ENTRO or any of the member countries of the NBI.

2 Executive Director, ENTRO.

3 Social Development Officer, ENTRO.

4 For example, soil degradation, erosion and irreversible desertification; increased temperatures and attendant sea level rises, spatial and temporal variation of precipitation – both inter- and intra- seasonal, and changes in biodiversity.

5 For example, changes in patterns, extent and direction of migration; changes in demographic sizes and composition; changes in human settlement patterns; competition over scarce resources; escalation of social, ethnic and identity-based tensions.

6 IPCC, Climate Change 2007: Impacts, Adaptations and Vulnerability: Scientific-Technical Analyses, Contribution of Working Group II to the Second Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge, UK and New York, NY, USA: Cambridge University Press, 2007.

7 NBI member countries are Burundi, Democratic Republic of Congo, Egypt, Ethiopia, Kenya, Rwanda, Sudan, Tanzania and Uganda. Eritrea has observer status.

8 Although not yet codified as protocols, EN member countries regularly exchange information necessary for planning projects and conducting studies.

9 The knowledge base has been developed by jointly identifying key EN water resource-related challenges and potential opportunities for development. These knowledge products include single-sector cooperative regional assessments (CRAs), which are studies that, in a transboundary context, identify potentials and constraints, and assess likely trends of what happens in a resource base, in this case Eastern Nile CRAs include socio-economic, environment and natural resources such as EN Watershed Management (ENWS), EN Power Trade Studies (ENPTS) and EN Irrigation and Drainage Studies. Another set of EN knowledge products includes the results of fast-track project studies, for example Watershed, Flood Protection and Early Warning; Eastern Nile Planning Model; Ethiopia-Sudan Transmission Interconnection; and irrigation and drainage projects.

Assessing regulations of international water utilisation and inequalities of water distribution and consumption in Africa

Tom O Okurut
Executive Secretary, Lake Victoria Basin Commission

Doreen M Othero

INTRODUCTION

Transboundary water systems on the African continent are resources that are shared by two or more countries, some of which form political boundaries between states. These water resources provide economic backbone to some of the riparian states and their inhabitants. However, the full potential of these shared water systems has yet to be realised and they are also a source of conflicts that have been experienced in Africa from time to time. In addition, many populations in African countries are faced with problems of uneven distribution and utilisation of water. These countries also face the challenge of allocating appropriate budgets for accessing water where technological options to do so are in place. Over the last two decades, various African governments have made considerable efforts towards institutionalising international water agreements, mainly the Helsinki Rules on the Uses of the Waters of International Rivers[1] and the Convention on the Law of Non-Navigational Uses of International Watercourses.[2] In addition, broader water governance principles that look beyond the watercourse to the land have informed the processes in the establishment of national and transboundary water governance arrangements in Africa. The launch of the African Ministerial Conference on Water (AMCOW) in 2002 galvanised countries to establish and strengthen transboundary water resource structures. AMCOW informed the processes, especially in the establishment of dedicated river and lake basin organisations to manage transboundary water resources. Although African countries have made great strides in applying international regulations and principles, there are still challenges, of which bureaucratic inertia and fear of change are the principal drivers. However, commitment and mutual trust by the riparian countries are key to the successful regulation of transboundary water resources, including investing in water provision where there are inequalities of availability of water. Better resources and efforts need to be devoted to the process of promoting cooperation.

BACKGROUND

Transboundary water systems – rivers, lakes and aquifers – are characteristic of the African continent where nearly all of these resources are shared by two or more countries and some form political boundaries between nation states.[3] The continent has over 80 major transboundary river and lake basins, and an equal number of groundwater basins, some of which are the largest in the world in terms of their geographical extent. These rivers and lakes, in combination with large aquifers, offer a great opportunity for developing and sharing the full potential of the water resources of the region for personal and household needs, hydropower generation, agriculture, navigation and several other societal needs. The full potential of these shared water systems has not been fully realised because the investment funding requirements for unlocking these potentials are lacking. In addition, full appreciation at all political levels and the institutional support that is a requirement for cooperation and sustainable utilisation of these water systems need to be greatly enhanced. Further, these resources are still a main cause of conflicts that are experienced from time to time.[4]

Over the last twenty years, considerable effort towards establishing mechanisms and institutions for the management and sustainable use of these international waters has been made by various African governments, inspired by international water frameworks and principles. The two most important agreements referred to are the Helsinki

Rules on the Uses of the Waters of International Rivers[5] and the Convention on the Law of Non-Navigational Uses of International Watercourses.[6] In addition, broader water governance principles looking beyond the watercourse to the land have informed the processes in the establishment of national and transboundary water governance arrangements in Africa and they include the Water Governance Concepts (WGC);[7] Integrated Water Resources Management (IWRM)[8] and Integrated Lake Basin Management (ILBM).[9]

INTERNATIONAL AGREEMENTS AND PRINCIPLES ON TRANSBOUNDARY WATER GOVERNANCE

The Helsinki Rules are regarded by several works as the first universal attempt to define a set of regulations that would guide the use of internationally shared rivers and lake systems. Indeed subsequent works have derived most of their basis from these rules. Two of the chapters from these rules – Equitable utilisation of an international drainage basin (chapter 2); and Procedures for prevention and settlement of disputes (chapter 6) – provide challenging aspects in practical application. The concept of equitable utilisation in the context of the varied development geometry of riparian countries of any basin in Africa has been difficult to sell (discussed later).

The Convention on the Law of Non-Navigational Uses of International Watercourses (adopted by the UN in 1997) concerns the use (other than navigation) and conservation of international water systems and covers both surface and ground water. (The groundwater aspect was not dealt with under the Helsinki Rules.) The principles of equitable and reasonable utilisation of international watercourses (Article 5) and the obligation not to cause significant harm (Article 7) are well stated. An elaborate procedure of peaceful settlement of disputes is defined in the convention (Article 33). The convention, though not in effect, owing to non-ratification by the critical mass of states, provided a framework that has been used to generate several bilateral and multilateral agreements on management of transboundary waters.[10] The implementation of agreements derived from these principles remains a daunting challenge in many of the countries.

The IWRM approach to water governance has informed many processes of water management put in place by African governments at national and transboundary level water resources.[11] According to the Global Water Partnership,[12] IWRM is a process which promotes the coordinated development and management of water, land and related resources in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems. IWRM is therefore a comprehensive approach to development and management of water since it addresses environmental sustainability aspects and provides a framework for provision of water services.

The IWRM concept is a response to the need to reconcile competing demands for water that are now more apparent owing to increases in populations and climate change. The reconciliation demands the establishment of appropriate and adequate water-resource-governance legal instruments, institutions and management tools at river basin, sub-regional and regional level. UN World Report 2006 defines four dimensions of water governance: social, economic, political and environmental sustainability.

The social dimension recognises the uneven distribution of water in time and space and points to equitable use of water to meet human needs in health, sanitation, livelihoods and other social arenas. The economic dimension brings to the fore the aspect of water as an economic good. Hence the emphasis is on efficient use of water resources to respond to the role of water in overall economic growth and poverty reduction.

The political dimension brings in the aspect of community or stakeholder participation at various levels of decisions on water governance. This particular aspect is well practised in the Nile River management frameworks.[13] This participation translates into the sustainability of administrative arrangements put in place for transboundary water resources management. The environmental sustainability dimension demonstrates that with governance, water resource sustainability, as well as ecosystem integrity, can be greatly enhanced. The link between environmental sustainability and water resource sustainability is currently a phenomenon that is understood in many African countries, especially because of unpredictable weather patterns. Calls for governments and communities to restore the ecosystem integrity of catchments are a common occurrence in Africa.

Although IWRM principles in general apply to lake water systems, lakes require more specialised management consideration because of their lentic (static) water properties. Hence a new concept of ILBM being advocated by ILEC[14] has been fully adopted in Africa for the management of transboundary lakes such as Lake Victoria and Lake Tanganyika;[15] and to a large extent in Lake Chad.[16] ILBM is premised on the knowledge that lakes are extremely sensitive to human activities in the surrounding catchment or watershed. Excessive environmental stresses from the catchment or watershed easily damage or compromise the natural capacity of the lake to restore itself. Consequently, the lakes and the basins/catchment/watershed must be managed as a single indivisible unit if sustainable resource use and conservation are to be achieved.

APPLICATION OF REGULATION OF INTERNATIONAL WATER UTILISATION

The two international conventions and the world-acclaimed principles of management of international waters have largely been integrated into the national and regional strategies of most African countries. The launch of the African Ministerial Conference on Water[17] encouraged and galvanised countries to establish or strengthen transboundary water resource structures. AMCOW critically examined the global water situation and its implication for Africa and consequently defined action areas that, when fully implemented, would contribute immensely to the adequate water supply of the region.

The four action areas that are particularly relevant to the implementation of the international agreements on water are to:

- Strengthen intergovernmental cooperation in order to halt and reverse the water crisis and sanitation problems in Africa
- Monitor progress in the implementation of major regional and global water resources and water supply and sanitation initiatives
- Enhance and solidify intergovernmental and regional cooperation in the management of shared waters, including surface and ground water
- Assess and where appropriate adopt best practices in global and regional programmes dealing with water and sanitation

These focus areas have informed the processes in the various countries, especially in the establishment of dedicated river and lake basin organisations (RLBOs) to manage transboundary water resources. There are currently eighteen established RLBOs in Africa: three of these are for lakes and the rest for river systems.[18] The mandates of the institutions are varied and range from simple cooperation such as advisory roles to complex cooperation where there are established structures with autonomous secretariats with funding mechanisms established and honoured by the constituting countries.

Four of the RLBOs, each representing one the four regions of Africa, are described in table 1 below.

An analysis of the mandates of all the African RLBOs reveals that the more recently established ones have integrated most of the aspects defined in the international water agreements and principles described above.[19] The older ones have mandates that target specific challenges.[20] However, a platform for sharing experiences and challenges in managing water resources has been established under the umbrella of the African Network of Basin Commission with the Secretariat of the Senegal River Commission (OMVS) serving as it headquarters. ANBO is an established sub-committee of AMCOW and is a useful information resource for the African Union (AU) of international water management in Africa.

In addition to the RLBOs, the international conventions on water resource management are reinforced through regional transboundary agreements (RTAs) developed within the framework of regional economic communities (RECs).

The most important agreement is the Southern African Development Cooperation (SADC) Protocol on Shared Water Courses.[21] The main objectives of the protocol are to ensure equitable sharing of water and its efficient conservation. Its general principles are similar to the provisions of the two international agreements (discussed above), as well as the IWRM principles. The protocol requiring member states to establish appropriate institutions to implement its provisions has been another

Table 1 Selected river and lake basin organisations in Africa

Basin name	River/lake system; date	Constituting countries	Mandate
Commission Intérnationale du Bassin Congo-Oubangui-Sangha (CICOS)	Congo, Oubangui, Kasai, Sangha; 1999	Democratic Republic of Congo, Republic of Congo, Central African Republic	To reduce poverty and promote interior navigation and management of transboundary water resources
Lake Victoria Basin Commission (LVBC)	Victoria; 2003	Burundi, Rwanda, Uganda, Tanzania, Kenya	Promote and coordinate sustainable development (holistic)
Orange-Senque River Commission (ORASECOM)	Orange-Senque, Vaal, Makhaleng, Fish; 2000	Lesotho, Botswana, South Africa, Namibia	Adviser on development, utilisation and conservation of water resources of basin
Organisation pour la Mise en Valeur du fleuve Sénégal (Organisation for Development of Senegal River) (OMVS)	Senegal; 1972	Senegal, Guinea, Mali, Mauritania	Water allocation, policy and project implementation

Source AMCOW and ANBO, Source book on Africa's river and lake basin organizations, 2007

stimulus in the creation of river basin organisations in southern Africa.

CHALLENGES IN APPLICATION OF INTERNATIONAL REGULATIONS

Many African countries have made great strides in applying the international regulations and principles in the governance of their water resources.[22] However, the varied geographical settings on the continent; country economies; politics and different social structures have influenced the extent and rate of adoption and implementation of agreements. It is no wonder that in Africa the water-poverty link is most visible.

The challenges arising from this variability are either generic or unique to specific basins. The major generic challenges that are applicable to all basins include a vast basin area with populations with varied interests; lack of sound data and data-sharing mechanisms; inadequate human resources and financing allocations; and varied levels of economic development among the riparian countries.[23] Other challenges that are applicable to only a few basins include drought and desertification; resource conflicts; and total dependency on donor funding.

There are challenges that arise from the practical difficulty of implementing specific aspects of these agreements and principles in transboundary environments. For example, application of IWRM principles in the management of international rivers is a challenge principally because the necessary enabling environments, institutional structures and management instruments are not yet in place, even at national level. Further, the involvement of actors outside the water sector is presumed, but wrongly so, since the existing national legal frameworks are still inclined towards strong sectoral tendencies in government institutions. More importantly, the absence of harmonised policies and laws among RLBO cooperating countries is a great hindrance to the application of the provisions of international agreements and must be addressed.[24] The Lake Victoria Basin Commission (LVBC), being an institution of the East African Community (EAC), is responding to this challenge more easily; it is harmonising its policies, laws and regulations as an undertaking that is being done in all areas of cooperation of the EAC.

Another challenge expressed by many managers of RLBOs is the limited or specific scope of their mandates. Yet, practically, the strong interrelation of water- and land-based activities requires a different but a holistic approach, as defined in the IWRM method. Renegotiation of constituting agreements is a recommended action. However, often the aspect of sovereignty hold-ups by governments often occurs whenever any of the contracting governments is not ready to yield positions in negotiations or when critical decisions must be arrived at.

The various socio-economic statuses of RLBO riparian countries are often a challenge at technical and financial level. Often, poorer riparian countries lose out to the richer countries that can marshal resources for more mechanised approaches in order to utilise the resource inequitably Furthermore, the powerful riparian states create unfavourable conditions on the ground with scant regard for co-riparian interests, which is done in the knowledge that although complaints may be dramatised by the media, effective repercussions will be muted. Alternatively, the powerful riparian countries may consistently divert the attention of other partners from real issues by providing cosmetic support to one of the several basin issues or tactically by engaging partners in protracted and meaningless negotiations to buy time for their planned investments.

INEQUALITIES IN WATER DISTRIBUTION AND CONSUMPTION IN AFRICA

The Abuja Ministerial Declaration on Water by AMCOW espouses the issues and concerns of the abundance and uneven distribution of water in Africa by nature and humankind.[25] The availability of water is an essential component for socio-economic development as well as for the crucial preservation of essential ecosystems on which our lives depend. The challenge faced by the African countries in meeting this scenario is allocating appropriate budgets for accessing water where technological options to do so are in place.

The United Nations World Development Report of 2006 gives a stark comparison of the uses of water on the various continents. The water daily use per capita in Europe ranges from 250 litres to 350 litres while in sub-Saharan Africa, it is a mere 10 litres to 20 litres.[26] The situation is worse for people living in slums and other informal settlements where the inhabitants can have only 5 litres to 10 litres, but in the affluent and middle-income areas in same cities the consumption ranges from 50 litres to 150 litres: a stark inequality.

Access to water in the rural areas in Africa is invariably lower than urban areas, but definitive government interventions can improve the rural status. A case in point is the recent (2009) inauguration of the Shinyanga-Kahama water supply project by the government of Tanzania. This project – with water drawn from Lake Victoria – was wholly funded by internal resources of government. The international funders had declined severally to fund this project for various reasons. This project, in addition to the two major towns, has connected 54 villages along the routes to these supply towns to a clean water supply.[27] This

is a demonstrable undertaking to illustrate that governments using own funds can provide water to their people, even in areas where water is scarce and it may not be economically viable for lending institutions.

On international waters, the current talks on interbasin water transfer from the Congo-Oubangui River to Lake Chad are a typical example of abundance and uneven distribution of water resources. Lake Chad waters have declined by almost 90 per cent for a number of reasons, including desertification and reduction of inflows from the rivers feeding it. The Congo River system on the other hand has sufficient flows, the excess of which drains into the Atlantic Ocean. Interbasin transfer is the logical option, but it is fraught with fears, political mistrust, and weak cooperation and information-sharing arrangements between the two responsible institutions, namely CICOS and the Lake Chad Basin Commission (LCBC).

CONCLUSION

The integration of the provisions of international water agreements and principles into the management of transboundary water systems in Africa has been gradual and no doubt it is taking root. Internal pressures on water resources, rapidly growing populations and international community commitments such as the Millennium Development Goals (MDGs) have given great impetus to African initiatives such as AMCOW, which is establishing appropriate water governance systems at national and regional level. There are still challenges, of which bureaucratic inertia and fear of change are the principal drivers. However, commitment and mutual trust by the riparian countries are key to the successful regulation of transboundary water resources, including investing in water provision where there are inequalities of availability of water. Better resources and efforts need to be devoted to the process of promoting cooperation.

NOTES

1 International Law Association, The Helsinki Rules on the Uses of the Waters of International Rivers, 1967, available at http://webworld.unesco.org/water /wwap/pccp/cd/pdf/educational_tools/course_modules/reference_documents/internationalregioinconventions/helsinkirules.pdf, accessed September 2009.

2 United Nations, Convention on the Law of the Non-Navigational Uses of International Water Courses, 1997. Available from http://untreaty.un.org/ilc/texts/instruments/english/conventions/8_3_1997.pdf, accessed September 2009.

3 AMCOW and ANBO, *Source book on Africa's river and lake basin organisations*, volume 1,2007, available from http://www.iisd.ca/africa/pdf/arc0404e.pdf, accessed September 2009.

4 EAC, Protocol on Sustainable Development of Lake Victoria Basin, 2004. Available from http://www.eac.int/lvdp/index.php, accessed September 2009.

5 International Law Association, The Helsinki Rules on the Uses of the Waters of International Rivers.

6 United Nations, Convention on the Law of the Non-Navigational Uses of International Water Courses. Available from http://untreaty.un.org/ilc/texts/instruments/english/conventions/8_3_1997.pdf, accessed September 2009.

7 Ibid.

8 Global Water Partnership, Integrated Water Resources Management Tool Box, version 2, Stockholm: GWP Secretariat, 2003.

9 International Lake Environment Committee Foundation (ILEC), *Managing lakes and their basins for sustainable use: A report for lake basin managers and stakeholders,* Kusatsu, Japan: ILEC, 2005.

10 EAC, Protocol on Sustainable Development of Lake Victoria Basin; and Nile Basin Initiative: The Draft Cooperative Framework for the Nile Basin, 2008, available at http://www.eac.int/lvdp/index.php, accessed September 2009.

11 Kenya Water Act: Water resources management approaches, 2002; Tanzania Water Act: Water basin officers, 1974; Stephen Brichieri-Colombi, *The world water crisis: Failures of resource management,* London: IB Tauris, 2009, available at http://www.water.go.ke/index.php?option=com_content&view=article&id=39%3Aspeeches-a-press-briefs&catid=25%3Aarticles&Itemid=1, accessed August 2009.

12 GWP, Integrated water resources management, Background Paper No 4, 2000, available at http://www.gwptoolbox.org/index.php?option=com_content&view=article&id=36:background-papers&catid=6:library, accessed 4 January 2010.

13 Nile Basin Discourse, available at www.nilebasindiscourse.org, accessed, 4 January 2010.

14 ILEC, Managing lakes and their basins for sustainable use.

15 Lake Tanganyika Authority, 2007, available at http://www.ilec.or.jp/eg/lbmi/pdf/22_Lake_Tanganyika_27February2006.pdf, accessed July 2009.

16 Lake Chad Basin Commission, 1964, available at http://www.britannica.com/EBchecked/topic/328117/Lake-Chad-Basin-Commission, accessed July 2009.

17 AMCOW, The Abuja Ministerial Declaration on Water – A Key to Sustainable Development in Africa, 2002, available at http://www.africanwater.org/amcow_declaration.htm, accessed July 2009.

18 AMCOW and ANBO, *Source book on Africa's river and lake basin organisations*.

19 Ibid.

20 Lake Chad Basin Commission, available at http://www.britannica.com/EBchecked/topic/328117/Lake-Chad-Basin-Commission, accessed July 2009.

21 SADC Protocol, Shared Water Course Systems, Article 2, 1998, available at *www.sadc.int/index/browse/page/159* -, accessed July 2009.

22 AMCOW and ANBO, *Source book on Africa's river and lake basin organisations.*

23 UNESCO-WWAP, United Nations World Water Development Report 2 (2006), 371–372); AMCOW and ABNO, Source book on Africa's river and lake basin organisations.

24 Kenya, Mau Forest Parliamentary and Media Publications, available at http://www.standardmedia.co.ke/blogs/?msg=blog&bid=386&id=1144028788, accessed July 2009.

25 AMCOW, The Abuja Ministerial Declaration on Water – A Key To Sustainable Development in Africa, 2002, available at http://www.africanwater.org/amcow_declaration.htm, accessed July 2009.

26 UNESCO-WWAP, United Nations World Water Development Report 2, available at http://www.unesco.org/water/wwap/, accessed July 2009.

27 Tanzania, Ministry of Water and Irrigation Report, 2009, available at http://maji.go.tz/modules/documents/index.php?PHPSESSID=51ae8af5142cc94c6ac0dfeca4c79c8c&direction=0&order=&directory=Water%20Sector%20Development%20Programme/WSSR%202009%20Bibliography, accessed July 2009.

Kenya's experience in managing climate change and water resource conflicts

The case of Gibe I, II, III

Silas Mnyiri Mutia
Ministry of Water and Irrigation, Nairobi, Kenya

INTRODUCTION

Whether they have come as prolonged droughts in Kenya, erratic fires in California, devastating floods in Bangladesh and West Africa, or melting ice in Iceland, the negative impacts of climate change are already upon us. Scientific evidence shows that its dangerous and destabilising consequences will increase with greater force, frequency and unpredictability. In Kenya, over ten million people are at risk of starvation owing to successive crop failures, resulting from erratic rain patterns. In addition to crop failure, their children are hungry, their fields are parched and their cattle are dying because of climate change that has been exacerbated by the country's state of unpreparedness. Kenyans, like the citizens of the world, are looking to their leaders to provide the level of leadership needed to respond to this unprecedented and historic challenge. Reducing deforestation and forest degradation, which will come only by moving people out forests, is a viable price that Kenyans will pay urgently to reverse the impacts of climate locally.

KENYA'S EXPERIENCE

Climate change has impacted negatively on Kenyan lives. This is evident from the increased frequency of droughts and decreased amounts of rainfall that is unreliable as well as erratic. This has led to massive power rationing, and water rationing. Globally new infectious diseases such as H1N1 or swine flu have affected thousands of people, including some Kenyans.

Climate change is a direct consequence of global warming resulting from depletion of ozone layer by greenhouse gases. The effects of greenhouse gases on ozone are worsened by degradation of forest cover, which acts as sinks for these gases.

In addition, the rising concentration of carbon dioxide and other greenhouse gases is leading to more extreme cold in Kenya, rising ocean levels, melting glaciers and ice sheets on Mt Kenya, droughts in the eastern part of the country and other climate changes. Even the biological status of the land and ocean is changing, with oceans such as Indian Ocean becoming more acidic – thus threatening coral reefs – as a result of higher carbon dioxide.

Like the global scene, actions that are needed at Kenyan level are difficult to introduce, because they go to the heart of the world's use of energy, particularly its use of fossil fuels (coal, oil, and gas), which, when burned, release carbon dioxide – the key source of rising greenhouse gases – into the atmosphere. Yet the world economy depends on fossil fuels, and developing countries will need to use more, not less, of them as their economies grow.

MANAGING CLIMATE CHANGE AND WATER RESOURCE CONFLICTS IN THE REGION

Until recently, Kenya's legislation on the environment was limited and vague. Kenya's constitution, which dates back to the colonial period, was geared towards resource exploitation. The administrative arm of the government was suited more to keeping law and order, therefore environmental protection was not a priority.

All this changed when the Environmental Management and Coordination Act (No 8 of 1999) was passed into law, creating institutions and providing the necessary legal backing for environmental protection. This was followed by the enactment of the Water Act (No 8 of 2002), which provided for water sector reforms that have led to the creation of new institutions to manage water. Further the Ministry of Water and Irrigation is finalising the

Transboundary Water Policy, which will help in the management of transboundary water resources.

Briefly, Kenya has responded well with legal as well as institutional frameworks that have been put in place to try to mitigate the effects of climate change. Kenya is also part of global efforts to cut carbon dioxide and other emissions into the atmosphere.

STATUS OF THE GIBE I, II, AND III PROJECTS

Gibe I and II are two hydropower projects on the tributary of River Omo (Gil Gibe River) upstream.

- Gibe I is designed to generate 184 MW on a small dam with a capacity of 839 million m^3. During a recent visit by a Kenyan delegation, it was found that Gibe I Dam had only a live storage of 1.5 metres high, which could drive only one turbine at half capacity. The dam itself had no enough impounded water.
- Gibe II, which is designed to use water from Gibe I through tunnels (26 km long), is under construction and is aimed at generating 420 MW
- Gibe III, which is on River Omo, is under construction (32% of the construction has been undertaken) at the confluence of the Rivers Gibe and Omo. It is the largest hydropower project ever undertaken in Ethiopia.
- It is estimated that it will be completed and commissioned by 2013. The position of Gibe III still leaves 33% of the River Omo catchment downstream. It will approximately 6 billion m^3 of water to Lake Turkana annually as the dam is 750 km upstream of Lake Turkana.
- The dam has a capacity of about 14 billion m^3 and impounding water into it is scheduled to start from 2011 and fill up in 2013. During this period Gibe III is designed to release flood flows through two tunnels measuring 14 m wide. Since the annual average flows into River Omo at Gibe III Dam are approximately 14 billion m^3 and the dam is planned to fill in two years, this means harvesting 7 billion m^3 water in the first year and another 7 billion m^3 in the second year. This leaves the same amount of water to pass through the dam during the filling period in the two years.
- The impounded water will be confined within the deep valley of the river course, with the tail water stretching 150 km upstream of the dam. This is a deep gorge that will reduce evaporation. Since the river has been flowing in the gorge for thousands of years with minimal channel losses, the water table under the gorge should be high, hence a great deal of seepage or water loss within the dam reservoir are not expected. This would have been revealed during the geotechnical survey that is a requirement of any dam before construction
- During the construction phase, three diversion tunnels – two are complete; and the third is under construction – will divert all incoming flows in the river and empty the same flows 1 km downstream into the river.
- In the unlikely event that all the turbines should not be operating, a tunnel has been designed below the spillway to release an environmental flow of 25 m^3/s to provide the minimum aquatic flow that is required up to 100 km downstream of the dam as the other 33 per cent of the River Omo flow joins downstream. The figure of 25 m^3/s was reached after analysing the base flows and it was found that this is minimum flow ever realised on the River Omo.
- Gibe III hydropower is designed to generate 1 870 MW of electricity. Hydropower generation by any standard is non-water consumptive and therefore the water will only run the turbines, and flow downstream.

CHALLENGES AND OPPORTUNITIES ASSOCIATED WITH THE PROJECTS

Possible challenges include:

- **Financial:** The Gibe III project in Ethiopia will cost $2 billion to complete, which is a major challenge.
- **Inadequate water**. This will result from:
  - Catchment degradation in Omo River that gives 20 billion m^3 of water annually or 90 per cent of Lake Turkana waters
  - Rain failure, leading to water scarcity in Ethiopia because Gibe I Dam had no impounded water. Even the power station at this dam was rationing power owing to lack of adequate water in the dam
  - Climate change – cyclic climate change

Opportunities

While the social and environmental costs of building this project are significant, Ethiopia would benefit from this dam. According to numerous analyses that weigh the costs and benefits of Gibe III, Ethiopia's electricity generation capacity will more than double when the dam is functioning, allowing economically debilitating power cuts to be reduced and electricity to be extended to at least some of the more than 70 per cent of the population without access. Power exports will bring revenue into the country, helping to lift annual per capita income above its current level of about $150. The project's water storage capacity will reduce the impacts of droughts. Finally, the impacts of floods will be reduced by 'taming' the Omo.

Water and food security in the Nile River Basin

Legislative, policy and institutional arrangements for cooperation

Kithure Kindiki
School of Law, University of Nairobi, Kenya

INTRODUCTION

Emile Lodwig, the famous German historian and geographer, made these remarks about the Nile when he visited Egypt and the Sudan in 1937:

> Every time I have written the history of man, there hovered before my mind's eye the image of a river, but only once have I beheld in a river the image of man and his fate.[1]

He was commenting during a global confrontation, on the eve of World War II, which brought the threat of war to the Nile Basin after the Italian occupation of Ethiopia. At that time, the whole basin was under the domination and influence of European powers.

Today, the situation around the Nile Basin is equally uncertain, in terms not only of possible future conflicts, but of other complexities of unprecedented dimensions, notably environmental stress and climate change. The population of the countries of the basin is expected to rise from the current 300 million to 800 million by the middle of the 21st century, while scientific speculations posit that the basin is among the areas most threatened by global warming and sea level rise, as a result of which one fifth of Egypt's most populated and productive lands may be subject to flooding.[2]

This paper is concerned with the consumptive utilisation of the Nile River resources in pursuit of water and food security in the basin states. It reviews the debate on the relationship between water scarcity in the Nile basin and possible inter-state armed conflict, and on the status in international law of the bilateral treaties on the consumptive uses of the Nile entered between Egypt, Britain and other powers before and during the colonial period.

The paper argues that even if water and food insecurity may not necessarily lead to violent inter-state conflict, water and food scarcity has nurtured political tensions among basin states, thus retarding the efforts towards sustainable development. Further, the current state of affairs, whereby riparian states' interests in the Nile basin are diametrically opposed, coupled with the sharp differences of opinions of basin states on their rights and duties under international law, suggests that traditional political methods of settling disputes such as negotiation or conciliation are unlikely to yield results in the foreseeable future.

As a result, some of the basin states will continue to delay or complicate political dispute settlement mechanisms. The chapter recommends a change in diplomacy to one of convincing basin states to submit the Nile question to some international judicial adjudication process. Pending such adjudication, there is need to strengthen national, sub-basin and basin-wide legal, policy and institutional approaches for the cooperative consumptive utilisation of the Nile water resources. This contribution is premised on the assumption that with the dilemma posed by water and food insecurity in the Nile basin, governments will choose to cooperate in the development of joint water management schemes for the benefit of all, based on the principle of equitable utilisation of shared resources, rather than go to war as the finite limits of available water supplies are reached.

WATER AND FOOD SECURITY IN THE NILE BASIN

The linkage between water and food security in the Nile basin is obvious, as water scarcity impacts negatively on agriculture and therefore on food security. Water scarcity

is probably the single biggest threat to food security anywhere in the world. Water and food security in the Nile Basin remain fragile. For instance, Egypt continues to strenuously defend its nearly 100 per cent dependence on the Nile waters to secure the livelihood of its ever-increasing population. The situation in arid Sudan is no better. Ethiopia remains a country of perennial droughts and famine, despite the country contributing a substantial volume.

Similarly in Kenya, another substantial contributor of water through six major rivers flowing into Lake Victoria, two thirds of the entire territory is classified as arid or semi-arid, where water and food remain scarce resources. Kenya has established the Lake Basin Development Authority (LBDA) to develop a master plan for the consumptive uses of its water for agricultural development, to the chagrin of Egypt. Tanzania, a contributor of approximately 25 per cent of the waters flowing into Lake Victoria, is grappling with its water and food scarcity through ambitious irrigation works under the aegis of the Kagera Basin Organisation (KBO), despite Egyptian opposition to these works.

The worsening of water and food security in the Nile Basin should enhance the need to comprehensively deal with the management of the quality and quantity of its water. Rapid population increase calls for equitable uses of the river to enhance basin-wide, as opposed to single riparian food security. By 2005, approximately 300 million people lived in the ten basin countries. Of these, about 160 million depended on the Nile and its tributaries. Within the next 20 years, the basin population is expected to expand to 580 million by 2025, increasing the water demand for agriculture and industry with a possible increase in drought and famine. There may be more erosion, soil degradation, pollution from chemical run-off from industry and agriculture and more water-borne diseases.

CONFLICT OVER THE NILE?

An undying divisive discourse over the Nile has revolved largely around the legality of colonial-era Nile Water treaties. While the Nile may be governed by the principles of treaty and customary international fluvial law, the only treaty principles governing its water use are the bilateral treaties between Egypt, Britain and other powers between 1885 and 1959. Under these treaties, upstream states committed themselves to respecting prior rights and in particular claims to the natural and historic rights to the Nile waters that Egypt asserted.

All these treaties, except the 1959 Agreement, were adopted when all co-riparians of the Nile (except Ethiopia) were ruled by foreign colonial powers. After the independence of the states in the basin, the legal issue was still whether treaty commitments made by predecessor states are binding on post colonial states. Because the lack of agreement on this question is responsible for the divergent positions adopted by upstream and downstream states, the legal status of these treaties is discussed briefly, before the current general norms of international law on shared water resources such as the Nile are considered.

Is the international legal regime established over the Nile through treaties concluded between Great Britain and other powers still operational or binding on Nile Basin states? The answer to this question is fundamental to the issue of upstream and downstream riparian rights and obligations over the Nile waters. If these treaties are valid and binding, they legitimise the legal order of the colonial period that gave Egypt pre-eminence in the control of the Nile and unimpeded use of the Nile for national development. This would pose a severe constraint on development efforts and opportunities of upper riparian states.

But if the Nile agreements are not binding, then the control and utilisation of its water are regulated by the general norms of international law (discussed below). This would imply that the Nile needs a new legal regime in the form of a basin-wide treaty. It would provide room for fresh negotiations among all basin states, and help develop a utilisation regime that is more sustainable and equitable.

The legality of the Nile treaties should be understood from the viewpoint of the principles of international law on state succession as and how that affects treaty obligations. State succession arises when one state is replaced by another, based on sovereignty over a given territory in conformity with international law. State succession may result from a merger, annexation, decolonisation or other event that alters the legal personality of a state (for example from a colony to an independent, sovereign state). Except for Egypt and Ethiopia, eight Nile Basin countries were dependencies of European states and emerged as newly independent in the twentieth century.

The effect of change of sovereignty on treaties is not a manifestation of general principles of rule on state succession. When a new state emerges, it is not bound by the treaties of its predecessor by virtue of a principle of state succession. Under the more dominant 'clean slate' doctrine (also known as the doctrine of non-transmissibility), a new state as a non-party cannot be bound by a treaty; nor can other parties to a treaty be bound to accept the emergent new state as a party based on the commitments of its predecessor sovereign. The rule on non-transmissibility applies both to succession of newly independent states (decolonisation) and to other appearances of new

states through the union or dissolution of states. To this general rule of non-transmissibility, there are two clear exceptions: law-making treaties or treaties evidencing rules of general international law (for example the UN Charter), and boundary treaties. The Nile agreements obviously do not fall into any of these categories.

Moreover, and independent of the non-transmissibility rule argument, the Nile treaties seem to have been extinguished by operation of the customary international law principle of *rebus sic stantibus*. This doctrine, also enshrined in the Vienna Convention on the Law of Treaties, 1969, posits that if the circumstances that constituted the essential basis of the consent of parties to be bound by a treaty undergo such far-reaching changes as to transform radically the nature and scope of obligations still to be performed, then such treaty may be repudiated. It is plausible to argue that the changes wrought by decolonisation are fundamental, and that basin states are at liberty to disown the Nile treaties under the doctrine of *rebus sic stantibus*.

It follows, therefore, that the position of Egypt to the effect that the agreements are binding in perpetuity, despite decolonisation, is dictated more by self-interest than by international law. The claims by upstream states that the Nile treaties are invalid in international law are sound, and the general norms of international fluvial law appear to support the view of upstream states more than they support the view of the downstream state of Egypt (see below).

But if the Nile treaties are invalid, only post colonial agreements are binding. The only one in this category is the treaty between Egypt and Sudan on the Full Utilisation of the Nile Waters (Nile Waters Treaty 1959). However, as a bilateral treaty, it does not bind the other basin states, in line with the maxim *pacta sunt servanda*, which implies that a treaty only binds parties that have agreed to its provisions. Nonetheless, the 1959 Nile Agreement has impacted the management of the basin beyond the territories of the two countries that are parties to that agreement. The agreement suffers from three deficiencies. Its allocation quotas are insufficient, even for Egypt and Sudan, owing to population increases and greater development capacities and needs. In addition, the agreement does not provide for issues that have gained importance in modern times, such as environmental protection and sustainable water management. Finally, the agreement applies to the entire basin, but was agreed between only two of the thirteen co-riparians. For instance, the agreement allocates no water even to Ethiopia – the major contributor to the Nile flow. In the absence of bilateral or multilateral agreements, basin states can be bound only by general norms of international law on the utilisation of shared water resources.

Neither the unilateral claims of Egypt on maintaining the status quo on the Nile, nor the threat by upstream states such as Tanzania, Uganda and Kenya to abstract the waters of the Nile-Victoria system are therefore supportable in law. The question remains, what needs to be done to move the Nile debate forward?

The potential for conflict over the Nile has long been identified, yet as the clock ticks away no practical solution seems to be forthcoming. Instead, scholars, diplomats, politicians, civil society, international society and other stakeholders continue to recommend more cooperative arrangements or simply downplay the potential conflict over the Nile. It has been argued that violent conflicts over the use of scarce water resources are more likely to be found at sub-national than at international level.

Yet a study by the United Nations Development Programme (UNDP) in 2005 warns that 'water wars' are likely to erupt where rivers and lakes are shared by more than one country.[3] According to this study, the Nile is one possible flashpoint. But even if the 'water war' hypothesis should be considered wrong, water and food scarcity in the Nile Basin may be a politically destabilising factor that may impair not only sustainable development in the basin states, but also intra-African cooperation in other areas such as regional integration for trade.

While the ongoing negotiations and cooperative initiatives remain key in addressing the water and food security question in the Nile Basin, an exit route out of the Nile impasse must be found. This paper recommends three approaches that upstream states need to initiate as a matter of priority, either simultaneously or consecutively: the conclusion of the negotiations and adoption of a new treaty binding all riparian states; the promotion of ratification of the 1997 UN Convention on the Law of the Non-Navigational Uses of International Watercourses; and the referral of the issue of the legality of the Nile treaties to a judicial or arbitral forum.

The first recommendation – negotiating a new treaty – seems to be in agreement with what happens around the world to give effect to evolving international water law. Basin states are coming together to agree by treaty on how best to achieve equitable utilisation of transboundary rivers and lakes, taking into consideration the concept of sustainable development as the bedrock on which international environmental law and policy is based[4] to convincing Egypt and other basin states to submit the Nile question to an international judicial process.

As a possible forum for judicial adjudication, the International Court of Justice (ICJ) currently enjoys a high degree of acceptability by African states as a forum of settling their disputes. The historical suspicions relating to the attitude of the court toward developing countries appear to have been addressed over the years. The court

has been able to resolve some of the most protracted territorial and frontier as well as maritime delimitation disputes involving African disputes, recent examples being the case of the land and maritime boundary between Cameroon and Nigeria *(Cameroon v Nigeria)*, relating to the question of sovereignty over the Bakassi Peninsula, and the dispute between Botswana and Namibia over Kasikili/Sedudu Island in River Cunene, and the legal status of the island.

The Nile issue could also be referred to an international arbitration tribunal. This may be more acceptable, since arbitration allows parties some leeway in determining the principles on which the dispute is to be settled. Arbitration may lead to building the necessary consensus for 'resolving' the dispute by producing a win-win situation, as opposed to judicial tribunals that end up 'settling' a dispute by producing a win-lose outcome.

LEGISLATIVE, POLICY AND INSTITUTIONAL ARRANGEMENTS FOR COOPERATION IN THE NILE RIVER

There are at least six principles of contemporary international law on the consumptive uses of international watercourses. A cursory review of each of these principles reveals that the first three are outdated, while the last three seem fairly anchored in law.

The first is the doctrine of absolute territorial sovereignty. In its absolute form, this doctrine (the Harmon doctrine) posits that states have absolute sovereignty over all water in their territory and may use it as they please, including extracting as much of it as possible or altering its quality, regardless of the consequences of this use on the supply of water on downstream or contiguous states.[5] US Attorney General Judson Harmon propounded this doctrine, asserting the 'right' of the US to divert the waters of the Rio Grande:

> The fact that Rio Grande lacks sufficient water to permit its use by the inhabitants of both countries does not entitle Mexico to impose restriction on the US which would hamper the development of the latter's territory or deprive its inhabitants of an advantage within which nature has endowed it and which is situated entirely within its territory. To admit such a principle would be completely contrary to the principle that the U.S. exercises full sovereignty over its natural resources.

This doctrine appears to be founded on the basic international law principle that there is absolute sovereignty for every nation as against all others within its territory.[6] It is favoured by upstream states, because it is an extreme theory that completely ignores the rights of downstream states. However, the doctrine has remained unpopular, with the great majority of writers emphatically rejecting it.[7] Even the US quickly retracted from the full Harmon doctrine in subsequent treaties with Mexico and Canada.

Even if the Harmon doctrine were to be accepted by writers, it fails to appreciate that under international law, states have not only territorial sovereignty, but 'territorial duties' as well. One such duty is encapsulated in the customary international law maxim *sic utere tuo ut alienam ad laedas* ('use your property in such a manner so as not to disturb others'), which creates an obligation for states not to conduct or permit activities within their territory that may be harmful to the territories of other states.[8] Reiterating this customary principle, the arbitral tribunal in the well-known Trail Smelter Arbitration (1938–1941), which involved transboundary pollution, ruled that: 'No state has a right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or to the properties or persons therein.'[9]

The second theory is that of absolute territorial integrity. It espouses an old common law of water rights whereby a lower riparian state has the right to the full and uninterrupted flow of water of natural quality. The upper riparian may not interfere with the natural flow without the consent of downstream states. This principle, which is favoured by downstream states and was the basis of the 1929 and 1959 Nile treaties, is curiously also based on the 'good neighbourliness' doctrine espoused in the *sic utere tuo* maxim.

A major criticism of the absolute territorial integrity theory is that, like its absolute sovereignty counterpart, it is an extreme doctrine that creates something akin to veto rights in favour of downstream states against upstream states. Current law on international watercourses, as espoused in the 1997 UN Convention, rejects the radical approach and endorses a legal scheme that balances rights and duties for upstream and downstream states. According to Godana,[10] the theory of absolute territorial integrity may also be regarded as having been discarded.

The third principle is that of prior appropriation rights or, to use the words used in Nile Treaties, 'natural and historic rights' to internationally shared rivers. According to this principle, any riparian that puts the water of an internationally shared river to use first establishes prior and incontestable rights over the particular use. Although in theory this principle favours neither upstream nor downstream states and therefore appears equitable *prima facie*, it is restrictive and unworkable.[11] The theory's weakness is that the state that puts the waters of an internationally shared river into use first enjoys veto rights over others, an undesirable scenario that seems unsupported by the 1997 UN Convention and other sources of international fluvial law.

The fourth is the principle of limited territorial sovereignty and integrity.[12] The theory advances qualified sovereign and territorial claims over international watercourses. By it, co-riparian states have reciprocal rights and duties in the use of the waters of a transboundary water river. In effect, the principle makes the river some kind of *res communis* (common property), a legal notion that has attained great consensus in similar resources in the high seas, air and outer space. Although the outer space aspect refers to resources beyond the national jurisdiction of states and therefore the common heritage of all mankind, internationally shared rivers in a manner of speaking are also local common heritage, for all mankind in the basin states.

The fifth principle is that of equitable utilisation, already hallowed in treaty and customary international law. It is the most widely endorsed theory that treats international watercourses as shared resources subject to equitable utilisation by all riparian states.[13] The doctrine rests on the foundation of equality of rights and relative sovereignty, but should not be confused with equal division. It calls for accommodation of the interests of all riparian states.

Equitable utilisation as a principle of international law has found support from case law, state practice, treaties and other codifications. In the River Order Case, the Permanent International Court of Justice (PCIJ), which is the progenitor of the International Court of Justice (ICJ), invoked the exigencies of justice and considerations of utility, favouring 'a community of interest' in the utilisation of an internationally shared river by all riparians, based on equality of rights on the whole of the navigable part of the River Order. Although this case involved navigation, the same principle is applicable to the consumptive, non-navigational uses of international watercourses.

It is this vein that the Helsinki Rules, fashioned in 1966 by experts under the aegis of the International Law Association (ILA), recognises the right of co-riparians to 'equitable and reasonable share in the beneficial uses of the waters' (Article IV). This position is endorsed by the 1997 UN Convention on International Watercourses, which provides that watercourse states shall in the respective territories utilise an international watercourse in an 'equitable and reasonable manner' (Article 5(1)).

While the precise meaning of the term 'equitable utilisation' is the subject of future judicial or arbitral interpretation, guidance may be sought from the Helsinki Rules as well as the codification of the International Law Commission (ILC) in its report to the UN General Assembly in 1994 during the drafting of the 1997 UN Convention. According to the Helsinki Rules, 'equitable utilisation' is to be determined in all the relevant factors, which include geography, climate, hydrology, prior utilisation of the waters, economic and social needs of each state, the availability of other resources, avoidance of waste in the utilisation of the water, and the practicability of compensation to one or more riparian states as a means of adjusting conflicts among the needs and uses of each riparian state.

The ILC on its part identified these factors to be considered in determining what amounts to reasonable and equitable utilisation:

- Geographical, hydrographic, hydrological, climatic, ecological and other factors of a natural character
- Social and economic needs of the watercourse states concerned
- The population dependent on the watercourse in each riparian state
- Effects of the use(s) of the watercourse state on other riparian states
- Existing and potential uses of the watercourse
- Conservation, protection, development and economy of the use of the water resources and the costs of measures taken to that effect
- Availability of alternatives of corresponding value to a particular planned or existing use

This list of factors is not exhaustive, but rather indicative. Nor does it create a hierarchy or weight to each factor. Such circumstances will depend on each case.

The sixth and final principle is that of common basin-wide management of international watercourses. Also well grounded in international law, this theory presupposes that internationally shared rivers and lakes are most efficiently managed as integral units. The theory stems from the consideration that international watercourses do not respect national frontiers across which they flow. Thus, proponents of this doctrine insist on a community approach management that downplays political boundaries and regards an international watercourse as a single economic and geographic unit.

Treaties in which the common management doctrine has been incorporated include the Agreement on the Action Plan for the Environmentally Sound Management of the Common Zambezi River System,[14] the Treaty on River Plate and its Maritime Limits,[15] and the Treaty for Amazonian Cooperation.[16] Other international codifications that endorse the common management theory include the 1972 Stockholm Declaration on the Human Environment (Article 2(5)(a)), and the 1977 UN Mar del Plata Water Action Plan. The principle forms Article 24(1) of the 1997 UN Convention providing that:

> Watercourse states shall … enter into consultations concerning the management of an international

watercourse, which may include the establishment of a joint management mechanism.

The rather omnibus common management doctrine generates an array of other more specific principles. These include the general duty for each state to cooperate with co-riparians, and the procedural requirements of prior notification of intended projects involving the water resources of an international watercourse, as well as the duty to consult other riparians and negotiate with them where objections to the intended utilisation arises.

Finally, the Sustainable Development Protocol[17] informs interstate cooperation in the areas of water resources, fisheries, agricultural and land-use practices, irrigation, wetlands, environment in general, and wildlife, among others. This agreement incorporates many of the UN Convention's substantive and procedural rules, such as the principle of equitable utilisation and the states' duty to protect aquatic ecosystems. Also in conformity with the convention, the Lake Victoria Protocol requires states to notify one another on activities that may have transboundary effects and to adopt measures to prevent ecological harm to neighbouring states, including monitoring potentially risky activities or natural phenomena. The Lake Victoria Protocol, however, is more detailed than the UN Convention in that it includes provisions on the 'polluter pays principle', on the prevention of pollution at the source, on other actions relative to environmental protection, on public awareness, on planning and infrastructure, etc. The protocol also establishes the Lake Victoria Basin Commission (LVBC).[18]

The cooperative arrangements for Lake Victoria suffer from a number of weaknesses. First, the multiplicity of initiatives is causing project 'fatigue' to sub-basin states and threatening future commitments. Second, a multiplicity of initiatives is drawing heavily on human and financial resources of these states, although most of the initiatives are largely donor funded. Third, lack of clear, well-thought-out long-term linkages between the sub-basin initiatives and the basin-wide activities poses the threat of convoluting attempts to build synergy at the two levels. However, the level of cooperation in the EAC is very high. Granted, promoting the ratification and implementation through the EAC remains an important approach.

The Kagera Sub-Basin: In 1977 the Agreement Establishing the Kagera Basin Organisation (KBO) was adopted in Rasumo, Rwanda.[19] The sub-basin states involved in this cooperation are Rwanda, Burundi, Uganda and the DRC. Cooperation under the auspices of the KBO failed largely owing to political differences between Rwanda and Uganda and huge arrears of member state subscriptions. In 2001, the sub-basin activities of the KBO were taken over by the better-funded basin-wide Nile Basin Initiative (NBI).[20] The KBO therefore does not offer any opportunity for promoting the ratification and implementation of the UN Watercourses Convention.

The Congo Sub-Basin: Water management is not largely carried out in the Congo River Basin, even though the river has great potential to improve water and food security in the sub-basin. Environmental management in the region focuses mainly on the protection of the forest and national parks, but such policies and programmes should also consider and apply to the River Congo itself, so the whole drainage area of the Congo could be preserved and managed sustainably.[21]

Effective trans-border, basin-wide water management, based on joint strategies and principles, has not taken place so far among all of the Congo riparian states. There is neither conclusive agreement on the mode of coordinating large infrastructural measures, nor an effective general concept for joint sustainable development of water resources.

Like the Nile basin, however, portions of the Congo watershed are subject to partial agreements, that is, agreements adopted among only some of the basin states. In 2003, the Democratic Republic of the Congo, Cameroon, Republic of the Congo, and Central African Republic ratified an accord setting up the International Commission of the Congo-Oubangui-Sangha Basin (CICOS). This is the first step in strengthening cooperation in the areas of shipping and water pollution control.[22] The same agreement establishes joint principles and strategies by which riparian countries manage the Congo Basin. To this end, cooperation is to be improved first in the fields of domestic shipping and water resource management.

CICOS's main success lies in networking, by bringing together national actors from among member states in working groups, roundtables, seminars and joint training sessions. Through funds from the German Technical Cooperation (GTZ) and the Global Environmental Facility (GEF), CICOS has also promoted information sharing, and is encouraging joint investments in shipping and water quality maintenance. Notably, CICOS is currently encouraging riparian states of the Congo River system to include international agreements in their national laws. The campaign to promote ratification of the UN Watercourses Convention can, therefore, benefit greatly from this initiative.

The treaty establishing the Central African Forests Commission (COMIFAC) was signed in 2005 by ten countries meeting in Brazaville.[23] The treaty is the first-ever region-wide conservation treaty in Africa, giving ample powers to COMIFAC regarding forest management.[24] Given the large number of countries involved in COMIFAC, this organisation could be used to promote the ratification of the UN Watercourses Convention.

The NBI represents the best avenue for promoting ratification and implementation of the UN Watercourses Convention. There are structures for collaboration, including a full-fledged secretariat; the goodwill and levels of collaboration among basin states are at their highest; and the NBI provides an opportunity to promote the convention to all the basin states in one swoop.

Although this paper is not concerned with appraising the existing cooperative framework regarding the Nile Basin, a brief mention of two initiatives is appropriate: the Nile Basin Initiative (NBI) and the Nile Basin Discourse (NBD). The NBI, involving all basin countries except Ethiopia, has the ambitious goal of establishing regional cooperation and mutually beneficial relationship between the basin states. The initiative, therefore, is to achieve sustainable socio-economic development through equitable utilisation of, and benefit from, the common Nile Basin water resources.

On its part, the NBD was conceived to respond to the challenges of involving civil society within the NBI so as to bring in the voices of stakeholders other than government in the furtherance of the ideals of the NBI. To achieve this purpose, the NBD promotes dialogue and sharing of ideas with the aim of eradicating poverty, promoting sustainable and equitable development and ensuring peace and mutual understanding in the Nile Basin.

CONCLUSION

This paper has demonstrated that national constitutional and legal frameworks in the Nile Basin riparian states are crafted in a manner that is oblivious of the shared nature of shared/trans-boundary water resources, perhaps the only exception being the Egyptian water policy. In other states, water laws remain largely silent on the principles and procedures applicable to the use and management of international watercourses. Overall, national laws and policies do not acknowledge transboundary water resources, nor do they appreciate the need for basin-wide cooperation for the sustainable utilisation and management of such resources. Ratification and implementation of the UN Convention could go a long way towards institutionalising a standard normative framework among all basin states.

At regional level, the Nile is governed by colonial-era treaties whose legal status today is the subject of debate in the context of state succession and the effect of de-colonisation on prior treaty obligations. Other more recent Nile agreements applicable to the entire basin fail to address the interests and rights of all co-riparians. The recent sub-basin agreements incorporate modern developments of international water law, but cover only portions of the basin and, again, do not involve all basin states.

Although Eastern African states have come together to constitute the NBI, CICOS, and COMIFAC, as well as sub-basin arrangements concerning Lake Victoria, there nonetheless exists the rationale for and benefits of ratifying and implementing the UN Watercourses Convention as the common normative benchmark for a basin-wide approach to the utilisation and management of the shared water resources in Eastern Africa.

The convention could supplement, not replace, basin-wide and sub-basin frameworks in Eastern Africa. As a framework law, the convention allows riparian states to customise it to regional and national needs and may supplement regulatory gaps in basin-specific agreements. The reflection of modern international fluvial law in the UN Convention should catalyse its entry into force and the speedy adoption of side watercourse agreements to implement its provisions. Furthermore, the convention is likely to spur the revision of individual constitutional and legal frameworks of individual basin states to synchronise them with the convention's normative framework.

However, mere ratification of the convention by countries is not enough. There is need for domestication of the convention's provisions into national law. This should be accompanied by initiatives supporting the implementation of the convention through the creation and improvement of governance mechanisms within the basin.

There should be a three-pronged strategy for promoting ratification of the UN Convention in Eastern Africa. First, there should be effort to promote the convention through the basin-wide institutional arrangement – the Entebbe-based Nile Basin Initiative (NBI). Two, the ratification of the convention can be promoted through three out of the four sub-basin frameworks: the Arusha-based East African Community where various cooperative initiatives on Lake Victoria are established; the International Commission on the Congo-Oubangui-Sangha Basin (CICOS); and the Central African Forests Commission (COMIFAC). The third sub-basin initiative, the Kagera Basin Organisation (KBO), has since become dysfunctional and its projects are now spearheaded by the NBI. Fourth, the last strategy to promote ratification of the convention should target individual countries.

The ecological integrity of the Nile Basin (and therefore the water and food security in the basin) is hinged on a new framework of cooperation espoused in a new treaty and buttressed by ratification of the 1997 UN Convention on the Non-Navigational Uses of International Watercourses. If this cannot be achieved *uberimae fidei* (in good faith), then the legal option left is to refer the dispute over the Nile on the Nile Agreements to an international judicial and arbitral tribunal. Governments, civil society, the international community and other stakeholders have a joint role to promote such approaches.

NOTES

1 Y Mageed, The Nile Basin: Lessons from the past, in International Waters of the Middle East, edited by A Biswas, 1994, 156, 175–76, as quoted in C Carroll, Past and future legal framework of the Nile River Basin (2000), 12 *Georgetown International Environmental Law Review* 269 (1994), 156.

2 Mageed, The Nile Basin, 156.

3 United Nations Development Programme (UNDP), 2005, available at http://www.undp.org/, accessed August 2009.

4 Understanding Sustainable Development: A Complex and Contested concept, available at http://www.fathom.com/course/21701763/session2.html, accessed September 2009.

5 Patricia Kameri-Mbote Water and Food Security in the Nile Basin, available at http://www.springerlink.com/content/w20rw20328j440j1/, accessed August 2009.

6 E Kasimbazi, The relevance of sub-basin legal and institutional approaches in the Nile Basin, 5 *S Afr J Envtl L & Pol'y* (1998) 20.

7 Patricia Kameri-Mbote Water and Food Security in the Nile Basin, available at http://www.springerlink.com/content/w20rw20328j440j1/, accessed August 2009.

8 Ibid.

9 Ibid.

10 Ibid.

11 Ibid.

12 Ibid, 22.

13 UNEP 1957, para 86, available at http://hqweb.unep.org/ozone/Meeting_Documents/oewg/11oewg/11oewg-4.e.doc, accessed September 2009.

14 1988, 28 ILM 1109.

15 1973, 13 ILM 242.

16 1978, UNTS.

17 Protocol for Sustainable Development of Lake Victoria Basin, available at http://www.iwlearn.net/publications/ll/lakevictoria_2005.pdf, accessed August 2009.

18 See Sustainable Development Protocol Articles 5–6, 12, 14.

19 1089 UNTS 165; adopted 24 August 1977; entry into force 5 February 1978.

20 See *East African*, 13 August 2001; available at www.nationaudio.com, accessed September 2009.

21 Young Water Action Team, available at www.ywat.org, accessed 11 January 2009.

22 GTZ, Transborder water management in the Congo Basin, available at http://www.gtz.de/en/themen/umwelt-infrastruktur/wasser/18950.htm, accessed 11 January 2009.

23 Burundi, Cameroon, Central African Republic, Chad, Congo Brazaville, the Democratic Republic of Congo, Equatorial Guinea, Gabon, Rwanda and Sao Tome.

24 GTZ, Transborder water management in the Congo Basin.

25 Article 2, UN Watercourses Convention.

26 Ibid.

27 Article 3, UN Watercourses Convention.

28 Article 4(2), UN Watercourses Convention.

29 See Stephen C McCaffrey, An overview of the UN Convention on the Law of Non-Navigational Uses of International Watercourses, *Journal of Land, Resources and Environmental Law* 20 (2000), 57, 58

30 Hungary/Slovakia 1997, *ICJ* 7 (25 September 1997),80.

31 The doctrine of 'absolute territorial sovereignty', which would support such unfettered discretion, has long been rejected by the state which invented it (the US). See Stephen C McCaffrey, The Harmon Doctrine one hundred years later: Buried, not praised, *Natural Resources Journal* 36 (1996), 965.

ANNEX I

4.4.4 UN Convention on the Non-Navigational Uses of International Watercourses, 1997

The UN Watercourses Convention is a general framework treaty consisting of 37 articles, which are divided into seven parts and an annex on arbitration. Its most important substantive and procedural provisions are contained in Part II (General principles), Part III (Planned measures), and Part V (Protection, preservation and management). Also important is Article 33, governing dispute settlement. As a framework treaty, the convention lays down a basic normative framework, leaving the details for riparian states to complement in agreements that take into account the specific characteristics of the watercourses in question. This section briefly discusses specific articles that are of particular importance for this study.

The convention defines an 'international watercourse' as 'a watercourse parts of which are situated in different states'.[25] The term 'watercourse' includes both 'surface water and ground waters constituting by virtue of their physical relationship a unitary whole and normally flowing into a common terminus'.[26] This definition is not only broader than the understanding of an international watercourse as merely an international river, but takes into account that most fresh water is underground and that most of this groundwater is related to, or interacts with, surface water. Thus, pollution of surface water can contaminate groundwater, and vice versa, just as withdrawals of groundwater can affect surface water flows.

Articles 3 and 4 relate to watercourse agreements existing before and after a watercourse state becomes a party to the convention. Article 3 generally encourages states sharing watercourses to enter into agreements that apply and adjust the provisions of the convention to the particular characteristics of the watercourse concerned. As for existing agreements, they are not affected by the

convention, but parties may consider harmonising them with the convention's basic principles.[27]

Article 3 also addresses the situation in which not all of the states sharing a watercourse enter into an agreement concerning its use. In that case, the agreement may not adversely affect uses of other states on that watercourse without their consent. When a riparian state believes that a more specific regulation of the watercourse is necessary, Article 3 requires watercourse states to enter into consultations in good faith, with a view to negotiating an agreement.

For future agreements, Article 4 specifies the rights of riparian states to participate in specific agreements that apply to an entire international watercourse and those that apply only to a part of the watercourse or to a particular project, programme or use.[28]

Part II is the core of the convention. Articles 5–7 introduce the key principle: the principle of equitable and reasonable utilisation and the obligation to prevent significant transboundary harm. Many regard equitable and reasonable utilisation as the cornerstone of the law of international watercourses. Under that principle, a state must use an international watercourse in a manner that is equitable and reasonable vis-a-vis other states sharing the watercourse.[29] States thus have a right to an equitable share of the uses and benefits of an international watercourse. The International Court of Justice (ICJ), in the Gabcikovo-Nagymaros case, confirmed the centrality of this principle when it emphasised the importance of operating the project involved in the case 'in an equitable and reasonable manner'.[30]

The circumstances to be taken into account in determining equitable and reasonable utilisation may include geographic, hydrographical, hydrological, climatic, ecological and other factors of a natural character; the social and economic needs of the watercourse states; the population dependent on the watercourse in the watercourse state; the effect of the use or uses of the watercourse in one watercourse state on other watercourse states; existing and potential uses of the watercourse; conservation, protection, development and economy of the water resources of the watercourse and the cost of measures taken to that effect; and the availability of alternatives of comparative value to a particular planned or existing use.

According to Article 5, to be equitable and reasonable, the use must pursue the sustainability of the watercourse and be consistent with its adequate protection against pollution and other forms of degradation.

The other obligations in Part II include the duty to cooperate through, *inter alia*, the establishment of joint mechanisms or commissions and the regular exchange of data and information.

Part III is about planned measures, obliging watercourse states to notify other riparians of planned measures that may cause significant adverse effects across international borders. The notification requirements are buttressed by provisions on period of reply; reply to notification; absence of reply; consultation and negotiations concerning planned measures; procedures in the absence of notification and urgent implementation of planned measures. Those provisions reject the notion that a state has unfettered discretion or absolute sovereignty allowing it to do as it wishes with its portion of an international watercourse.[31]

Environmental protection of international watercourses is dealt with under Part IV, Articles 20–26. This part establishes a number of obligations relating to the protection and preservation of ecosystems, preservation, reduction and control of pollution, introduction of alien and new species and the protection and preservation of the marine environment. Article 33 and the annex deal with dispute settlement methods and procedures.

What would be the relevance of this convention to Eastern African states that are not covered by any watercourse agreements or are covered only by partial watercourse agreements? The convention is relevant to such states since as customary international law or *de lege ferenda* (depending on how a particular state views the convention), such states, in applying the convention, would be employing general principles of international law. Secondly, the convention would supplement any gaps in the existing national or international normative framework or provide such a framework where none exists. Third, the convention, being a framework convention, would leave room for these states to negotiate regionally appropriate frameworks while at the same time operating within existing international law. It is this duality of application that should attracts such states to the convention.

Session II

The role and the experiences of African governments and intergovernmental agencies in addressing climate change and managing transboundary water conflicts

Challenges of cooperation on the Nile River

An Ethiopian perspective

Minelik Alemu Getahun[1]
Director-General for International Law and Consular Affairs, Ministry of Foreign Affairs of the Federal Democratic Republic of Ethiopia

INTRODUCTION

This paper was prepared for the Experts Roundtable Workshop, organised by the Institute for Security Studies (ISS) in Mombasa, Kenya, on 29 and 30 September 2009. The title of this roundtable, 'Climate change and transboundary water conflict in Africa: Legal, policy and institutional challenges', itself deserves some comments before going into the substance of this paper.

The term 'water conflict' may not be the most appropriate way of framing a discussion that is intended to focus on the possibilities of greater cooperation over transboundary water resources. Phrases such as 'water conflict' and 'water wars' are most often used to describe tension in transboundary water discourse. These phrases certainly attract attention, but risk being alarmist. They may not reflect the situation on the ground.

It is, therefore, imperative that we reflect thoroughly on the implications of the topics we choose and the position we advocate in roundtables, workshops, and publications. The danger here is that in an effort to attract the widest possible attention we perpetuate the myth of impending calamities. Provoking public fear or anger could have the unintended consequence of entrenching fixed positions and creating populist pressures and pronouncements – making negotiations more difficult than they already are. This does not mean that the geopolitics of transboundary rivers, including the Nile, do not create passion and confrontation.[2] They do, and not least when some countries have pursued policies that are not conducive to the creation of possibilities for equitable arrangement based on mutual accommodation.

This leads to the question of how we should characterise a situation where there is divergence that is not yet the object of a compromise. The competition over the utilisation of shared water resources has many aspects and facets involving legal, political, or environmental considerations. In fact, one paper asserts that

> Water scarcity and environmental degradation obviously do not automatically lead to violent conflict. On the contrary: the use of transboundary watercourses offers strong incentives for cooperation between riparians.[3]

Another keen observer of developments in the Nile Basin recognises the potential for conflict but makes the point that

> ... water disputes lead to cooperation rather than armed conflict. Particularly today, as more emphasis is given to joint responsibility for sustainable management of the shared resources, it is quite likely that advance planning and more sophisticated technology may ease the tension in the Nile Basin and even avert conflict.[4]

As an alternative to doomsday scenarios or terms, to call these tensions 'disputes' might not be considered an understatement, given that it is common to observe differences over the applicability of certain treaties or over volumetric allocation or on sharing benefits. The situation in the Nile Basin is ideal for such treatment.

This brief paper will thus address the challenges of cooperation over the Nile. These include the achievements and challenges of the Nile Basin Initiative (NBI), the impediments to sustained cooperation in the Nile Basin, the role of governments and non-governmental organisations in the joint management of shared resources, the cardinal principle of equitable and reasonable utilisation of the Nile Basin, and the inclusion of non-water issues in the Nile River Cooperation. The discussion on these

items will draw on the experience of Ethiopia in managing transboundary waters, with particular focus on the Nile, and efforts to arrive at a cooperation framework. The paper will conclude by proposing some ideas on possible ways of moving forward cooperation on the Nile.

ACHIEVEMENTS OF THE NILE BASIN INITIATIVE

The Nile Basin Initiative (NBI) is the sole all-inclusive framework for cooperation over the Nile, comprising Burundi, Egypt, Ethiopia, Kenya, Democratic Republic of Congo, Rwanda, Sudan, Tanzania, and Uganda, while Eritrea retains observer status. This in itself could be considered an achievement. That these nine participating countries were able to formulate joint transboundary policies, programmes and projects speaks volumes and demonstrates the power of cooperation over confrontation and mutual mistrust. It is thus critical to emphasise the inclusive nature of NBI as an important achievement that provides a common forum for the ten countries to try to bridge their differences and establish a lasting arrangement. This is in contrast with previous initiatives with the limited scope, membership and interests that these sought to accommodate.[5]

In a change of policy, Ethiopia joined the NBI transitional arrangement. It was a radical change for a country that had cautiously monitored, from a distance, previous attempts to establish new arrangements. Ethiopia shunned previous such attempts since they were not designed to address inequities in the basin. They were more intended to perpetuate hegemonic reallocation of the shared water resources.[6] Ethiopia preferred to wait for an international situation that was more conducive to such a significant undertaking.

Three aspects of the Nile situation identified by Brunneé and Toope appear to tally with Ethiopia's consideration:

> ... recognition of increasing resource limitations caused by population growth, environmental degradation and the need to share water more widely; exploration of various modalities for cooperation that are not susceptible to hegemonic control; and understanding the changing normative framework that both renders past positions untenable and promotes positions that are more reflective of the basin states' collective concerns.[7]

Furthermore, Ethiopia's participation in the NBI reflects the country's conviction that the new effort could help to reverse the status quo and that mutual benefits could be drawn from collaborative efforts regarding the Nile, including the possible financing of development projects and the provision of technical support. Moreover, the country believed that mutual confidence between riparian countries would be developed through joint projects.

The basic tenets of Ethiopia's position have been articulated in its Foreign Affairs and National Security Policy and Strategy, which was published in November 2002. Ethiopia has opted for a realistic, cautious but optimistic attitude towards future cooperation over the Nile.[8] The NBI has not been entirely disappointing in meeting its shared vision: 'To achieve sustainable socio-economic development through the equitable utilization of, and benefit from the common Nile River Basin water resources.'[9]

NBI has succeeded in creating some level of mutual understanding among the riparian states – at least for the last ten years – while member states have been engaged in the negotiation process of the River Nile Cooperative Framework Agreement (CFA) and are undertaking collaborative activities. Although the CFA is potentially one of NBI's greatest achievements, it could jeopardise NBI's current setup and gains.

For the first time in the history of the Nile, the riparian countries are on the verge of reaching a comprehensive agreement on the utilisation of the river. The process of negotiation itself has taught the negotiators and the authorities in various countries a great deal about the intricacies of the relatively new and still developing field of international water law.[10] The negotiations have successfully addressed the quasi-totality of the substantive provisions of the agreement, including the institutional setup of the Nile River Basin Commission (NRBC).

The approach of the negotiators was to resolve the easier issues before tackling the more difficult ones. This was an important decision because the lack of trust among riparian countries still needed mending. This approach helped the negotiators to agree on almost all the articles of the framework agreement. However, there are still reservations over the most critical issue after more than ten years of negotiation, particularly on article 14B, which deals with water security. This approach gave momentum to the negotiation and enabled the riparian states to formulate the most modern and advanced set of provisions aimed at establishing the NRBC with all the necessary principles and structures. It could become the standard-bearer for other basins throughout the world. Of course, it has yet to be tested in practice.[11] There lies the greatest challenge.

The NBI has helped raise the level of awareness on various aspects of water use and the possibilities of joint development among riparian states. This was done through public discourse instruments.[12] The media activities, although occasionally prone to sensationalism, have begun to cover NBI activities in a more informed and

educated manner, involving more journalists from the basin than was customary. It is also said that one of the benefits of the NBI, including its academic programmes, 'would be the creation of an informal network of individuals in the Nile Basin countries with personal relationships and shared understanding of Nile management issues'.[13] Even in critical times, as at the present juncture, such a network of experts and officials helps keep channels open, even when the differences are great.

While these achievements are significant, they cannot hide the fact that we are currently at a critical stage and all these gains could be lost with a stroke of a pen.[14] The most interesting subsidiary action projects are still being identified and it will take some time for the countries involved to pass the real test of their commitment to professed joint development. If one evaluates the strength of a cooperative arrangement by its durability, NBI's achievements might not be sufficiently well grounded to serve as a basis for a permanent river basin organisation.[15] This could be considered a harsh condemnation of the investment by the members of NBI and development partners and the hard work put into the design and implementation of projects by so many experts. At this critical point in its history, it is time to reflect on the obstacles that prevent the NBI from becoming a permanent organisation.

IMPEDIMENTS TO SUSTAINED COOPERATION

The current differences over the CFA are probably the most intractable obstacles to sustained cooperation in the NRB. Ironically, the current text of the agreement is the greatest achievement of the NBI but at the same time it is probably its most difficult impediment to cooperation – if the remaining difference over the validity of 'the existing agreements' is not resolved. This difference has been there for a very long time – as long as colonial powers had devised ways to control the source of the Nile.[16]

The upper riparian states are determined that the new CFA should replace whatever 'agreements' existed before.[17] The downstream countries insist that these so-called existing agreements should co-exist with the new treaty. Their position has hardened recently as they are now calling for what are termed 'historical rights' to be imbedded in the agreement.

For the upper riparian states, this is a proposal that is tantamount to an insult. They have made it clear that they reject any reopening of agreed provisions that are the result of a long negotiation process. The upper riparian states have now resolved to sign the agreement and wait for the two downstream states to join later.[18] In signing the CFA, they decided to resolve – within six months of the establishment of the NRBC – the question of existing agreements, currently phrased as a 'water security' issue under Article 14 (b) of the CFA.

Currently, the seven countries have agreed on a six-month period to consider the way forward. In fact, we are now in the middle of the six-month reflection period, hoping that some sort of compromise might be achieved. However, indications thus far do not promote optimism because age-old differences are resurfacing in a forceful manner. Nevertheless, every opportunity should be exhausted in order to try to reach an agreement. In any event, it is hoped that whatever is decided at the end of this period will not foreclose future cooperation among the riparian countries.

At the moment, public rhetoric over the divergent positions of upper and lower riparian states has raised strong public interest, mixed with some level of excitement owing to sensational media reports. This makes it even harder to reach a compromise.

Win-win outcomes necessarily require a two-way movement. That does not seem to exist at the moment as one side already believes that it has moved as far as it can. Continued impasse in the negotiation over the CFA has the danger of encouraging unilateral action by the riparian states and further entrenching current differences and competition to create facts on the ground.[19]

Other impediments to sustained cooperation over the Nile relate to the role of third parties and the natural characteristics of the basin itself. With regard to third parties, the development partners have played a crucial role in providing financial and technical support to all aspects of the NBI. At this critical stage, riparian countries have a clear understanding of the kind of support they want with regard to the CFA.

As to natural impediments of the basin, one writer has identified low effective run-off, recurring drought, population growth, economic growth, growing water demands, current water use practices, practices of financing international organisations and agreements that are divisive and not binding on all riparian countries.[20] Related to these factors is the impact of climate change on cooperation on the Nile Basin, where countries suffering from drought and famine are bound to use all available water resources, including transboundary waters, to address these challenges. This could result in more competition for resources, fuelled by a fast-growing population, food insecurity[21] and energy needs and the resultant increased water needs of the region. It is therefore imperative that countries sharing water resources coordinate their actions in a collaborative manner. Such integrated policies would also help play a critical role in taking measures aimed at lessening the impact of climate change, including environmental, industrial and other economic policies.

ROLE OF GOVERNMENTS AND NON-GOVERNMENTAL ORGANISATIONS IN JOINT MANAGEMENT IN THE NILE BASIN INITIATIVE

Governments

Governmental and non-governmental actors have different parts to play in joint management of transboundary waters. The most obvious role of governmental agencies encompasses policy formulation, political leadership and the necessary institutional setup. These agencies have the responsibility of ensuring that transboundary water issues are imbedded in the national water resource policies of their own states and of enabling synchronisation of national efforts with basin-wide policies.

Government bodies also have the responsibility to provide accurate information to their public and to organise consultations for this purpose. They are of course accountable to their legislatures. In a situation of water scarcity, authorities have a responsibility to address the immediate needs of their populations and to ensure that national policies take into account water availability and the rights of other riparian states. These include agricultural policies of efficient water use that help maintain optimal utilisation of water and avoiding wasteful practices.

In Ethiopia, the Ministry of Water Resources has the overall mandate over the development and management of water resources of the country, including determining the conditions for the optimum allocation and utilisation of water resources within the country and signing international agreements relating to transboundary rivers.[22]

The ministry implements Ethiopia's Water Resources Management Policy, which incorporates fostering regional cooperation on transboundary waters, based on the principle of equitable and reasonable utilisation.[23] The Ethiopian Water Sector Strategy also gives particular attention to ascertaining Ethiopia's entitlement and use of transboundary waters and promoting fair regional cooperation.[24]

The Plan for Accelerated and Sustained Development to End Poverty (PASDEP), as the guiding national strategic framework for Ethiopia, incorporates water resources, water supply, and sanitation, and specifically stipulates that:

> A recent model is the Nile Basin Initiative, under which considerable movement is expected during the PASDEP period in terms of: (i) implementation of a watershed development program, (ii) implementation of irrigation and drainage projects, and (iii) putting in place flood preparedness and early warning systems around Lake Tana.[25]

Non-governmental organisations

Non-governmental actors have an important role to play with regard to the joint management of shared water resources. Foremost among these activities is the creation of awareness of environmental protection tools and instruments. The outcomes of consultations organised by non-state actors or with their involvement normally filter into or contribute to public policies. Constructive discussions among non-state actors such as academic institutions and think-tanks across the riparian states help to narrow the gap at policy level negotiations.

Conversely, these actors could contribute to worsening tension where negotiations are difficult among public actors. This is evident among media professionals, who could exacerbate an already tense situation, particularly in periods of water scarcity. Government bodies should do their part by providing media professionals with up-to-date and accurate information in producing fact-based reports.

PRINCIPLE OF EQUITABLE AND REASONABLE UTILISATION

The principle of equitable and reasonable utilisation of transboundary rivers is widely accepted among nations as the starting point for any cooperative arrangement over transboundary rivers.[26] In the context of the Nile, it has special meaning because the riparian states have enshrined this cardinal principle in the CFA with the expectation that it will ultimately help rectify the inequity in the basin and lay the basis for effective cooperation.

Ethiopia's position[27] has evolved from mere declaration to determination to reassert and reserve the right to take all measures in respect of the Nile. Whatever has been done by way of allocation of the water resources without its participation cannot affect its entitlements[28] to use the water.

While the downstream countries also claim to endorse the principle of equitable utilisation, they still maintain antiquated notions such as 'historical rights', directly negating any concept of equity. The CFA has included factors that will help determine what is equitable and reasonable in each case. To maintain the necessary balance between the upstream and downstream countries, the agreement contains the obligation not to cause significant harm. Having said this,

> ... it is the principle of equitable utilization that ultimately takes priority, with downstream harm being merely one factor to be considered in the determination of what is equitable and reasonable.'[29]

The principle of equitable and reasonable utilisation is a cornerstone of the CFA. Its effective implementation could assist the riparian countries to reach objectives, the broad outlines of which were suggested by Whittington et al, and include 'exploitation of opportunities for joint gains', 'allocation of the long-term yield', 'management of water shortages', and 'establishment of regional water markets'.[30]

All these objectives might not be attained in light of widening differences among the riparian countries. It now appears that some form of ambiguity[31] could have helped the riparian countries to arrive at a workable compromise rather than the legal certainty that has been on the agenda of the negotiation over the legal and institutional framework.

CONSIDERATION OF NON-WATER ISSUES IN THE NILE RIVER COOPERATION

Issues of a bilateral and multilateral nature that are not directly water related and that cover wide-ranging socio-economic, cultural and political ties among riparian states are important to a certain extent in order to reach an agreement over transboundary water management.

It is certainly true that a multifaceted cooperation 'might enhance even more the prospects for stable voluntary cooperation'.[32] But such wide-ranging cooperation is important only if there already is solid understanding on core water issues. If a cooperative arrangement based on a win-win outcome is already in place, other non-water issues could cement the arrangement because countries with stronger socio-economic ties have a better chance at reaching acceptable arrangements than countries whose relations are defined only by a history of mistrust and confrontation.

When the difference among riparian states is great, as is currently true of the Nile River Basin, even nations with longstanding relations find it difficult to mend fences. It all amounts to accommodating vital and competing interests in good faith.

CONCLUSION

Efforts to establish a permanent river basin organisation for the Nile River Basin have reached a critical stage. The riparian states have to decide whether they want to continue with their differences over the CFA, whether they wish to resolve these differences, or whether only the seven upper riparian countries should sign the agreement, with the remaining countries joining later, in the process replacing the NBI with the NRBC. Another option would be to extend the NBI transitional arrangement for a while and to resume the negotiations in the future, starting from the current stage.

Failure carries with it dangers. It might encourage unilateral measures and thereby erode the chances of a future agreement. Worse, it might result in more water scarcity and environmental degradation. The end result could be a lost opportunity for the basin. The most sensible and lasting solution is water allocation[33] in the context of basin-wide cooperative arrangements. It has been rightly asserted that 'clinging to mutually exclusive doctrines can only be maintained as a zero-sum game', which can hardly be sustainable. The same author emphasises that, 'It would be impossible to imagine that the upstream and downstream countries will be able to entertain the stalemate in the 21st century.'[34] Even though this was said some time ago, it holds true for the current realities of the basin.

Various basins have tried different modes of cooperative management and development. The NBI Institutional Strengthening Project has been considering some of these alternative models of cooperative management for adaptation to the future NRBC. Whatever model is chosen, it will be sustainable only if it meets the requirements of equity to all riparian countries.

Such a model should obviously have to address joint protection of the environment in an integrated manner to assist in the sustainability of the basin.

Finally, it has been said that 'inclusiveness and transparency of process are the hallmarks of the recent Nile Basin Initiative.'[35] This assertion, made in earlier years of the NBI, is being put to a severe test.

NOTES

1 The opinions expressed in this piece do not necessarily reflect the views of the Ministry of Foreign Affairs of the Federal Democratic Republic of Ethiopia.

2 Fatima Farag, Sharing a lifeline, *Al-Ahram Weekly,* 10–16 August 2000, discussing the need to increase the Nile water quota, said that 'The tension that could result from this situation was vividly illustrated in 1977 when then Ethiopian President Mengistu Haile Mariam claimed the right to unilateral decisions on the utilization of Nile water. The President Anwar El-Sadat declared firmly that any such action would be considered a reason for war.' Another sample is Anthony Mitchell's piece entitled 'Africa could face water wars' for AP, 10 September 2003 or Nimrod Raphaeli's 'Rising tension over the Nile River Basin', for Middle East Media Research Institute, 27 February 2004.

3 Volker Boge and Lars Wirkus, 2006, Current state and experiences in transboundary water management in Africa, Bonn International Centre for Conversion.

4 Kristin Wiebe, The Nile River: Potential for conflict and cooperation in the face of water degradation, 41 *Natural Resources Journal*, 2001, 743.

5 Kefyalew Achamyeleh, The problems and prospects for inter-country cooperation for integrated water resources development water resources development of the Nile River Basin, United Nations Economic Commission for Africa, 1995, 3.

6 See Yehenew Tsegaye Walilegne, The Nile Basin: From confrontation to cooperation, 27 *Dalhousie Law Journal* 503 (Fall 2004), 3, for discussion of downstream positions

7 Jutta Brunneé and Stephen J Toope, The changing Nile Basin regime: Does law matter?, *Harvard International Law Journal* 43(1)(Winter 2002), 143–144.

8 Press and Audiovisual Department, Ministry of Information, The Foreign Affairs and National Security Policy and Strategy of the Federal Democratic Republic of Ethiopia, November 2002, 111–128, available at http://www.mfa.gov.et/Foreign_Policy_And_Relation/Foreign_Policy_And_Relation.php, accessed 23 December 2009.

9 Nile Basin Initiative, http://www.nilebasin.org/, accessed 23 December 2009.

10 Heather L Beach, Jesse Hammer, J Joseph Hewitt et al, *Transboundary freshwater dispute resolution: Theory, practice, and annotated references,* Tokyo, New York, Paris: United Nations University Press, 2000, 9 (on the nature of general principles of international water law).

11 See Jonathan Lautze and Mark Giordano, Transboundary water law in Africa: Development, nature, and geography,45 *Natural Resources Journal* 1053 (Fall 2005), 8, where it is said that 'while ascertaining the current legal status of international water agreements is difficult, to say the least, it is probably safe to assume that a large number of the substantive agreements were never implemented in practice or are no longer in force'.

12 Nile Basin Organisation, Confidence Building and Stakeholder Involvement Project, available at http://cbsi.nilebasin.org/, accessed 23 December 2009.

13 Dale Whittington, John Waterbury and Elizabeth McClelland, Toward a new Nile Waters agreement, *in Water quantity/quality management and conflict resolution,* edited by Ariel Dinar and Edna Tusak Loehman, Santa Barbara, Calif: Greenwood Press, 1995, 177.

14 Recent decision by the seven upper riparians resolving to sign the CFA pending the sub-article on 'existing agreements' masked as a 'water security' issue to be resolved after the establishment of the Nile River Basin Commission.

15 Ruth Vollmer, Reza Ardakanian, Matt Hare et al, Institutional capacity development in transboundary water management, UN Water Decade Programme on Capacity Development (UNW-DPC), United Nations World Water Assessment Programme, Insights, UNESCO, 2009. Some elements that could help evaluate effectiveness of basin-wide cooperation are discussed.

16 M El-Fadel, Y El-Sayegh, K El-Fadl, and D Khorbortly, The Nile River Basin: A case study in surface water conflict resolution, *Journal of Natural Resources, Life Science Education* 32 (2003), 107.

17 The relevant article on this matter is now couched in a new concept of 'water security', which has brought the negotiation back to the validity of so-called existing agreements.

18 See A week in the Horn, available at http://www.mfa.gov.et/Press_Section/Week_Horn_Africa_May_29_2009.htm, accessed 23 December 2009, for details of the decision and positions expressed.

19 Brunneé and Toope, The changing Nile Basin regime, 147.

20 Kefyalew Achamyeleh, The problems and prospects for inter-country cooperation, 42–47.

21 Ibid, 22.

22 Ministry of Water Resources of Ethiopia, available at http://www.mowr.gov.et/, accessed 23 December 2009.

23 The Ministry of Water Resources of Ethiopia, Ethiopian Water Resources Management Policy, 1999.

24 The Ministry of Water Resources of Ethiopia, Ethiopian Water Sector Strategy, November 2001.

25 Ministry of Finance and Economic Development (MoFED) of Ethiopia, *Ethiopia: Building progress-plan for accelerated and sustained development to end poverty* (PASDEP) (2005/06–2009/10), volume I, main text, September 2006, Addis Ababa, Ethiopia, 127.

26 Patricia Birnie and Alan Boyle, *International law and the environment*, 2nd edition, USA: Oxford University Press, 2002, 302. See also A Dan Tarlock, who asserts that 'Modern international water law is built upon the assumption that all states whose territories contribute to an international drainage basin have a right to an equitable share of the waters of the basin. The doctrine of equitable utilization or equitable participation is designated as a rule of customary international law', in How well can international water allocation regimes adapt to global climate change?, *15 Journal of Land Use and Environmental Law* 423 (Summer 2000 supplement), 5.

27 Albert H Garretson, in his early article, The Nile River system, *American Society of International Law Proceedings,* 1960, 143, understands Ethiopia's position as being based on the premise that 'natural rights to the waters in her territory are undeniable and unquestionable'.

28 Communications of the position of the government of Ethiopia as quoted in Fisseha Yimer, State succession and the legal status of international rivers, in *The legal regime of international rivers and lakes*, edited by Ralph Zacklin and Lucius Caflisch, The Hague/Boston/London: Martinus Nijhoff, 1981, 189.

29 Brunneé and Toope, The changing Nile Basin regime, 149. Charles B Bourne, The primacy of the principle of equitable utilization in the 1997 Watercourses Convention, 35 *Canadian Year Book of International Law* (1997), 230.

30 Whittington et al, Toward a new Nile Waters agreement, 168–177.

31 John Waterbury, Legal and institutional arrangements for managing water resources in the Nile Basin, *Water Resources Development* 3(2) (1987), 96.

32 Whittington et al, Toward a new Nile Waters agreement, 174.

33 Ibid, 170–171.

34 Yacob Arsano, The Nile Basin: Upstream perspectives of cooperation in the new millennium, paper presented at the 8th Nile 2000 Conference, 26–30 June 2000. See also Joseph W Dellapenna, who rightly states that 'only by reworking the Nile

regime into a coordinated regional management authority can the basin's problems possibly be solved', in Treaties as instruments for managing internationally shared water resources: Restricted sovereignty vs community of property, 26 *Case Western Reserve Journal of International Law* 27, 9.

35 Brunneé and Toope, The changing Nile Basin regime, 156.

Role of government in preventing climate change-induced water resource conflicts

An Ethiopian perspective[1]

Teferra Beyene
Head, Transboundary Rivers Department, Ethiopian Ministry of Water Resources, Addis Ababa, Ethiopia

Fekahmed Negash
Head, Basin Development Studies and Water Utilization Control Department, Ministry of Water Resources, Addis Ababa, Ethiopia.

INTRODUCTION

The direct and indirect impacts of climate change on Africa are generally believed to be severe because of Africa's high dependence on agriculture, direct harvesting of natural resources and limited capacity to adaptation[2] that will eventually lead to intensified poverty and famine. Crop yields will be adversely affected, harvests of natural products will be limited and the frequency of extreme weather events such as flood and drought increased.[3] The direct effect of climate change on the hydrological cycle, which encompasses water availability and water quality, as well as water service provisions, poses serious challenges for water resources management. A particular challenge for water resources management is connected to the fact that many river basins and groundwater systems in Africa are transboundary, that is, shared by two or more countries.[4]

Water resources are under pressure from increasing demand owing, among others, to population increase, economic growth and development and increasing urbanisation. Climate change compounds this pressure as it bears directly on the hydrological cycle, which in turn affects water availability and quality.[5] The combined pressure from increasing demand for more water and from climate change is expected to lead to severe scarcity. Because water is at the nexus of diverse social and economic activities, its scarcity will affect societies in multiple adverse ways leading to tensions and instability in water-scarce regions, if proactive conflict prevention measures are not put in place.[6]

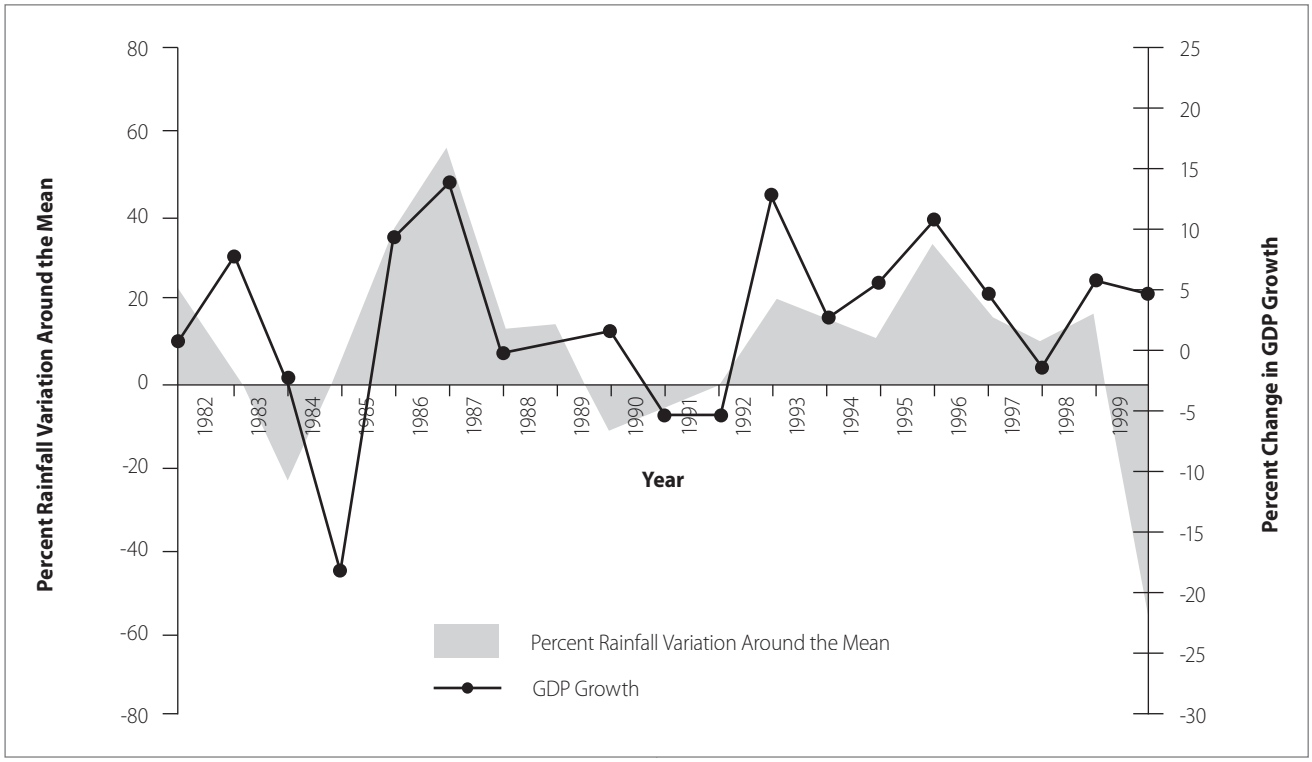
The direct and indirect impact of climate change on Africa is generally believed to be severe because of Africa's high dependence on agriculture, on direct harvesting of natural resources and limited capacity to adaptation that will eventually lead to intensified poverty and famine. Further, climate change impacts in Africa will be made more complex because most of its rivers and ground water systems are transboundary. This is all the more so in the Nile Basin, where six of the ten riparian countries are the poorest in the world, both in terms of GDP and HDI indicators, and where the river is shared among ten countries.

The variability witnessed across the Nile Basin will result in climate change affecting some countries more adversely than others, and in different ways. The runoff potential of the Nile Basin, compared to other basins, is very low. Nile flow is characterised by high spatial and temporal variability. Development and utilisation of the Nile water resources is highly asymmetric, with the upper eight riparian countries barely developing or utilising any. Added to this, climate change poses new, complex risks for the economies of Nile riparians. The warming of the earth's atmosphere will increase evaporation rates and crop water requirement, changing precipitation rates and reducing agricultural yields. The impact of hydrologic variability on poor traditional subsistence economies is enormous. In a study conducted by the World Bank[7] rainfall variability in Ethiopia closely correlates with changes in the GDP, which is a clear indication of how the economy of the country is vulnerable to climate change. Figure 1 illustrates this.

Climate change, hence, will pose serious challenges for water resources management, at both national and regional, that is, basin-wide levels. A particular challenge arises because many river basins and groundwater systems in the Nile Basin are transboundary.

Security analysts and academics have warned for some time now that climate change threatens water and food

Figure 1 Rainfall variability around the mean and recent changes in GDP growth for Ethiopia



Source World Bank

security, and the allocation of resources, threats which in turn could increase forced migration, raise tensions and trigger conflict. Increasing water scarcity and depletion of its quality, partly as a consequence of climate change, unless pre-empted, will probably lead to an increase in water conflicts and tensions among countries that share transboundary waters.

For Ethiopia, adaptation to climate change in a transboundary context implies, among others, supporting the establishment of transboundary cooperative mechanisms and institutions where they have not already been established, and, where they have been established, working towards their strengthening in the technical-knowledge and management, legal and institutional and financial domains. For example, this may include contributing to the enhancement of forecasting and modelling capacities, data generation and information management systems, decision-support systems, etc, of the Nile Basin Initiative (NBI) and its sub-basin organisations.

CONFLICTS TRIGGERED BY CLIMATE CHANGE

Increasing temperatures as a result of climate change, precipitation anomalies and extreme weather conditions will aggravate processes of resource degradation that are already under way, especially land degradation, deforestation, freshwater deterioration and fishery resource depletion, potentially leading to increased risks of violent conflict over scarce resources inside and across national borders. Such conditions will force millions of people to migrate, leading to higher pressures on resources in areas of destination and subsequently to resource competition and possibly political instability and violent conflict.[8] Although climate change is usually regarded as a possible future threat, some argue that it has already contributed to ongoing conflicts in Africa.

Transboundary strategy: Nile Basin Cooperation – a necessity, not a choice

The combined effects of climate change will present the riparians with unprecedented management challenges that can be addressed only through cooperative actions. It is from recognition of this that, since it joined other riparians for the first time in 1999 to form the NBI, Ethiopia has been at the forefront of promoting Nile Basin cooperation. For example, the Boundary and Transboundary Rivers Affairs Department, in the Ministry of Water Resources, is dedicated to promoting inter-riparian cooperation. Further, Ethiopia promotes cooperation sub-regionally in the NBI through taking active part in and supporting the Eastern Nile Subsidiary Action Programme (ENSAP) for example by providing headquarters in Addis Ababa, and granting diplomatic status and a headquarters agreement to the Eastern Nile Technical Regional Office (ENTRO) to facilitate smooth operation. This is in addition to regular financial contributions to the

NBI Secretariat and ENTRO. Ethiopia's position is that there is no alternative to cooperation, if the multifaceted worst impacts of climate change are to be mitigated and averted. Climate change in a way is more – not less - reason for accelerating cooperation on the Nile. That said, though, certain challenges impede the realisation of the potential for cooperation.

Lack of an adequate common or shared knowledge base: Although huge amounts of data and information have been gathered through ENSAP, the systematic processing of the data to generate essential knowledge to understand the system at basin level and holistically, to assess the potentials and constraints the resource base offers is at an early stage. This is because of the current project-by-project approach. Such essential knowledge pertains, for instance, to understanding the extent to which development upstream impacts existing uses in downstream parts. Because of the inadequacy of the shared knowledge base, misconceptions prevail that upstream development would adversely harm the lower riparians. As a result, the lower riparians are uncertain about the potential benefits of water resources development their upstream co-riparians plan to undertake.

Lack of sufficient trust: The high level of dependency on the shared water resource in the lower parts of the Nile Basin poses a challenge to the full exploitation of the development potential in the upstream parts. Partly owing to limitations of data and information availability and processing, but also in part owing to the low level of trust, the development of the untapped potential upstream is often perceived as a threat to the water supply reliability of lower riparians. Such perceptions exist although some studies indicate that upstream regulation works would benefit both upstream and downstream riparians hugely.[9] Examples of such benefits include increased water supply reliability, reduced losses owing to evaporation, increased flood damage mitigation and decreased reservoir sedimentation

Lack of a legal and institutional framework: The Nile riparians are currently in a critical phase with respect to concluding a permanent legal and institutional framework, the Cooperative Framework Agreement (CFA). The CFA embodies a host of principles that would greatly contribute to the sustainable development, management and protection of the shared Nile water resources and its environment. However, mainly because of the historical legacy of the Nile, the CFA has not yet been finalised, but it is hoped that will happen in the not-too-distant future.

Despite these constraints there seem to be growing recognition that cooperation among co-riparians is not a choice but a necessity to promote regional growth and reduce vulnerability to adverse impacts of climate change, which would affect all riparian countries.

INTRA-NATIONAL STRATEGIES

Within Ethiopia the government has adopted several measures that would support adaptation to climate change. To ensure sustainable development and management of the water resources of the country, its water sector has gone through various reform measures, which include the development and adoption of the Integrated Ethiopian Water Resource Management Policy;[10] the Water Sector Strategy[11] to translate the policy into action; and the Fifteen Year Water Sector Development Programme,[12] in which various investment programmes and projects are outlined. The government has also enacted the required legislation including the establishment of basin authorities[13] to pursue sustainable development and management of the country's water resources. The overall policy objective is to enhance and promote national efforts towards the efficient, equitable and optimum utilisation of the water resources of Ethiopia for significant socio-economic development on a sustainable basis. Further, the Water Policy, Sector Strategy and the Development Programme promote transboundary cooperation, including joint development and management of the shared resource.[14]

From another vantage point, it is evident that adaptation to climate change will be a coordinated government–private-sector–civil society response. The role of the private sector concentrates mainly on changes in the sectoral structure of production, and in cropping patterns. The role of government is primarily to create an enabling environment for effective mitigation and adaptation measures such as developing appropriate policy and legal systems, capacitating and empowering institutions, providing the necessary information, incentives, and economic environment to facilitate such changes. The role of civil society will be to support adoption of adaptation measures; disseminate information and mobilise local resources.

Climate change is likely to influence the food producing capacity in many areas in Ethiopia, resulting in reduction in crop yields.[15] Climate change will possibly adversely impact fresh water availability in many water-stressed communities caused by decreases in stream flow and groundwater recharge. Increased flooding caused by climate change is expected to contribute to migration from riverine settlements leading to exodus of environmental refugees,[16] resulting in severe resource competition and conflicts first in destination areas in Ethiopia, and eventually across borders. Unsustainable, high population growth rates will result in demographic stress. All this, coupled with limited institutional capacity to mediate and manage conflicts, will engender polarisation across communities. Unless proactive mitigation and adaptation strategies to climate change are put in place, conflict

prevention (both intra-nationally in Ethiopia and regionally in the Nile Basin) will not be effective. The government has taken this into account and has devised multiple strategies to mitigate the impact of climate change. These pertain to water sector policies, energy policies, food security policies and disaster preparedness policies, among others. The focus here is on the water sector.

APPROACH TO ADAPTATION TO CLIMATE CHANGE IMPACTS AND CONFLICT PREVENTION

Adaptation in the context of climate change consists of actions taken in response to, or in anticipation of, projected or actual changes in climate with the objective of moderating harm, coping with consequences or exploiting beneficial opportunities.[17] The term refers to any adjustment, whether passive, reactive or anticipatory, that can respond to anticipated or actual consequences associated with climate change. Reactive adaptation means responding to climate change after it occurs, while anticipatory adaptation means taking steps in advance of climate change to minimise potentially negative effects.[18] This is a better approach, though very demanding.

Implementing watershed management and associated measures

Holistic watershed management with the focus on sustainable livelihood is one of the cornerstones of government policy. Hotspot catchments critical to the sustainable management of river systems and basins have been identified for intervention. Some can be implemented by the government alone, and others will be addressed in cooperation with the neighbouring riparian countries of Sudan and Egypt, for example through the NBI and ENSAP. The promotion of alternative energy sources, the prevention of deforestation and environmental degradation, and afforestation are critical components of adaptation to climate change through watershed management.

Improving water sector governance

Governance describes the process of decision making through which decisions are implemented.[19] Taking into consideration the critical impact of climate change on the nation as a whole, improving the governance system including empowerment and involvement of local communities and civil society, along with open, transparent, and accountable policy and decision-making processes, will have a critical bearing on the way policies and institutions respond to the impact of climate change as they affect the poor and the most vulnerable.

Making climate change a public issue

Climate change will affect large parts of society and every sector of the economy, with its greatest impact on those who are more dependent on natural resources. The effect of climate change is directly related to the livelihood and wellbeing with consequences for poverty levels, vulnerability, conflict and national insecurity. The success of any mitigation and adaptation measures will depend on clear understanding, preparedness, acceptance and conviction of the community about the effect of climate change. For this full involvement of all stakeholders is a necessity. Hence, awareness creation, planning and implementation of appropriate measures are important considerations. Toward this end, climate change will be made a public agenda[20] with the government facilitating discussions and debates on the issue, conducting a media campaign with the objective of preparing the community for adaptation to climate change, including the prevention of possible climate change-induced conflicts in and outside Ethiopia.

FACILITATION OF DEVELOPMENT AND MINIMISATION OF RISK

This government role entails mainly supporting research and information dissemination on climate change risks and possible adaptation options. The approach also focuses on building adaptive capacity among various communities and stakeholders so they can develop their own responses, on their own terms, with support and guidance from the government.

Climate change and development planning

Water is a crosscutting input into almost all sorts of economic activity. Climate change as it affects water availability will have cross-sectoral impact. Formulation and implementation of the country's policies, strategies and plans for economic, social and overall development matters will put climate change at the centre of decision making. The government will play the lead role in integrating and coordinating sectoral policies – at national and sub-national levels – that address issues of climate change. Strengthening national research capacity and overall capacity building as related to climate change is also under consideration.

Financing climate-change-related intervention

The amount of finance that is required for interventions related to climate change is immense.[21] Large amounts of

finance are needed for research into the various aspects of climate change, for capacity building, information collection, processing and dissemination, public awareness and involvement and other interventions related to mitigation and adaptation measures. Though the resources for those interventions can come from the private sector and the international community, the government of each nation is expected to play a major role.

INTERNATIONAL NEGOTIATION OVER CLIMATE CHANGE

Africa contributes little to the greenhouse gas emissions blamed for global warming, but the continent is likely to be hit hardest by climate change impacts: droughts, floods, heat waves and rising sea levels.[22] Africa's development aspirations are at stake unless urgent steps are taken to address the problems of climate change. It is fundamentally affecting productivity, increasing the prevalence of disease and poverty – and triggering conflict and war. The rich industrialised countries, responsible for the largest emissions of greenhouse gases that result in global warming and climate change, have shown willingness to negotiate with the rest of the world over responding to climate change, including adaptation and mitigation strategies and associated cost/burden sharing. Ethiopia, along with the other African countries, strives to take part in the negotiations to secure advantageous terms.

CONCLUSION

Climate change will have multi-faceted, multi-sectoral adverse impacts. These will be felt more in the water sector, a sector that lubricates all life and social and economic activities. The Nile Basin stands to be most affected, given its fragile nature and its location in the most arid parts of the continent. Among the many consequences of climate change will be the likelihood of social- (for example migration), resource- (for example competition over water, grazing land), and security-related conflicts (for example when water is perceived more as a national security and less as a shared resource issue), within and among nations. Ethiopia believes that the threat of such conflicts can be averted only through regional cooperation. To this end, it is working hard to promote cooperation through the NBI and ENSAP regionally and nationally through formulation of climate change adaptation strategies.

NOTES

1 Disclaimer: This paper reflects the authors' opinions and does not represent Ethiopian government policy.

2 Paul Collier, Gordon Conway, Tony Venable, Climate change and Africa, *Oxford Review of Economic Policy,* Oxford: University of Oxford 2009.

3 African Development Bank (AfDB) et al, *Poverty and climate change: Reducing the vulnerability of the poor through adaptation,* Cambridge: Cambridge University Press, 2002.

4 WWC, Adapting to climate change in transboundary water management, Switzerland, 2009, available at http://www.water-council.org/fileadmin/wwc/Library/Publications_and_reports/Climate_Change/PersPap_15._Water_Resources_and_Services.pdf, accessed July 2009.

5 IPCC: Impacts, adaptation and vulnerability, Intergovernmental Panel on Climate Change, 1994, 2007, available at http://books.google.com/books?hl=en&lr=&id=TNo-SeGpn7wC&oi=fnd&pg=PA81&dq=IPCC:+Impacts,+adaptation+and+vulnerability,+Intergovernmental+Panel+on+Climate+Change,+1994,+2007&ots=vN8CteWsoC&sig=jE938qoz6LfujHzBXIZGXpNXDok, accessed June 2009.

6 P Ashton, Southern African water conflicts: Are they inevitable or are they preventable?, in Green Cross International (ed), *Water for peace in the Middle East and Southern Africa*, Geneva, Switzerland: Green Cross International, 2000.

7 World Bank, Country Water Resources Assistance Strategy for Ethiopia, 2006, available at http://www.google.com/search?q=World+Bank,+Country+Water+Resources+Assistance+Strategy+for+Ethiopia,+2006.&hl=en&sa=G&tbs=bks:1&tbo=u&ei=1TGeS5zIEYOEmgP98fCeCw&oi=book_group&ct=title&cad=bottom-3results&resnum=11&ved=0CDIQsAMwCg, accessed August 2009.

8 Clionadh Raleigh and Henrik Urdal, *Climate change, environmental degradation and armed conflict*, University of Colorado at Boulder and International Peace Research Institute, Oslo, 2006.

9 Blackmore and Whittington, Exploring opportunities for cooperative water resources development on the Eastern Nile.

10 The Ministry of Water Resources issued the Ethiopian Water Resources Management Policy in 1999.

11 Ethiopian Water Sector Strategy, Ministry of Water Resources, November 2001, available at http://www.wateraid.org/documents/plugin_documents/ethiopia_watersectorreview.pdf, accessed August 2009.

12 Water Sector Development Programme 2002–2016, Ministry of Water Resources, November 2001, available at http://www.fao.org/nr/water/aquastat/countries/ethiopia/index.stm, accessed September 2009.

13 River Basin Councils and Authorities Proclamation, No534/2007, 23 July 2007, available at http://www.eah.org.et/docs/RBO%20Proclamatio.pdf, accessed September 2009.

14 Ministry of Water Resources, Ethiopian Water Resources Management Policy Article 2.2.8, 1999, 15.

15 AfDB et al, Poverty and climate change.

16 IPCC, Impacts, adaptation and vulnerability, Intergovernmental Panel on Climate Change, Cambridge: Cambridge University Press, 2001.

17 Oli Brown, Anne Hammill and Robert McLeman, Climate change as a 'new' security threat: Implication for Africa, Royal

Institute of International Affairs, Chatham House, London, 2007.

18 IPCC, Impacts, adaptation and vulnerability.

19 Learning for sustainability (LfS), available at http://learningfor-sustainability.net/, accessed 12 January 2010.

20 Sakhile Koketso, Common but differentiated responsibilities: South Africa's role in climate change, Heinrich Böll Foundation, South Africa, 2007, available at http://www.klima-der-gerechtigkeit.de/.../hbf_south_africa_climate_dossier.pdf, accessed 12 January 2010.

21 UNEP, Adaptation and vulnerability to climate change: The role of the finance sector, UNEP Finance Initiative, 2006, available at http://66.102.9.132/search?q=cache:30jTG3LjLwIJ:www.unepfi.org/fileadmin/events/2006/nairobi/sandhoevel.pdf+UNEP,+Adaptation+and+vulnerability+to+climate+change:+The+role+of+the+finance+sector,+UNEP+Finance+Initiative,+2006.&cd=1&hl=en&ct=clnk, accessed 12 January 2010.

22 IPCC, Climate Change 2007, Synthesis Report Contribution of Working Group I, II and III to the Fourth Assessment, Report of the Inter-governmental Panel on Climate Change, IPCC, Geneva, Switzerland, 2007.

The role and experiences of Egypt in managing transboundary water conflicts

Ambassador Marawan Badr
Office of the Minister of International Cooperation, Egypt

INTRODUCTION

Where water is concerned, Egypt is in a precarious situation, although, over time, water has rendered it a unique and invaluable experience. We need only recall a few geopolitical facts that have shaped Egypt's history, culture and politics. Egypt relies on a single resource of water for most of its domestic, agricultural and industrial needs. Over 95 per cent of the fresh water available in Egypt comes from the River Nile. The importance of the Nile River to Egypt cannot be overstated; nor is it a coincidence that Egyptians have revered the Nile.

This single source of water has many characteristics, the most important of which is its being a transboundary river. This river goes through ten riparian countries. Egypt's unique situation of relying on a single source of water whose sources lie well beyond Egyptian boundaries have made it a necessity and not an option to develop an articulate water management policy for this great river. Concern with the Nile waters is not merely a matter of national security, but an issue of national survival.

These facts have dictated Egypt's three-pronged water strategy. The first concern involves ensuring the natural flow of the Nile water to Egypt. Second, Egypt deems it necessary to develop a regional policy towards its southern neighbours, taking into account that of all 10 basin countries, Egypt stands alone as a downstream country. It aims at promoting cooperation between riparian countries to optimise the use of resources and cater for the needs of all on a win-win situation basis. The third and final strategy is the purposeful and optimal utilisation of its water resources.

THE LEGAL REGIME GOVERNING THE NILE WATER

Egypt has been receiving and harnessing Nile waters from time immemorial, allowing it to build one of the world's oldest civilisations, the pillar of which was irrigated agriculture. Meantime, the upstream riparian states were engaged in pastoral activities and subsistence rain-fed agriculture, and so Egypt acquired natural and historical rights over the Nile waters reaching it.

In no way does this undermine Egypt's recognition of the right to equitable utilisation of Nile waters by all ten riparian states for their development. In exercising that right, however, the upstream riparian should not cause harm to downstream riparian. In other words, the issue is not one of restriction, but of regulation of the use of water and the need for consultation among Nile Basin countries.

The Nile harbours tremendous potential and innumerable opportunities for socio-economic development if managed in a cooperative and sustainable manner and looked upon as a single hydrologic unit. Conscious that the issue of co-managing Nile water is vital, Egypt has traditionally played a leading role in developing regional and organisational frameworks for cooperation in the Nile Basin region.

The agreements concluded at the turn of the twentieth century between the UK on behalf of Egypt and Sudan, on the one hand, and Belgium, Italy and Ethiopia on the other hand contain the obligation of prior consultation between upstream and downstream countries before upstream states embark on works on the Nile that may affect the flow of waters downstream. The UK made a similar commitment on behalf of its East African colonies (Kenya, Tanganyika and Uganda) in 1929. This seems only

natural because while upstream projects could affect and harm downstream countries, the opposite is not true.

Regrettably, these agreements have been subject to controversy. The upstream riparians allege that these are colonial agreements concluded under coercion and that the colonial power had no right to make such commitments; that they have become null and void from the date of independence; and, were they to remain valid, they must be reviewed to take into consideration recent developments of climate change, the repeated cycles of drought and famine, population explosion and the need to achieve food security; and they serve only to maintain the status quo and Egypt's exaggerated water share to the detriment of the upstream riparian.

International law and convention attest otherwise. Even though these agreements were concluded a century ago, they remain in line with the provisions of the most recent international instruments. Article 12 of the 1978 Vienna Convention on the Succession of States stipulates that:

- A succession of state does not as such affect obligation relating to the use of any territory or to restrictions upon its use, established by treaty for the benefit of any territory of a foreign state and considered as attaching to the territories in question.
- Rights established by treaty for the benefit of any territories and relating to the use of a foreign state and considered as attracting to the territories in question.[1]
- Furthermore the United Nations Convention on the Non-Navigational Uses of International Rivers emphasises the rules of prior notification and no appreciable harm befalling other riparian states.

It is therefore Egypt's considered opinion that the existing legal regime governing the Nile does indeed faithfully reflect the rules and principles of general international law and long-standing regional custom. Consequently, Egypt's acquired natural and historical rights are to be respected and the principle of harm prevention should be observed.

BILATERAL COOPERATION BETWEEN EGYPT AND OTHER RIPARIANS

The question is whether the legal regime in place has prevented agreement between the upstream and downstream countries.

In 1929, Egypt and Sudan agreed to share the waters reaching them, allocating to each 48 billion cubic metres (bcm) and 4 bcm respectively – taking various factors into consideration, inter alia, size of population, development needs, level of dependence on Nile waters and the availability of an alternative resource. The agreement was later updated in 1959, to account for the 22 bmc water savings resulting from the construction of the Aswan High Dam, as well as the increasing water needs of both countries. The additional waters were divided by a ratio of 2 to 1. Thus Egypt's share rose by 15 per cent to 55,5 bcm, while that of Sudan rose by a staggering 450 per cent to 18,5 bcm. Egypt covered the entire cost of the dam (400 million LE (livre égyptienne), in addition to paying Sudan 15 million LE for the resettlement of the Nubians.

Throughout its history Egypt has harnessed the potential of the river to its fullest extent, and this ongoing effort from generation to generation reached its peak in the 1960s with the completion of the High Dam. The benefits that came with this make it very difficult to comprehend the deliberate and concerted campaign against it. There is no way that other riparians could have shared these waters by building a dam further upstream because the present site is the only possible one. While the High Dam could be supplemented by other dams upstream, technically it could not be replaced.

The provisions of the 1959 agreement are often misinterpreted with a view to discrediting Egypt's policies and tarnishing its image. Indeed, Egypt and Sudan committed themselves to the full utilisation of the Nile water, but that undertaking applies solely to the waters reaching them that would otherwise flow to the Mediterranean. It could not possibly apply to the water in the upper reaches of the river, as that would be impossible.

Reference is also made to this agreement with the objective of proving that Egypt is not sincere about the equitable utilisation and water allocation to the upstream riparian which would entail a reduction of Egypt's water, that is, a zero-sum game. This claim fails to differentiate between the waters of the Nile and those reaching Egypt.

Article 5, Paragraph 2, of the agreement covers the understanding reached between Egypt and Sudan on how to respond to claims by other riparians for water shares by deducting the agreed-upon share from their own shares equally. It is not intended to give the two downstream countries any rights regarding water claims by the other upstream riparians.

An agreement was reached between Egypt and Uganda in 1949, allowing for the construction of the Owen Dam, which is used for water storage by Egypt and to generate hydroelectric power by Uganda to satisfy domestic demand and export surplus power to neighbouring Kenya, Tanzania, and, more recently, Rwanda. A further agreement was reached between the two countries in 1991 to increase the capacity of the power station by 50 per cent. These agreements demonstrate the extent to which Egypt is willing to go to reach agreement with the other riparian. These endeavours are all examples of win-win

situations, which have now been on the ground for decades to the satisfaction of the parties concerned.

Unfortunately, however, Egypt's similar attempts to reach agreement with Ethiopia were not as successful. Of course, each party blames the other for this failure. But reviewing Ethiopia's stance, one would find ample evidence of its intransigence and unrealistic preconditions, rendering any meaningful negotiations and their success impossible.

Ethiopia claimed total sovereignty over its waters, disregarding the international status of the Nile, and as a consequence, it retained full right to use waters at will, irrespective of its obligations in accordance with international law and the 1902 agreement between Ethiopia and the UK, which it dismissed as non-binding. It also called for the abrogation of the 1959 agreement between Egypt and Sudan, to which it is not a party, and for the two to drop their acquired natural and historical rights over the Nile waters reaching them.

Ethiopia refused to consider any basin or sub-basin cooperation covering the Nile Basin waters, 1 600 billion cubic meter (bcm) and limited the scope of any negotiation to the 84 bcm reaching Egypt or 5 per cent of the total water, demanding water share from it commensurate with its contribution to the Nile waters and de-linking any water allocation from its supplementary needs and utilisation capacity.

In other words, Ethiopia's primary concern was inflicting harm on Egypt, rather than benefiting from the Nile water. In support of this hypothesis, it is worth noting that Ethiopia's water drive is confined to the Nile, excluding other international rivers flowing to Kenya, Somalia and Djibouti, and to Egypt as the downstream beneficiary of the Nile, except for Sudan. This stance rendered the technical issue of striking a balance between water supply and demand a political matter with grave ramifications.

It was evident that in spite of Ethiopia's alleged need for water, it could afford the luxury of a deadlock and postponement of a water agreement. Ethiopia is often referred to as the 'Fountain of Africa' with 11 river basins apart from the Nile, 500 bcm of rainfall every year and huge amounts of groundwater. Aware of its major contribution to the Nile water in general and up to 85 per cent of the waters reaching Egypt in particular, Ethiopia seemed determined to maximise its political gains, even if that meant compromising the interest of other riparians.

A significant change of attitude, however, surfaced in 1993, whereby a framework agreement of cooperation was signed between Egypt and Ethiopia, placing special emphasis on tackling the water issue. Two expert-level meetings were held in 1993 and 1994 at which both sides agreed on the principles guiding the issue in line with the principles of international law and no harm, equitable utilisation and water allocation.

They also identified several areas of cooperation regarding the development of Nile water resources, including the generation of hydroelectric power. Although the outcome of these two rounds of negotiations was remarkable by any standard, Ethiopia suspended these meetings indefinitely.

It was never clear why it had taken such an action. Did perhaps Egyptian compromises foil Ethiopia's real intentions of tarnishing Egypt's image and discrediting its policies in the context of the bogus political rivalry between the two countries in the Nile Basin and the Horn of Africa? Or was it perhaps constrained by fanatics who perceived reaching an agreement as compromising Ethiopia's national interest, as was the case with allowing Eritrea's cession? Or was it a failure to capitalise on the Egyptian-Sudanese tension at the time?

Even in the absence of an agreement, Egypt responded positively in 1996 to Ethiopia's request to construct a number of dams on the Nile financed by the World Bank. Another request to build additional dams on the Nile financed by the African Development Bank was approved in 2001. Both requests were considered and agreed upon in the framework of the Egyptian-Sudanese 1959 water agreement.

So, Egypt is not objecting to Ethiopia's utilisation of the Nile water or that of any other basin country, for that matter, provided that this does not harm or compromise Egypt.

In this context, one could envisage four types of projects:

- Projects that benefit upstream and downstream riparian states
- Projects that benefit those upstream without causing harm to the downstream riparians
- Projects that benefit upstream riparians, but harm those downstream
- Projects that do not benefit the upstream and harm the downstream riparian

Egypt has no objection to the first two types of projects and would be more than willing to contribute to their implementation. With regard to the third type, although it would be difficult to prevent an upstream riparian from implementing a project to its advantage just to avoid harming those downstream, one would at least expect that the first two types of projects would be exhausted before this third type was embarked on, and to allow ample time for the downstream riparian to contain and minimise the harm such projects might cause them. The

fourth type of project must be avoided at all costs because the mobilisation of resources of upstream countries for the sole purpose of harming the downstream riparian transforms the matter from a technical issue of water to a political issue of grave consequences.

REGIONAL COOPERATION AMONG THE NILE BASIN COUNTRIES

Since the 1960s, there have been several attempts and initiatives to tackle one or more aspects of the water issue on a regional basis with the assistance of the UN specialised agencies and donor countries. The regional approach was supported by the assumption that an international, neutral catalyst would alleviate upstream riparian suspicions of and fears from the 'Big Brother' policies of Egypt. An added advantage was the availability of the technical know-how and funding, and, more importantly, the readiness to provide support not only during negotiations, but throughout the implementation phase as well.

HYDROMAT aimed at gathering the necessary data on the total precipitation in the Nile Basin in order to consider water supply, demand and allocation. Its activities were limited to the Equatorial plateau because Ethiopia denied it access to the Ethiopian plateau, claiming that available data was sufficient for the consideration of water allocation which HYDROMAT would otherwise postpone indefinitely.

Another endeavour, UNDUGU, was meant to promote socio-economic development in areas other than water, with the hope of building confidence through mutual benefit, paving the way for the more problematic issue of water. The United Nations Development Programme (UNDP) prepared a pre-feasibility study, indicating several promising areas of regional cooperation. High on the list was connecting the electric grid of the Inga Dam, in the Democratic Republic of Congo (DRC), to that of the Aswan High Dam, for which a separate pre-feasibility study was prepared and financed by the African Development Bank and Canada.

Regrettably, however, UNDUGU was short-lived as Ethiopia consistently undermined its activities and favoured IGAD as an alternative grouping, of which Egypt is not a member. It accused UNDUGU of diverting attention from the crux issue of water allocation, and attempting to deprive Ethiopia of benefiting from its hydroelectric potential.

UNEP also attempted to carry out a diagnostic study for the sustainable development of the Nile, similar to the studies it had carried out for the Zambezi, Niger and Lake Chad, within the framework of its work programme and the emphasis it attached to fresh waters. Again Ethiopia objected to UNEP's initiative, alleging that it did not cover water allocation, which, by definition, could not possibly fall within UNEP's mandate.

Later, TECCONILE adopted an action plan comprising 22 projects to be implemented over three phases. The D3 project dealt specifically with the establishment of a regional organisation for the development and management of Nile waters and the consideration of its equitable utilisation and allocation. Logic dictated that the implementation of the project would be in the third phase, as a sequence and culmination of the other 21 projects. However, it was advanced to the first phase at Ethiopia's request, in an apparent attempt to appease and accommodate it, yet Ethiopia continued to refuse to join TECCONILE.

THE NILE BASIN INITIATIVE

The Council of Ministers of Water Affairs of the Nile Basin states formally launched the Nile Basin Initiative (NBI) in February 1998, in which all the riparians eventually took part, and for the first time. The NBI provides for an agreed-upon basin-wide framework to fight poverty and promote socioeconomic development of the Nile Basin through equitable utilisation of the benefits of the common Nile Basin water resources.

The Nile riparians seek to realise their shared vision through a strategic action programme comprising basin-wide projects as well as sub-basin joint investment projects. The basin-wide Shared Vision Programme (SVP) is a broad-based programme of collaborative action, exchange of experience and capacity building. A group of experts are working on a comprehensive institutional and legal framework to be agreed upon by the riparians to settle all legal issues.

With regard to the Subsidiary Action Programme (SAP), Egypt, Ethiopia and Sudan agreed in 1999 to establish the Eastern Nile Subsidiary Action Programme Team. This was followed by the Nile Equatorial Lakes Subsidiary Action Program (NELSAP), comprising Kenya, Tanzania, Uganda, Rwanda, Burundi, DRC, Egypt and Sudan. Egypt and Sudan joined the two sub-basin programmes because they get their waters from the two sub-basins. Both Subsidiary Action Programmes have identified joint mutually beneficial investment projects.

To raise donor support for the NBI and its portfolio of cooperative projects, several meetings of the International Consortium for Cooperation on Nile (ICCON) have been held since 2001, at which the donor community pledged its financial support.

While the Nile Basin riparians achieved excellent results with regard to their cooperation within the

framework of the Nile Basin Initiative (NBI), regrettably they have not reached similar results in terms of the legal framework and the establishment of the Nile River Basin Commission. Water rights and uses have been the main stumbling block since the early twentieth century. The only way to resolve this issue is through further negotiations. The UN Law Commission spent almost 25 years drafting the framework agreement on the non-navigational uses of international waters, which contained general principles and guidelines to be observed by the riparian in future negotiations. The reported threat of the upper Nile riparian to proceed with signing the framework agreement and the establishment of the commission in the absence of Egypt and Sudan would serve no purpose and would further complicate matters. As was clear from this presentation, the issue is between upstream and downstream riparian. The exclusion of the latter would render any arrangements unsubstantial and void.

EGYPT'S WATER UTILISATION

The perception that Egypt monopolises the Nile waters is not true. Egypt's water share of 55,5 bcm represents about 65 per cent of the waters reaching Aswan, or 3,5 per cent of the total precipitation in the Nile Basin. With a population of 83 million, per capita of water is less than 670 m^3/year, which is far below the universally acknowledged poverty line of 1 000 m^3/year. With a projected population increase reaching 120 million in 2030, the per capita of water is bound to decrease further. Already Egypt's per capita of water is the least among the Nile Basin countries and will continue to be so for the foreseeable future.

These facts have compelled Egypt to optimise the efficiency of its water resources at national level through several comprehensive programmes, the main features of which are the following:

- Recycling drainage water, sewage water after treatment and groundwater of the Nile Valley and Delta aquifers, which originate from seepage of irrigation
- The National Project of Irrigation Improvement in the old lands to raise irrigation efficiency to be in line with drip-sprinkle irrigation used in the new reclaimed areas
- Using groundwater of the non-replenishable deep aquifers of the Nubian Sandstone
- Desalination of brackish water for domestic uses in remote areas
- Rain harvesting
- Changing the crop pattern, using low water consumptive and high value crops.

HYDRO-POLITICS OF THE NILE

Water is too vital an issue, especially for Egypt, to be politicised. It is a technical issue and should remain so. That in turn would facilitate its resolution, if the need arises, to the satisfaction of all riparians.

Unfortunately, some scholars and politicians, from within the Nile Basin and from elsewhere, think differently. They go to great lengths to find correlation between the problems – ethnic, political, economic, etc – confronting the Nile Basin states and Egypt's policies to serve its water interests.

To support their case they refer repeatedly to Egypt's colonial past and claim its policies aim at destabilising the Nile riparians and interfering in their internal affairs, encouraging border tension and armed conflict, domestic unrest and civil wars.

According to their logic, the ultimate goal of Egypt is to consume the Nile riparian resources and divert their attention from development, particularly agriculture and food security, which would require ever-increasing quantities of water, thus threatening Egypt's supplies.

It is true that in the nineteenth century, Egypt expanded southwards, reaching Uganda and Ethiopia, but various scholars attribute that to Mohamed Ali Pasha's dreams of building an empire which led him to launch military campaigns into the Arabian peninsula and northwards across the Levant and u to Anatolia in Turkey, territories which had nothing to do with the alleged Egyptian desire to secure its water resources.

Likewise, Khedive Ismail's campaigns against Ethiopia could be interpreted as an attempt to check repeated Ethiopian incursions in eastern Sudan with a view to expanding the newly born Ethiopian empire at the expense of the competing Egyptian empire. So again water was not the major factor.

As for Sudan, it was granted self-determination in 1953, which culminated in independence in 1956, far ahead of all colonised African countries. The 1959 water agreement that laid the ground for a cooperative and mutually beneficial water relationship was concluded between two fully sovereign and independent states.

An objective review of recent and ongoing tension in the Nile Basin would clear Egypt's slate. The Great Lakes crisis is the result of the historical rivalry between the Hutus and Tutsis, in addition to attempts by sub-regional and world powers to achieve political and economic hegemony. The border dispute between Ethiopia and Eritrea was one between former comrades-in-arms who failed to agree on how to conduct their bilateral relations after the cessation of Eritrea. Sudan and Somalia's differences with their neighbours are the result of their endeavours to

preserve their sovereignty and integrity and resist interference in their internal affairs.

Destabilisation of a riparian is diametrically against Egypt's interest. Since all the Nile sources and tributaries lie outside Egypt, all water projects to harness and develop the water resources would be carried out in the upstream countries. The waters have to travel thousands of kilometres to benefit Egypt. Unless there is peace, security, stability and good neighbourly relations among upstream and transit countries, Egypt could never guarantee its waters. In addition, water projects need years to build and huge investments. It would be very difficult to secure that in a destabilised environment.

The Jongeli Canal in southern Sudan provides an example. Egypt and Sudan spent US$300 million on the project, which came to a halt because of the ongoing fighting in the region. Had the project been completed by 1984 as scheduled, both countries could have benefited and shared 3.8 bcm of water per year, and a total of 68.4 bcm to date. So it is difficult to accept the notion that Egypt's policy toward the other riparians is that of destabilisation.

CONCLUSION

While the issue at hand is that of the Nile water, one cannot de-link it from the overall relations between Egypt and the Nile riparian. Egypt is an African country that is keen to maintain the best relations with other African countries, particularly the Nile Basin countries. Apart from the issue of water, the Nile Basin countries represent strategic depth to Egypt. The Red Sea is the southern entrance of the Suez Canal. Two thirds of the Arab world's population and land mass lie in Africa. In international organisations and forums, Egypt is always represented as an African, not an Arab country; thus Egypt's willingness to maintain excellent political relations with other African countries cannot be overstated. It has always supported African countries in their struggle for independence as well as their nation-building efforts within its limited resources. Recently, economic and trade relations with Africa have been consolidated through the efforts of the growing and active private sector, which currently represents almost two thirds of Egypt's economy.

Egypt's investments in Sudan have reached almost $2 billion, while rapidly increasing in Ethiopia and reaching almost $300 million. Egypt's investments in other Nile Basin countries are also growing but at a slower pace. Trade with Sudan has surpassed $500 million annually and with countries such as Ethiopia and Kenya it reached almost $100 million. Egypt has also been providing African countries with technical assistance through the secondment of experts, particularly in the fields of water and development (Uganda, Kenya, Sudan, and Tanzania).

In other words, maintaining relations with Nile Basin countries will remain a top priority for Egypt.

NOTE

1 Available from http://untreaty.un.org/ilc/texts/instruments/english/conventions/3_2_1978.pdf

Transboundary water conflicts

The experiences of Egypt in actualising water ethics and environmental ethics

Magdy Hefny
Director, Regional Centre for Studies and Research on Water Ethics, Ministry of Water Resources and Irrigation, Egypt

INTRODUCTION

The Nile Basin is one of five regions that have been identified as critical in the analysis of inter-connections between water, food, poverty, and urbanisation. Current and future challenges are related to population growth (310 million people), urbanisation, and other economic development activities. Despite the abundant resources of the Nile countries, many of them are characterised by poverty and underdevelopment; widespread conflict; environmental degradation; and frequent natural disasters such as drought, floods and famine.

The theme of the paper, Transboundary water conflicts: The experiences of Egypt in actualising water ethics and environmental ethics in the Nile Basin, is inspiring. Water ethics and environmental ethics are important factors in mitigating, and ultimately resolving conflict. The main objective of the Regional Centre for Water Ethics is to promote innovative research and education in issues related to water ethics in the Arab and Nile Basin regions. The focus of the centre is on encouraging societal participation in resolving water-related conflicts, building a functioning water ethics society, and promoting awareness of the ethical perspective in all aspects of water use and management.[1]

The main assumption, here, is that a cultural approach is needed that could change the way we think, rather than confine our thinking to the narrow perspective of examining hard factors of the supply side (physical elements) in mitigating water challenges in the Nile Basin. The paper builds on the progress made in implementing the Nile Basin Initiative (NBI) as an established institutional tool for enhancing the quality of life in the region. For this reason, the paper calls for initiating a 'Nile Basin Network for Propagating Water Use Ethics'. This conforms with the widely recognised belief that what is at stake is 'the quality of life of man'. However, in every challenge there is an opportunity.

In addition, the main concern of the paper is to put forward ideas on how best the Nile Basin communities could actualise water use ethics among stakeholders to create a society of water ethics. The approach is cultural and is based on social learning, bottom-up education and communication functions, as well as 'top-down high-level applied research aspects with industry and technology participation.

The paper contains four parts. In the introductory part, arguments are put forward for examining the issue of water and environmental ethics in relation to conflict resolution in the management of the Nile Basin, with special reference to the need for participation, and highlighting conflict management tools. In addition, pertinent language issues of water and environmental ethics are defined that are used through the paper. Then, the paper specifies the overall objective we aspire to achieve.

Part 2 explains the complexity of the Nile Basin challenges and the importance of soft factors of human nature, as well as the challenges of implementing integrated water resource management (IWRM), which takes care of all factors, whether they are of a technical or non-technical nature.

The third part is devoted to the Egyptian experience in implementing IWRM, especially under the new application of the Irrigation Improvement Programme (IIP) and lessons learned.

The fourth part puts forward a raft of ideas for strengthening the implementation processes of the Nile Basin Initiative (NBI), and how best to have a framework for actualising water ethics and environmental ethics in the Nile Basin region.

Annexes 1 to 4 present the soft path of IWRM and tools to address governance failures; Cairo Regional Centre for Studies and Research of Water Use Ethics; seven stages in building participation at mesqa (small canal) level; and a fact sheet on the NBI.

Why bother?

The more recent visible effects of climate change and environmental hazards have compounded water management in the basin. Water and food security in the region are under threat, hence the need for robust transboundary water management. An effective institutional arrangement is a key factor in facilitating this process.

Climate changes are of concern not only from an environmental viewpoint, or in regard to regional water supply, but the impact is felt through the social ramifications of climate change. In countries of the Nile Basin, this is likely to politically destabilise the region by causing waves of environmental refugees from countries including Egypt, as happened in the tragic case of Darfur, Sudan. The expected damage to the economic base and to the residential areas of hundreds of thousands of people in the Nile Basin could lead to grave political implications.

Environmental degradation triggering tensions and conflict in Sudan

According to the Intergovernmental Panel on Climate Change (IPCC) Report, the current conflict in Sudan was triggered by climate change.

A new assessment of the country, including the troubled region of Darfur, indicates that among the root causes of decades of social strife and conflict are the rapidly eroding environmental services in several key parts of the country. Investment in environmental management, financed by the international community and from the country's emerging boom in oil and gas exports, will be a vital part of the peace-building effort, says the report. The most serious concerns are land degradation, desertification and the spread of deserts southwards by an average of 100 km over the past four decades.

These are linked with factors such as overgrazing fragile soils by a livestock population that has exploded from close to 27 million animals to around 135 million now. Many sensitive areas are also experiencing a 'deforestation crisis' that has led to a loss of almost 12 per cent of Sudan's forest cover in just 15 years. Indeed, some areas may undergo a total loss of forest cover within the next decade.

Meanwhile, there is mounting evidence of long-term regional climate change in several parts of the country. This is witnessed by an irregular but marked decline in rainfall, for which the clearest indications are found in Kordofan and Darfur states. While the tensions and conflicts in Darfur are currently in the headlines, the report warns that other parts of the Sudan could see resumptions of historical clashes, driven in part by declines in environmental services. In the Nuba mountain region in Southern Kordofan, for example, the indigenous Nuba tribe expressed concern over damage to trees and other vegetation because of the recent presence of the camel-herding Shanabla tribe.

Like many pastoralist communities, the Shanabla have been forced to migrate south in search of adequate grazing land that has been lost to agricultural expansion and drought in the north. Some Nuba warned of 'restarting the war' if this damage did not cease.

The crisis is aggravated by degradation of water sources in deserts known as wadis or oases. Virtually all such areas inspected by UNEP were found to be moderately to severely degraded, principally due to deforestation, overgrazing and erosion, says the report.

As well as these serious water shortages, flooding and related natural disasters contribute to human vulnerability in Sudan. The most devastating floods occur on the Blue Nile, as a result of deforestation and overgrazing in the river's upper catchment. Riverbank erosion owing to watershed degradation and associated flooding is particularly destructive and severe along the fertile Nile riverine strip.

IWRM is central to conflict resolution

Water conflicts can occur for many reasons. These include interdependence of people and responsibilities; jurisdictional ambiguities; functional overlap; competition for scarce resources; differences in organisational status and influence; incompatible objectives and methods; differences in behavioural styles; differences in information; distortions in communications; unmet expectations; unmet needs or interests; unequal power or authority; and misperceptions.

Conflicts are probably inevitable in water resource management, but IWRM is an excellent approach to resolving such conflicts, ending polarisation and solving impasses in complex situations. IWRM is based on balancing all interests and securing equitable distribution of benefits from the improved management of water. Certain instruments and approaches that are inherent to IWRM, such as stakeholder participation and conflict management tools, allow competing claims to be moderated through well-informed processes.

The need for participation

Stakeholders at all levels of the social structure must have an impact on decisions of water management. Participation is about taking responsibility; recognising

the effect of sectoral actions on other water users and aquatic ecosystems; accepting the need for change to improve the efficiency of water use; and recognising other water users' rights. Therefore, participation is an instrument that can be used to pursue an appropriate balance and achieve long-lasting consensus among users of water.

Conflict management tools

'Conflict management' refers to a broad array of tools used to anticipate, prevent, and react to conflicts. Which tool to select depends on the root causes of the conflict, as well as its circumstances and location. Conflict management tools can be classified into three types:

- *Intervention tools* (facilitation, mediation, fact-finding, and arbitration) usually involve a combination of these aspects.
- *Decision-support-modelling tools* (optimisation, simulation, scenario building and analysis, multi-criteria analysis, shared vision modelling) are heavily relied on to facilitate and support decision-making processes.
- *Consensus-building tools* are used mainly to facilitate intersectoral dialogue on water policy development. They are best used in situations of low to medium conflict and tension. However, they can be useful where parties are in major conflict and have tried legal and other high-cost approaches unsuccessfully.

To put conflict management tools and techniques into practice, the IWRM concept could guide the way we think. This could be illustrated to reflect the complexity of water-induced conflict, triggered through the hydrological cycle limitations, use competing demands of water sectors and in relation to supply, as well as mismanagement of the resource.

Defining ethics and water ethics

Ethics is a branch of philosophy that looks at morality. Ethics looks at the meaning, therefore, of statements about the rightness or wrongness of actions; at motives; at blame; and fundamentally at the notion of good or bad. Nevertheless, ethics is not only the result of existing human or cultural values. Much of environmental ethics for example stems from other types of knowledge, such as ecology, which has driven many of us to think morally about our uses and abuses of the environment, and the impact that societies and modern forms of development have had on natural resources.

Ethics,[2] law, normative behaviour and social responsibility

So ethics is considered the 'science of morality'. It is one of the three major branches of philosophy, alongside metaphysics and epistemology.[3] But is ethics the same as law? Do ethics and law overlap? Literature from various scholars concludes that:

> Ethics is related to but different from and above law; judged by what you do and not by what you know (knowledge).
>
> Ethics is the personalised way in which one makes value-laden decisions.[4]

Preston stated that 'the law floats on a sea of ethics',[5] and we find such overlap when we examine issues and themes that lie at the heart of contemporary legal analysis, such as individual liberty, protection from harm, and the promulgation of a just society.

Issues of 'social justice' are determined by the 'common good' and 'public interest'; general principles of justice and fairness; the protection of human rights; exploration of matters of integrity, truthfulness and honesty; appropriate boundary setting for state intervention in a liberal democratic society; the recognition and management of conflicts of interest; and broader perspectives on acting in ways that are consistent with the duties entrusted to persons in professional roles.

Ethics thus has a relative meaning and differs from one culture to the other and one person to the other. For this reason, it is more reasonable to use the term 'social responsibility', which allows for developing indicators and standards for measuring the progress we have made in actualising water ethics.

Water ethics

Water ethics, as a specific and distinct philosophical field, is still emerging in academic arenas, professional discussions, and dialogues on water governance. Concerns of water conservation – as well as adequate access to basic needs of water and sanitation and the deprivation of all poor and marginalised communities of such a fundamental human right, mostly owing to lack of empowerment and the inability to pay for the service – pose a difficult ethical dilemma that needs to be solved, based on societal ethical frameworks.

These frameworks are also necessary to address issues such as allocation of limited water resources and its relationship to efficiency, productivity, and valuation, as well as equity and social justice. This is especially significant for consideration of environmental conservation and sustainability for future generations within IWRM contexts.

Defining environment and environmental ethics

'Environment' is defined as the sphere or context where human beings live. This includes all natural and human phenomena that affect human beings and are affected by them, from which they obtain their means of subsistence,

and in which they exercise their relations with their human and non-human fellow creatures. Nevertheless, ethics is not only the result of existing human or cultural values. Much of environmental ethics, for example, stems from other types of knowledge, such as ecology, which has driven many of us to think morally about our uses and abuses of the environment, and the impact that societies and modern forms of development has had on natural resources.

In summary, ethical concerns could be highlighted as:

- Environmental ethics: intrinsic values of natural systems
- Social ethics: Social justice, basic needs of life
- Water ethics: Access to drinking water, freshwater uses, water management
- Eco-ethics: Land ethics; soils, plants
- Conservation ethics: Sustainability; consensual philosophy of resource conservation

Overall objectives

The paper's overall objective is to contribute to ongoing efforts by governments and non-governmental organisations [NGOs] to propagate and apply water and environmental ethics for conservation and sustainable development in the Nile Basin region. This will be based on the question of how best to avert and mitigate the impact of climate change and environmental degradation of natural resources in the region.

The practical and institutional side of this paper deals largely with environmental and water management laws and policies which flow from legislation. At the root of laws and policies (standard manifestations of human normative behaviour) that intend to protect and preserve the environment from human activity impacts lie a set of moral principles and beliefs that are accepted by different societies. Most countries now have laws relating

The contribution is also based on the valuable work on water ethics and environmental ethics by the UNESCO Committee on Ethics of Science and Technology (COMEST) and draws on the accumulated experiences of the member countries of the Nile Basin.

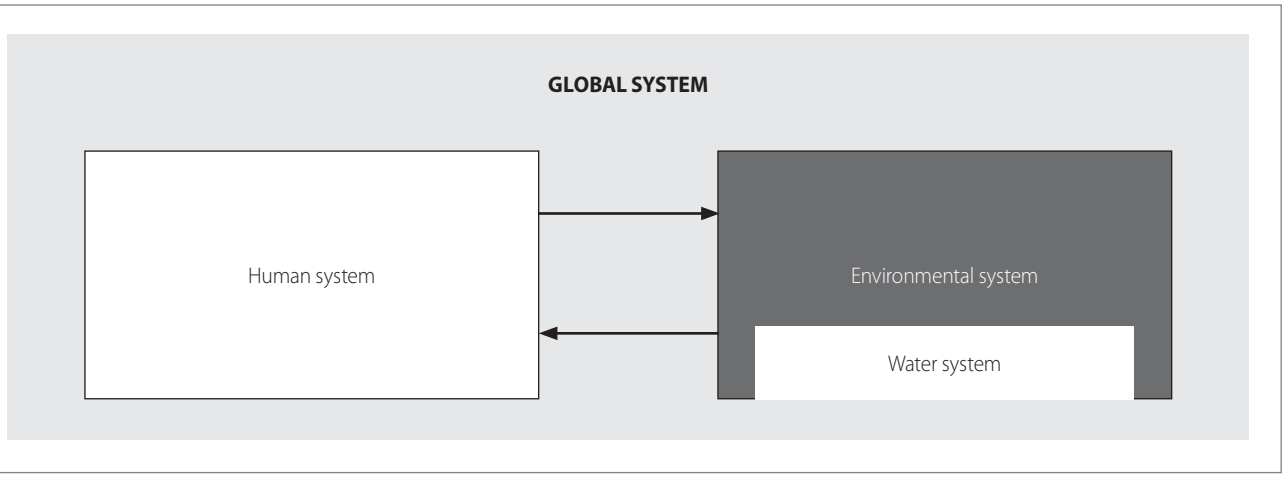
In addition, it may be considered part of the efforts at raising awareness of the environment and environmental issues in the Nile Basin, and creating familiarity with the language, existing and emerging environmental management tools and their application.

The issues here are related to water conservation and pollution control; environmental education; the interrelationship between climate change and life-support systems; combating desertification; ecosystem sustainability; and exchange of experiences and knowledge transfer among the Nile Basin countries. The main assumption is that the cultural approach could change the way we think rather than confining our thinking to the physical elements of the supply side in mitigating water challenges. Moreover, water ethics actualisation has become part of reforms in the Nile Basin, as well as other regions, on the demand side. This means changing the behaviour of water users and modes of uses.

However, to change behaviour, we need to change thoughts (outmoded traditions, outdated and non-relevant modes of education) and systemic structures in the society, for example laws, principles and rules. This change can come through knowledge and experience exchange, awareness building, skills building and problem-solving techniques, which will be the role of the Nile Basin Network on Water Ethics.

This requires a comprehensive systemic analysis that brings together the whole web of relationships among components of the system of water resource management, as well as their complex interaction. The 'system' metaphor also embraces the mental model scientists hold of crucial system properties, such as controllability and

Figure 1 Context of the global system



Source Khouri, Jean, Environmental ethics and its role in conservation, Presentation at Libya Workshop, Tripoli, 19 June 2007

more to poverty. It is becoming an issue of survival, as the poverty syndrome has dominated the socio-political economic agenda since the 1980s. Poverty is looming in most Nile Basin countries[8] and the prescribed remedy of 'poverty reduction strategies'[9] for poorer countries is not enough to cope with the water dilemma.

It is timely to give due consideration and initiate such a process. The Nile Basin, as well as Africa as a whole, could benefit from the work of COMEST's sub-Commission on Water Ethics. This work brought about issues that range from conceptualising and building a framework for localising the Global Freshwater Guidelines to capacity building, processes of social learning through better participation of water research centres, education, water suppliers, water regulators, industrial and agricultural users, and organisations concerned with information and exchange and dissemination.

To make progress in implementing the NBI, it is necessary to emphasise a soft path of propagating water ethics and environmental ethics, with a focus on major activities such as formulating a code of conduct, benchmarking and bench-learning best ethical practices, knowledge transfer, promoting public awareness, and using dialogue. Applying such tools would contribute to better actualising the NBI shared vision, as well as encouraging local initiatives and actions.

Nile Basin: Importance of soft factors of human nature

The Nile basin is one of five regions that have been identified as critical in the analysis of inter-connections between water, food, poverty and urbanisation. About 150 million people live within the basin and twice that number in the countries that share the Nile waters. Despite the rich resources of the Nile, many of these countries are characterised by poverty, widespread conflict, environmental degradation, and frequent natural disasters such as drought and famine.

The population of the Nile basin will probably double by 2025. Factors such as the rapidly growing population, combined with the ecological consequences, and increasing agricultural and industrial development which demands more and more water, are expected to exacerbate the current water crisis. Table 1 shows some demographic and economic indicators.

In addition, table 2 shows outlines challenges and opportunities for international cooperation and sustainable development in the Nile Basin.

The items were grouped and rated according to their perceived importance.[10] The three challenges to which the greatest importance was assigned were:

- Uneven development and regional differences
- Looking for long-term gains and shared interests
- Poverty

With regard to perceived opportunities, these three issues were given the greatest weight:

- The development of joint projects for the benefit of all
- The need for external third-party support (such as partners in the Nile Basin Initiative)
- Maintenance of the momentum of progress by the NBI

These analyses show that soft factors of human nature and social learning need to be attended to for change and

Table 1 Demographic and economic indicators

Total population 2001 (millions)	Projected population 2050 (millions)	Average population growth rate 2000–2005 (%)	Population/ha arable and permanent crop land	GDP per capita ppp $ 1999	Access to safe water (%)	Country
6,5	20,2	3,0	5,3	570		Burundi
52,5	203,5	3,3	4		45	DR Congo
69,1	113,8	1,7	7,6	3460	95	Egypt
3,8	10,0	4,2	5,6	1040	46	Eritrea
64,5	186,5	2,4	4,7	620	24	Ethiopia
31,3	55,4	1,9	4,9	1010	49	Kenya
7,9	18,5	2,1	5,6	880	41	Rwanda
31,8	63,5	2,3	1,1		75	Sudan
36	85,7	2,3	5,5	500	54	Tanzania
24,0	101,5	3,2	2,4	1160	50	Uganda

Source UNFPA 2001

Table 2 Priority ranking of challenges and opportunities in the Nile Basin

Challenges	X = Priority/ importance
Uneven development (regional differences)	X X X
Need for institutional and legal framework	
National emphasis on long-term gains and shared interests	X X X
Water scarcity, efficient water use, increase supply	X
Diversity	
stakeholder involvement	X
Poverty	X X X
Confidence, trust	X X
Environmental degradation	X X
Population growth	X X
Globalisation	X
Instability (regional)	X X
Opportunities	**X = Priority/ importance**
Joint projects for the benefit of all	X X X X X
Awareness of the issues	
Win-win solutions (applied/operationally)	X X X X
Step by step approach	X
External support, third-party assistance (systems approach [a])	X X X X X
Unity in diversity	
Shifting paradigms, cooperation	X
Existing linkages (physical/cultural), common ground	X
Empathy (mutually)	
Progress made under NBI (momentum)	X X X X X

Source M Hefny, and S E-D Amer, Egypt and the Nile Basin. ***Aquat Sci*** 67(1) (2005), 42–50

development of the water sector in the basin to take place. It is becoming a necessity to have a cultural approach to actualising water ethics.

The challenge of implementing IWRM

There has been a shift in paradigm; water is no longer a narrow hydrological phenomenon, but a multi-dimensional resource with its nested political economy factors. The virtues of technical and economic efficiency and environmental consideration are well recognised in reports of world water forums.[11] In these forums, there was a dialogue among civil society, stakeholders and even political commitment, but the emphasis and advocacy was on water as an economic resource rather than a social economic resource.

Since the early 1990s, the hydraulic mission in implementing IWRM has emphasised the need for a new holistic approach and unprecedented political cooperation. IWRM is thus to be linked to the Dublin Principles.[12] The key concepts of IWRM imply an inter-sectoral approach; representation of stakeholders; sustainable development; demand-driven and demand-oriented approaches; and decision making on the lowest level. The question is whether this new hydraulic mission and its approach need to be part of the African strategy for the future.

Nowadays, there is consensus that reliance on physical solutions – although continuing to dominate the traditional planning approach – failed to satisfy basic water requirements for human activities, and above all, caused social, economic, and environmental problems.[13]

Indeed, there are changes in the attitudes to managing water resources. Many countries are redirecting their approaches towards the soft path tactic through developing new methods to meet the demands of growing population

without requiring major new constructions or new large-scale water transfer.

According to a recent report, Abuzeid and Hamdy testified that many countries are changing their way of thinking, particularly those in arid and semi regions.[14] They are beginning to explore the possibility of efficiency improvements, to implement options for managing demand, and to reallocate water among users to reduce projected gaps and meet future needs. They concur that such a change faces strong internal opposition and is not yet universally agreed upon.

THE EGYPTIAN EXPERIENCE

The irrigation improvement programme (IIP) is one of the large-scale projects of the 21st century. It is considered a main element in the overall policy of implementing IWRM. The programme involves a combination of technical changes and infrastructure investment, together with institutional and organisational reforms in the way irrigation water is managed. These institutional reforms initiated tools to actualise them, including the following:[15]

- *Egyptian Water Partnership (EWP)*: This refers to a participatory capacity and empowerment for all stakeholders (farmers, water councils, water users associations, ministries, civil society and NGOs, parliamentarians, politicians, media, universities, research centres, private sector, consultants, youth, children and women). The EWP was launched in 2003 at a general conference, and hence, it was institutionalised with an agreed plan of action.
- *Reform of existing legislation*: Although farmers have traditionally cooperated to organise and pay for operation and maintenance at mesqa level, they had no formal organisations for doing so. Therefore, in recognition that new institutions were required, the government, through law 213 of 1994, amended Irrigation Law 12 of 1984 to enable the MWRI to:
  - Organise farmer groups to operate and maintain mesqa facilities
  - Maintain mesqas and tertiary drains at the farmers' expense, should they fail to do so themselves
  - Implement mesqa improvements and recover the full capital cost of these improvements (without interest)
  - Establish a special revolving fund in the Ministry of Finance for future mesqa improvement

The experience of forming water users associations (WUAs) has helped to create a new generation of engineers, technicians and users who have become experts in building trust between parties. The challenge is to ensure the continuation of mutual understanding at all levels of the irrigation system, so that areas can be located where the demands of users can be met in order to reach potential production, as well as defining areas where real water saving could become reality with less cost. Now, dialogue is the basis for communication that is conducive to bringing about shared ideas and decisions.

A seven-phase process was developed in the IIP areas for sustainable WUAs. Most descriptions of the seven-phase process state the targeted goals and the way these goals have to be achieved. (The steps are summarised in annex III.) The ultimate goal is to increase total farm income by saving labour and time spent on irrigation to ensure good water control for increased production and more equitable distribution of water.

Lessons learned

- A body of knowledge has been tested and piloted that provides strengthens the new reforms.
- To increase the efficiency and performance of the system, users' participation in management is essential since their decisions and ideas have impact on the operation and the modernisation process, as well as its sustainability.
- Increasing the capacity of users, operators and managers requires intensive training.

THE NEED FOR A NILE BASIN NETWORK FOR WATER ETHICS AND ENVIRONMENTAL ETHICS

What kind of network?

In the knowledge and experience economy, a space and time must be created in what is known as a 'knowledge park'. Its aim is to develop an interacting triangular partnership (figure 2) for creating a knowledge-based 'idea' that can be translated into 'a project', which can be subject to 'finance'. It is a network that is shaped along a triangular partnership among researchers, engineers/experts and the private secor.

Figure 2 The interacting triangular partnership

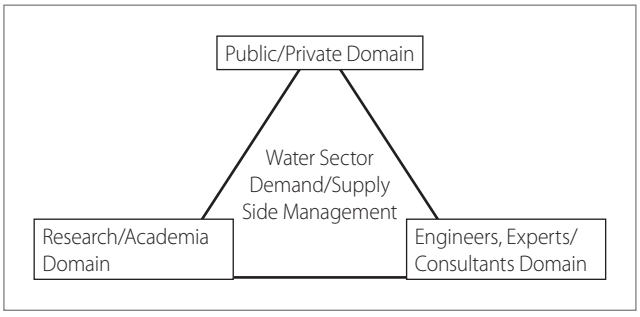
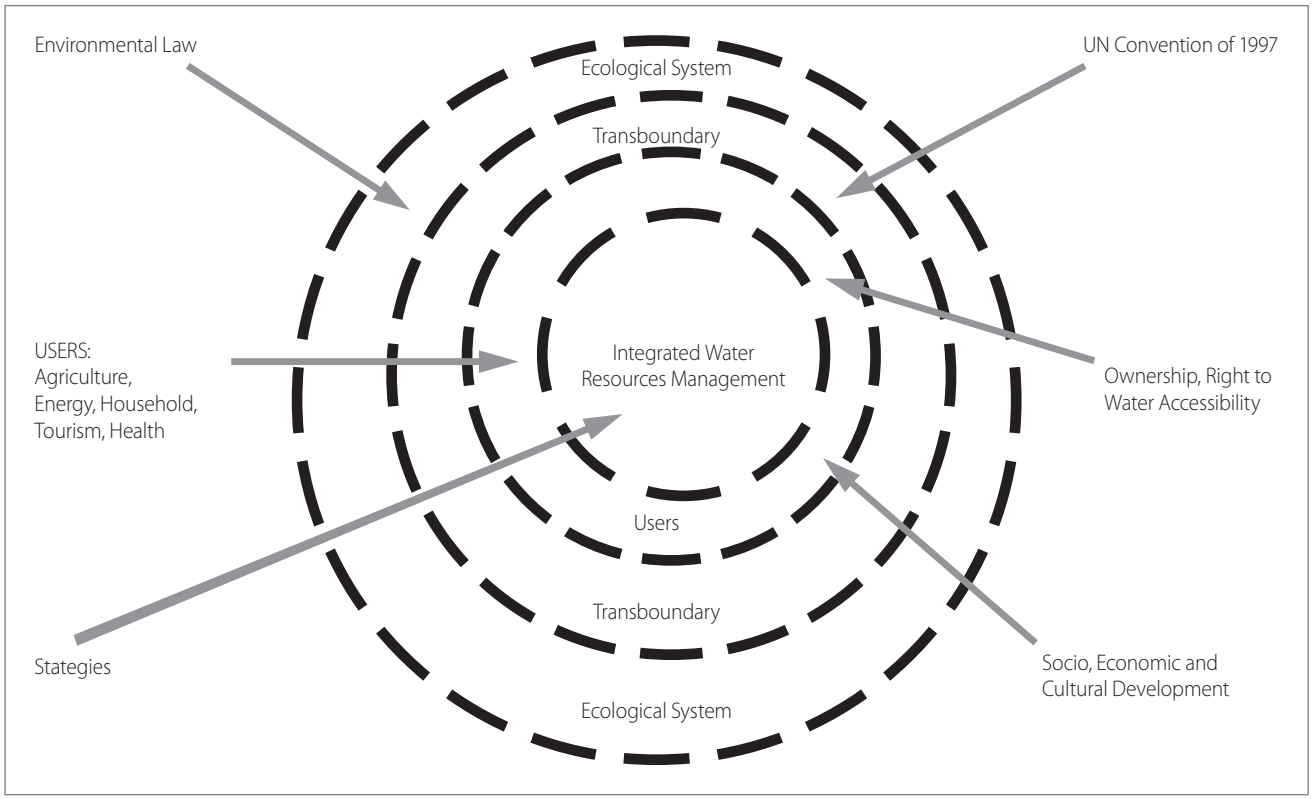


Figure 3 Scope of activities on water ethics (local, national, regional, and international)



Source Cairo Regional Centre for Studies and Research of Water Use Ethics (RCWE)

In this way, it is possible to allow for progress in applying the strategy to actualise water ethics on a regionally wider basis and creating interests.

In addition, one has to ask these important questions: What do we mean by the terms used in water ethics? How do these apply to users of public/private sectors, researchers and experts? What are the major ethical issues regarding the conduct and behaviour of each group? Why is this concern for the NB at this point? What we want to do next.

Proposed activities for NB network

On the establishment of the Nile Basin Network for Water Ethics, it is envisaged that the range of activities (figure 3) could include these spheres:

- The water sector, where strategies and policies represent the guidelines
- National economy level, where sustainability and teamwork among departments and across disciplines are needed
- Cross-border activities among riparian countries of the same river basin
- Internationally, where environmental law has an important role in guiding the activities.

Figure 3 shows this circle of activities.

CONCLUSION

Sensitive to the rising threats, Egypt, with its wide expertise in water management, has taken the initiative to establish the RCWE because of its conviction of the importance of actualising water ethics in support of major initiatives locally and regionally. Needless to say, Egypt has its water and environmental research and educational institutions and, in cooperation with a consortium of other research and educational centres, industry, water utilities, NGOs, and inter-governmental bodies in other countries, can serve as a much-needed, and long-overdue forum.

A systems view means a holistic approach that is based on comprehensiveness and interconnectedness of hydrological, economic, political, social and environmental concerns, with human beings at the centre of the complex management problem. Problems are tackled simultaneously because they are linked.

NOTES

1 The Regional Centre for Research and Studies of Water Use Ethics (RCWE) is affiliated to the Ministry of Water Resources and Irrigation (MWRI) in Egypt. It is one of three RENEW nodes established by UNESCO-COMEST in 1998. It was created by the World Commission on the Ethics of Science and Technology (COMEST). COMEST has established four

sub-commissions, one of which is the Sub-Commission on Freshwater Use, which has been focusing on water ethics issues.

2 Ethics, by definition in dictionaries, refers to (i) a set of principles of right conduct. (ii) A theory or a system of moral values. (iii) The study of the general nature of morals and of the specific moral choices to be made by a person; moral philosophy. (iv) The rules or standards governing the conduct of a person or the members of a profession, eg medical ethics.

3 The free dictionary, available at http://encyclopedia.thefreedictionary.com/ethics.

4 Ibid.

5 N Preston, *Understanding ethics*, 2nd edition, Sydney: Federation Press, 2001, 24.

6 I G Simmons, *Interpreting nature: Cultural constructions of the environment*, New York: Routledge 1993.

7 Claudia Pahl-Wostl, Towards sustainability in the water sector: The importance of human actors and processes of social learning, Institute of Environmental Systems, Research University of Osnabruck, Germany, 18 December 2002.

8 According to the UN list of poorer countries, Africa has the largest number.

9 Poverty reduction strategy papers (PRSPs) usually contain the national priorities and budget requirements for certain actions towards poverty reduction.

10 S E-D Amer, Y Arsano, A El-Battahani et al, Sustainable development and international cooperation in the Eastern Nile Basin, *Aquat Sci* 67(1) (2005), 1–14.

11 Examples include The Hague 2000, World Water Council 2000, Global Water Partnership 2000 and World Water Commission 2000.

12 The Dublin Statement and Conference Report expresses a holistic, comprehensive, multi-disciplinary approach to water resource problems worldwide. It is based on four 'guiding principles' which cover environmental, social, political, and economic issues:

- Fresh water is a finite and vulnerable resource, essential to sustain life, development, and the environment.
- Water development and management should be based on a participatory approach, involving users, planners, and policy-makers at all levels.
- Women play a central part in the provision, management, and safeguarding of water.
- Water has an economic value in all its competing uses and should be recognised as an economic good.

13 M Abuzeid and A Hamdy, Water crisis and food security in the Arab world: Where we are and where do we go? The Mediterranean Agronomic Institute of Bari, Italy, 2004.

14 Abuzeid and Hamdy, Water crisis and food security in the Arab world.

15 Metawie, Abd Elfattah 2003. Egypt: The role of water users associations in reforming irrigation, A case presented to the Global Water Partnership, available at http://gwpforum.netmasters05.netmasters.nl/en/listofcasesFrame_en.html.

ANNEX I: SOFT PATH OF IWRM

IWRM TOOLS TO ADDRESS GOVERNANCE FAILURES

IWRM tools	Governance failures
Policies Economic instruments Financing and incentive structures and polluters	■ Failure to correct market distortions ■ Inappropriate price regulation ■ Perverse subsidies to resource users
	■ Inappropriate tax incentives and credits ■ Existence of upstream-downstream externalities (environmental, economic and social)
Regulatory instruments Institutional capacity building	■ Over- or under-regulation ■ Conflicting regulatory regimes ■ No independence or impartiality of the organisms of regulation ■ Provision of water services is natural monopoly
Information management Water campaigns and awareness raising	■ Imprecise reflection of consumer preference systems ■ Short-sightedness ■ Voter ignorance and imperfect information ■ Special interest effects, including political weaknesses and vested interests
Role of the private sector	■ Little entrepreneurial incentive for internal efficiency
Institutional roles Social change instruments	■ The inability of the government to control and regulate the sustainable use of water ■ Non-payment of services linked to water ■ Bureaucratic obstacles or inertia ■ Lack of an overall responsible authority
Water resource assessment Plans for IWRM	■ The lack of effective knowledge of the resource, the demands imposed on the it and the current uses that are made of it
Legislation Water rights	■ Ill-defined property rights, unclear ownership ■ Absence of or inappropriate legislation ■ Unclear ownership of property rights
Water resource assessment risk assessment and management	■ Ignorance and uncertainty about water markets, droughts, floods, etc, leading to inability to set prices correctly

Source P Rogers and A W Hall, Effective water governance, Global Water Partnership, Technical Committee (TEC), TEC Background Papers No 7, 2003

ANNEX II

Cairo Regional Centre for Studies and Research of Water Use Ethics

Egypt is one of the oldest hydraulic civilisations. Other countries in the Nile Basin region also have a long history in water management in a broad environmental and climatic range from forests to hyper arid deserts. The region today is one of the main areas that suffer shortages of water owing to factors that range from rapid population growth to climatic change. This poses serious threats to the stability and prosperity of the region.

In this node, Egypt, with its wide-ranging expertise in water management, its water research and educational institutions, and in cooperation with a consortium of other research and educational centres, industry, water utilities, non-governmental organisations, and inter-governmental bodies in other countries, will serve as a much-needed, and long-overdue forum to:

- Publicise and disseminate information on the ethics of freshwater use as embodied in the work of the COMEST sub-Commission on the Ethics of Freshwater
- Engage all stakeholders in exploring issues related to the ethics of freshwater use, to develop guidelines for just practices of water technology, water science and water management
- Undertake and encourage innovative research in issues related to water-related problems in Arab and African regions,
- Develop a regional training course on the ethics of managing water resources for various levels from policy makers to technicians
- Develop an institutional framework for exchanging scholars, experts, and trainers

- Organise workshops, seminars, field trips, and on-site training in specialised water topics to insure equitable access to the most up-to-date water research data
- Create a partnership among research, educational, governmental, non-governmental organisations, the public, and industry to build a viable water society in the region

ANNEX III: SEVEN STAGES IN BUILDING PARTICIPATION AT MESQA LEVEL

Phase and timing	Goal	Focus/comments
Phase One: Entry Information and understanding Time requirements: 1–2 months	To gain the acceptance of unit command area leaders including farmers and those leaders in the public and private sectors; to introduce the IIP to mesqa water users through communication, meeting and individual contacts; and to collect essential information with active participation of mesqa leaders.	This first phase should put sustainable emphasis on the *building of trust* and relationships of friendship. Such a process can be initiated more effectively if a qualified group organizer stays permanently with the community and the WUA(s).
Phase Two: Initial Organisation and Study Time requirement: 2 weeks to 1 month per mesqa / WUA	To establish strong base for building a private (WUAs) by assisting water users on a mesqa to select/elect their leaders. Determine initial roles and responsibility, meet on a regular basis to solve problems and consultation with IIP engineers.	Emphasis in this phase is very much on the *communication and dissemination* of information about IIP, WUA and its consequences for the present mesqa layout and organization. Introduce cost sharing principles.
Phase Three: Planning and Design for Mesqa Improvement Time requirements: 2 weeks after ending phase 2	To involve the WUA(s) council members in active decision-making regarding making the planning, designing and acceptance of the final mesqa design.	The focus is on the design approval. Other outputs may include: a WUA Workshop for improvement, a rapid appraisal of the mesqa, discussions based on data collection results.
Phase Four: Implementation and hand-over of Mesqa Improvement Time requirements: 2–3 months/mesqa	Active involvement in decision making and planning and involvement of farmers in design. The role of the WUAs planned by Council.	WUA council involved in design and construction, the contractor's work plan is to be analyzed and reviewed. Heavy organizational inputs are necessary for all issues and training.
Phase Five: Regular WUA Operations (O&M phase) Time requirements: Regular training is given within a week of completion of phase 4	The final goal is to establish a *sustainable self reliant WUA* which is fully owned. Controlled and operated by the farmers for their benefits to be achieved by improved production possibilities.	This is a continuous phase, which must be regularly monitored, evaluated and improved to maintain optimum operation under changing conditions.
Phase Six: Branch Canal Water User Associations (BWUA s)	Goal: To increase the effectiveness of main system operations and communication between water users and water suppliers by assisting the irrigation authorities in maintaining and participating in the canal system. Grouping of the WUA to branch level should start after the completion of phase 5.	To also provide water users voice and improved communication with water supplies. The BWUA federation can enter into private business activities and can purchase properties and equipment and take loans from credit institutions.
Phase Seven: Continuous Monitoring and Evaluation	To ensure effective process documentation of all six phases and periodic internal and external evaluation of this total WUA program.	Results, documentation and other studies are used as *feedback to improve the process for building sustainable WUAs.*

Source Metawie, Abd Elfattah 2003. Egypt: The role of water users associations in reforming irrigation, A case presented to the Global Water Partnership, available at http://gwpforum.netmasters05.netmasters.nl/en/listofcasesFrame_en.html

Session III

Climate change in Africa

Legal, policy and institutional challenges

The role and experiences of regional economic communities in managing climate change and transboundary water conflicts in Africa

The case of the Intergovernmental Authority on Development

Kizito Sabala
Political Officer, IGAD-Liaison Officer, Nairobi

INTRODUCTION

One of the distinguishing features of the IGAD region is its endowment with transboundary water resources that are shared between two or more riparian states. These water resources have been there for aeons, whereas political boundaries have been drawn and redrawn. In some cases, the water sources serve as borders, but the extent to which these resources should be shared remains a source of concern, and in some cases it has sucked in political leadership at the highest level. For instance, the disputes over Migingo Island on Lake Victoria have invited comments from both the Ugandan (Yoweri Museveni) and the Kenyan (Mwai Kibaki) presidents. The water systems in the IGAD region can be clustered into at least five water catchments areas. These are the Nile system, the Ghibe-Omo-Turkana system, the Ganale-Dawa/Juba system, the Wabeshebelle system and the Red Sea system.

It is not only inland river basins that are shared by the IGAD countries, but also the sea and lakes. Lake Victoria, the second largest freshwater lake in the world, is shared by three countries (Kenya, Uganda and Tanzania). Low-level conflicts have been noted, owing to unclear borders of the islands. Other shared lakes are Lake Turkana and those in the western Rift Valley of Uganda.

Sections of the IGAD region are separated from the Arabian peninsula by about 25 km at the strait of Bab–el Mandab on the Red Sea southern flank, while the Yemen Island of Perim is situated in the middle of the strait. This peninsula borders eight littoral countries, four of which are on the African side and are significant players in water-resource sharing in the IGAD region. These are Djibouti, Egypt, Eritrea and Sudan. Like the inland

Figure 1 Shared water resources in the IGAD region and beyond

Countries	Shared rivers / water systems[1]
Burundi, Democratic Republic of Congo, Egypt, Ethiopia, Eritrea, Kenya, Rwanda, Sudan, Tanzania and Uganda	Nile basin
Ethiopia, Kenya, Ethiopia/Somalia	Ghibe-Omo-Turkana system
Ethiopia, Kenya and Somalia	Ganale-Dawa/Juba system
Ethiopia, Sudan and Egypt	Wabeshebelle system
Djibouti, Eritrea, Sudan and Egypt	Red Sea system
Ethiopia, Sudan	Barka
Tanzania, DRC, Burundi, Rwanda, Kenya, Uganda, Sudan, Egypt	White Nile (Nile sub-system)
Ethiopia, Eritrea and Sudan	Merb-Gash
Kenya, Tanzania, Rwanda, Sudan, DRC	Abbay/Blue Nile (Nile sub-system)
Ethiopia/Sudan	Baro-Akobo/Sabat sub-system

Source Adapted from Asfaw, Water resources and regional development[2]

countries, the utilisation of the Red Sea is characterised by latent tensions regarding existing as well the potential marine, mineral (metallic and energy) and tourist resources because of the lack of regulatory legal frameworks and institutional mechanisms.[3]

PROBLEM

There is no country in the IGAD region that does not share water resources with one or several of its neighbours. At least 60 per cent of the IGAD total surface area is occupied by international basins, making judicious consideration of the management and equitable development of shared resources very important, particularly between upper and downstream countries.[4] Often conflicts over these shared resources revolve around control, utilisation and management, and reflect national, regional, and international contexts.

Although these clashes involve sharing the water, they include other important sources of conflicts. For example, disputes between fishermen on Lake Victoria in the Nile water catchment areas have wider policy implications, involving at least the 10 countries that constitute the Nile Basin Initiative (NBI).[5] This initiative forms the foundation for developing a legal or institutional mechanism for collaborative utilisation of the shared water resources among the 10 countries. However, the initiative is still faced with several challenges, thus it has yet to succeed in forging an effective, viable cooperative mechanism for developing and utilising the resources of the Nile water system.[6]

The problems of mitigating transboundary conflicts over unregulated usage of shared water resources are critical in the IGAD region since currently there are no laws regulating these resources or customary regimes. Even where regulatory frameworks exist, these are unable to deal with the complex nature of the problem. These include the hydro-metrological survey of Lakes Victoria, Kioga and Albert (HYDROMET) (1967); *UNDUGU* (Swahili word for brotherhood) between Egypt, Sudan, Uganda, DRC, and Central African Republic as founding members; and the Technical Cooperation Committee for the Promotion of the Development and Environmental Protection of the Nile basin (TECCONILE) of 1992. It seems therefore that peaceful and collaborative utilisation of the shared water resources in the region is a sine qua non for current and future survival and development of the region.

The economic significance of the shared water resources for the countries of the region and beyond cannot be overemphasised. They support agriculture, pastoralism, agro-pastoralism, navigation, fishing, hydropower, tourism and trade. The most significant resource is the Red Sea, which links eastern Africa with the rest of the world (Europe, Asia and America).[7]

Apart from the ongoing efforts (bilateral and multilateral) to develop normative and institutional frameworks on the control, management and utilisation of the shared water resources in the region, other initiatives include the formation of multilateral and bilateral commissions such as the Permanent Joint Technical Commission between Egypt and Sudan, the Kagera River Basin Commission between Tanzania, Uganda, Rwanda, and Burundi, and the Lake Victoria Development Commission between Uganda, Kenya, and Tanzania.

IGAD AND TRANSBOUNDARY WATER CONFLICTS IN THE REGION: ROLE AND EXPERIENCES

The agreement establishing IGAD explicitly lays the foundation for common approaches to shared crises to mitigate common problems through enhanced cooperation in the region.[8] This legal grounding is pursued through four broad strategies; development information, capacity building, policy formulation, and research. All these are meant to empower IGAD to play its facilitative role more effectively.

The central role of water in the development of the IGAD region has been recognised in studies and proposals since the creation of the organisation. Notable among these early efforts was the involvement of IGAD in the World Bank–UNDP sub-Saharan Africa hydrological assessment of the region. This study[9] concluded that water management in the region was constrained by lack of data and information and of concerted integrated water management. More so, it highlighted the problem of vast areas and insecurity in the region as major constraints to collecting reliable information for water management. The proposed Hydrological Cycles Observation System (HYCOS) and IGAD Integrated Water Resources Management proposals resulted from the study.

While ordinarily conflicts arising from the transborder water resources would fall under the Directorate of Peace and Security, the technical aspects demand a more specialised approach. Thus, a significant portion of water and environment aspects is handled by the Directorate of Agriculture and Environment in the IGAD Secretariat.[10] The overall goal of the IGAD Environment and Natural Resources Strategy (2007) reiterates the focus on environment and natural resources. It states that the goal is to 'assist and complement the efforts of the member states in environment and natural resources management'. However, the approach is more holistic, because different but reinforcing aspects of environment and peace and security are addressed by different programs of IGAD.

IGAD Directorate of Agriculture and Environment

Two programmes on water are relevant to the transborder waters in the region: Mapping, Assessment and Management of Surface Water, executed by the Observatoire du Sahara et du Sahel (OSS); and the proposed Hydrological Cycles Observation System (HYCOS), to be implemented jointly by IGAD and the World Meteorological Organization (WMO).

IGAD, in cooperation with the OSS, has to carry out data collection, mapping and management of transboundary water resources. The aim is to promote joint management of shared water resources for sustainable development, cooperation and economic integration in Africa through scientific and technical cooperation.[11] The programme on Mapping, Assessment and Management of Surface Water charts and assesses the quality and quantity of surface water in the IGAD region. This was occasioned by the reality that knowledge of surface and underground water in the region is lacking. Furthermore, even the quantity of these sources (surface and underground) is not known. In addition, the region is not aware of how much water it can store, when, in what quantity, and how long such storage can take. Despite the importance of water resources in the region, it does not have a strategy for this important resource. Furthermore, almost all water catchments areas are threatened not only by human activities, but also by natural factors. Information collected on each of these aspects over the project period will inform the formulation of viable, actionable plans on water management and utilisation.

The second programme, which is still under consideration, is HYCOS. Overall, this programme aims to install and use satellites to monitor the flow and quantity of water resources and rainfall systems in the region, with a view to updating policy makers so that they can make informed decisions on drought patterns, among other issues. These water resources include rivers, lakes and dams.

Livestock policy

Livestock constitute the main source of food, capital and cash income for the pastoralists of the IGAD region and are an important asset for agro-pastoralists. IGAD livestock production has suffered very much for the last 10 years, owing mainly to periodic decimation by drought diseases, shortage of water and deterioration of natural pastures. ASALs (arid and semi-arid lands) have sustained periodic shocks in the form of droughts, with variable responses. While indicators of productivity, carrying capacity and resilience continue to be debatable, the pastoralists are moving far and are ever decreasing. There is also a preferential shift from cattle to smaller livestock and camels.

The impact of and response to range degradation are not confined to pastoralists. As a result of periodic droughts and desertification, intensified by civil strife and local conflicts, large-scale out-migration from the ASALs and the concentration of populations in small urban centres have created a class that is vulnerable, destitute and relies permanently on famine relief. It erroneously confirms the notion that equates marginal lands with poor people and poverty. Research has shown that with appropriate management and inputs, the IGAD ASALs could sustain three times the present livestock population.[12] That goal can be achieved only when there is willingness to allocate resources and put in place appropriate policies in these areas. The IGAD Livestock Programme attempts to address these challenges, especially in training, information and in enhancing the pastoral communities' indigenous technical know-how.

CLIMATE CHANGE IN THE IGAD REGION

Like any other territory, the region will not be spared the anticipated threats posed by climatic change and vulnerability. In fact, the region has factors that make it even more vulnerable to climate variability and change:

- Eighty per cent of the IGAD region is arid or semi-arid
- It is reliant on rain-fed agriculture
- Climate variability/change have severe impacts on agricultural production and consequently the GDP
- Over 80 per cent of disasters of natural origin are weather and climate related, yet there are no disaster risk reduction policies
- Overgrazing, poor cultivation practices and land fragmentation add to its susceptibility
- All the countries in the region are less developed and suffer poverty

Manifestations of climate change

Climate change poses a huge threat to the attainment of the Millennium Development Goals (MDGs), especially in the IGAD region. Manifestations of climate change:

- Instrumental and proxy records have shown significant variations in the space-time patterns of climate in the IGAD region. Such records include indices derived from temperature, rainfall, and changes in lake levels.
- The dramatic disappearance of tropical mountain glacier cover, such as on Mount Kenya, has been attributed partly to global warming

- There are frequent occurrences of droughts and floods, and therefore shifts in the grazing patterns of pastoral communities, changes in human settlements and movement, and increasing wildlife-human conflict over resources. Floods and droughts associated with extreme climate events lead to:
  - Loss of lives and property, as well as loss of livelihood, resulting from famine
  - Economic losses because of the decrease in hydropower generation and in agricultural produce and pastureland for pastoralists.
  - Damaged infrastructure, displaced people and possible social disorder
  - Landslides, associated with extreme rainfall events
  - Increase in vector-borne diseases such as highland malaria, owing to the temperature rise associated global warming
  - Outbreaks of Rift Valley Fever, associated with extreme rainfall events caused by El Niño

Generation of ecological refugees

In olden times, when the population was low in number and land was available, shifting cultivation and nomadic pastoralism were possible and economic ways of survival. However, in modern days of high population on limited land and scarce resources, this becomes a problem. Exacerbated by artificial political borders and changing climatic patterns, ecosystems are exploited to the point of collapse. In reaction to this phenomenon, communities abandon one area and move to others. But since there are no empty areas for occupation, conflicts always arise between the indigenous people and the invaders. This results in ecological refugees – people displaced by ecological degradation or disaster – of whom there are many in the region. Official estimates place the number of ecological refugees at about 10 million, but the number may be significantly larger. In any case, ecological refugees outnumber all other categories of refugee, including those displaced by war. Since the population is on an upward trend in the IGAD, the number of ecological refuges will continue to increase with the impact of climate change, which has been historically underestimated.

Expanding dry lands

Dry lands cover over 80 per cent of the IGAD region, and are home to 20 per cent of the region's population. Although these lands have higher than average levels of poverty and insecurity, they possess rich biodiversity, mineral resources, livestock and products such as gums, resins, dyes, honey, medicines and cosmetics. The regions are characterised by climatic uncertainty; thus many people do not understand the dry lands, and many countries categorise them as wastelands: regions of little value that have not yet been put to good use, even though many dry-land areas have been fenced off for the sake of conservation and wildlife. As a result, there is widespread neglect of practices that are sustainable and have managed the dry lands for millennia, and there is a tendency to promote alternative land uses that are less sustainable, and are likely to render the dry lands 'wastelands' in a relatively short time. Dry lands are not wastelands and could be utilised to contribute to the national economy instead of being home for insecurity and banditry.

IGAD and climate change: Role and experiences

The issue of climate change in the IGAD region is handled by the IGAD Climate Prediction and Application Centre (ICPAC).[13] Related elements come under the Directorate of Agriculture and Environment of the IGAD Secretariat.[14] ICPAC is an IGAD specialised organ on matters of climate change and prediction, not only in IGAD countries, but also in Burundi, Rwanda and Tanzania. It started as a drought monitoring centre, with its headquarters in Nairobi (DMCN) and had a sub-centre in Harare (Drought Monitoring Centre Harare, DMCH) in response to devastating weather-related disasters. In October 2003, the IGAD Heads of State and Government adopted DMCN as a specialised IGAD institution at their 10th summit in Kampala, Uganda. The name of the institution was changed to ICPAC at the same time to better reflect its new mandate, mission and objectives in the IGAD system. A protocol integrating the institution fully into IGAD was signed on 13 April 2007.

ICPAC programmes on climate change

IGAD has several programmes and activities that concern climate change directly or indirectly:

- Monitoring climate change and variability stress on 10-day, monthly and seasonal time scales by analysing climatic parameters such as rainfall, temperature and mountain glaciers and issue early warning to member countries (climate and weather bulletins)
- Predicting climate on 10-day, monthly and seasonal time scales; (production of climate watch and El Niño updates for impact early warning)
- Producing annual climate summaries
- Modelling climate variability and change
- Generating products tailored for sector-specific applications, including early warning products for disaster-risk reduction

- Assessing climate-related socio-economic impact
- Building capacity for climate scientists and users through training in monitoring, diagnostics; prediction; in climate change adaptation and mitigation measures; and in interpretation and use of climate products
- Organising regional climate outlook forums
- Applying pilot projects to demonstrate benefits of climate early warning advisories and community adaptation to climate variability and change
- Applying innovative methods and tools for climate prediction and application
- Mainstreaming climate information, especially climate change adaptation for sustainable development
- Mapping out climate risk zones and identifying threats (drought, floods, landslides etc) in the IGAD region[15]
- Translating climate changes into the local vernacular (Masai and Luyia)

NEXUS BETWEEN TRANSBOUNDARY WATER, CONFLICTS AND CLIMATE CHANGE

Water is a source of conflict, and with conflict, ecosystems are at risk. The earth's climate and its impacts respect no borders in an era when water is becoming a source of serious conflict within and between countries. They are at risk from climate change, conflict, and damaging development practices. Climate change is anticipated to dramatically change water availability in some parts of the world, with those areas that are already facing water shortages becoming even drier, and with many countries storing more water to overcome greater variability in supplies, generating more hydropower, and growing more thirsty crops for bio-fuels. Within the IGAD member states, groundwater reserves are used to irrigate their crops, but because the rates of groundwater extractions often exceed replenishment, this source of water will also fail.

The nexus between conflicts on transboundary water resources and climate change is easy to discern. For instance, there are latent conflicts among fishermen between Ethiopia and Kenya on Lake Turkana and between Kenya and Uganda on Lake Victoria. The conflicts between communities utilising resources on Lake Turkan in Kenya and the River Omo in Ethiopia have taken a different dimension with the ongoing construction of a dam on River Omo. The dam seems to threaten the volume of waters of Lake Turkana downstream. The Turkana community has complained that as a result of the dam, the volume of the water in the lake is greatly decreasing with far-reaching implications for future fish production and the ecosystem around it.

The effects of climate change have affected the water levels in key water catchments areas in the region, thus influencing agricultural production, livestock keeping, and fishing production, thereby the livelihood of the entire population.

CONCLUDING NOTE

IGAD remains a key institution in its region on issues of climate change and transboundary water resources. For instance, the IGAD draft Peace and Security Strategy (2009) fully acknowledges the current and potential conflicts on transboundary water resources. The establishment of ICPAC as a specialised institution on matters of climate change is a testimony to this.

To be effective, ICPAC will have to strengthen links with consumers of its products. These include specialised institutions at regional, national, and international level to ensure that they enlighten policy formulation on climate and environment-related programmes. Capacity building should remain an integral part of ICPAC's strategic direction to ensure the right interpretation and therefore utilisation of its products by policy makers and end users including farmers.

The IGAD OSS Programme could have great input in gathering data and information on the natural features, flow and physical characteristics of the rivers under study. Making such data and information readily available to member states would help them greatly in initiating dialogue and discussion, on pressing issues such flood control and weather forecasting.

NOTES

1 For a discussion on these water systems and the sub-systems, see Yacob Arsano, Transboundary waters in the Horn of Africa, in *Towards a regional security architecture in the Horn of Africa Part* 2, Africa Peace Forum, Nairobi, 2005.

2 Adapted from Asfaw, Water resources and regional development. Kenya, *Jotoafrika* 2, November 2009. The column on annual run-off in billion cubic metres (bcm) has been deliberately omitted.

3 Y Arsano, Hydropolitics of the Horn of Africa: Challenges and opportunities for the 21st century, paper presented at the 7th Nile Conference, Cairo, 15–19 March 1999.

4 African Development Fund. IGAD Watershed Management Study 1993, available at http://www.afdb.org/fileadmin/uploads/afdb/Documents/Project-and-Operations/MN-2003-004-EN-ADF-BD-WP-MULTINATIONAL-IGAD-APP-REPORT-POST-SMC1.PDF, accessed August 2009.

5 The NBI was launched in 1999 and brings together ten countries that share the Nile River. It is a framework through which member states can cooperatively develop the resources of the Nile Basin to fight poverty and promote socio-economic

development in the region. For more information visit www.nilebasin.org, accessed 6 December 2009.

6 For political and legal issues and tension on the shared water resources in the Horn Africa, see Yacob Arsano, Transboundary waters in the Horn of Africa .

7 For the economic potential of some of the shared water resources, see UNDP (1997), Human Development Report, Oxford: Oxford University Press; and World Bank World Development Report (1998–99), Oxford University Press, New York.

8 Article 13A(f) pledges to coordinate their efforts towards the sustainable management and utilisation of shared natural resources. Article 18A (a): Member states agree to take effective collective measures to eliminate threats to regional cooperation peace and stability.

9 It was carried out (1989–1992) by Sir Alexander Gibbs in association with the British Geological Society and the Institute of Hydrology in Britain.

10 Other broad programmatic areas are economic cooperation and social development; and peace and security.

11 Support for mapping, assessment and management resources in the IGAD sub-region, Appraisal Report, African Water Forum, March 2007.

12 IUCN (International Union for the Conservation of Nature), *IUCN Sahel Studies,* 1989.

13 For more on the institution, visit IGAD Climate Prediction and Applications Centre, available at www.icpac.net, accessed 12 January 2010.

14 Other two broad programmatic areas are economic cooperation and social development; and peace and security.

15 UNDP, sponsored project, 2003.

The role of ECOWAS in managing climate change and transboundary water conflict

Hajiya Raheemat Momodu
ECOWAS Liaison Officer to African Union

INTRODUCTION

West Africa remains one of the regions that are forecast to be the most affected by climate change. Over the last three or four decades, the impacts of climate variability have demonstrated the region's vulnerability. In recent years, national and local stakeholders in all sectors have made significant efforts to adapt. However, as illustrated by recent food crises and widespread flooding, the region continues to be highly vulnerable to climate change and climate variability.

Climate change scenarios for West Africa indicate that the climatic variability currently being experienced is likely to intensify. Droughts, floods and storms will probably increase in frequency and intensity. Precipitation levels and patterns are likely to change. Temperatures are expected to increase across the board, exacerbating other climatic impacts. In coastal zones, rises in sea level and sea temperatures will threaten coastal areas and ecosystems. The prospective impacts on society and economies across the region are huge, potentially affecting all sectors and all groups of people in a negative way. The poor and the marginalised are expected to be particularly affected.

To address such prospects and reduce the social, economic and environmental impacts of the expected climate changes, countries across West Africa have identified medium- and long-term adaptation measures in their national communications (NC) to the United Nations Framework Convention on Climate Change (UNFCCC). Many have also identified urgent priority measures in the framework of their national adaptation programmes of action (NAPAs). While these efforts are important and deserve to be continued and supported, for diverse reasons they must be complemented with concerted adaptation responses at regional level.

In this context, at the International Conference for the Reduction of Vulnerability to Climate Change of Natural, Economic and Social Systems in West Africa, Burkina Faso, January 2007, and the Ministerial Meeting on Climate Dialogue, Cotonou (Bénin), November 2008, consensus was reached on the need to develop and implement an action programme to reduce the vulnerability of West Africa and Chad to climate change. The Permanent Interstate Committee for Drought Control in the Sahel (CILSS), the Economic Commission for Africa (ECA), and the African Centre of Meteorological Applications for Development (ACMAD), under the authority of the Economic Community of West African States (ECOWAS), were mandated to develop an action programme.

The Regional Action Programme to Reduce Vulnerability to Climate Change in West Africa was developed in two parts. Part I, Overview of West African Vulnerability to Climate Change and of Response Strategies, is based on a detailed review of the literature, an analysis of questionnaires sent to key national stakeholders, and a vast number of interviews with key regional organisations. It provides the background and context for a regional action plan for the reduction of vulnerability to climate change in West Africa and Chad:

- It provides an overview of the vulnerability to climate change of West African countries and Chad
- It synthesises efforts undertaken in the region to adapt to climate change
- It provides a summary assessment of opportunities and capacity barriers

Part II, The Strategic Action Plan, presents the strategy and sub-regional action plan to reduce the vulnerability

of West Africa and Chad to climate change, and sets out a strategic vision and operational way forward for adapting to climate change at regional level.

In the recent past, the most important impacts of climate variability in the region have been related to land degradation. The action programme is therefore closely linked with efforts to reverse land degradation, and enhance technical and institutional synergies. Because of the borderless effect of climate change, the action plan covers all 15 ECOWAS member states, Mauritania and Chad.

PRE-REGIONAL ACTION PROGRAMME EFFORTS

Since the 1960s, West Africa, and the Sahel in particular, has experienced a change in rainfall that has profoundly modified the natural environment and the populations' ways of life. In response to this situation, significant efforts to adapt to drought and resulting land degradation have been undertaken for several years and in many sectors at local, national and regional level. By the mid 1990s the countries in the region had ratified the United Nations Framework Convention for Climate Change (Liberia ratified in 2002). Through this ratification, they are committed to actions related to mitigation of and adaption to climate change.

To help populations meet the challenge of climate variability in recent years and the expected climatic change, the West African states adopted several initiatives, from institutional changes to the promulgation of new policies and laws, through the establishment of projects and programmes.

A review of steps taken at local, national and regional level in West Africa shows that they cover spontaneous responses to deteriorating climatic conditions and planned responses in anticipation of the inevitable adverse impacts of climate change. Many of the actions taken over the past decades have been in response to drought and land degradation, and were undertaken in the framework of the UNCCD. Accordingly, there is a great deal of overlap and synergy between efforts to implement the UNCCD and endeavours to adapt to climate change.

First, countries became more interested in water management and drought control. Often with the support of international institutions, this led to water sector reform processes. Several countries established water codes or laws (eg Senegal in 1981, Burkina Faso in 2001, and Mali in 2002). In addition, after Burkina Faso developed a National Action Plan for Integrated Water Resource Management (IWRM) in 2003, several other states started a similar process. Senegal and Mali are finalising their IWRM plans, whereas Cape Verde and Benin have already completed theirs.

Furthermore, under the UNCCD, almost all of the countries of West Africa have developed strategies and national action plans to control drought and desertification – two issues that are intrinsically related to climate change. Most governments have taken steps to strengthen their departments responsible for meteorology, and to develop capacity to manage information and make short- and long-term forecasts. In addition, many projects and programmes have been implemented to promote the conservation and sustainable use of biodiversity. In particular, many countries have developed national biodiversity action plans, and established national marine and terrestrial protected area systems with potential co-benefits in terms of adaptation to climate change.

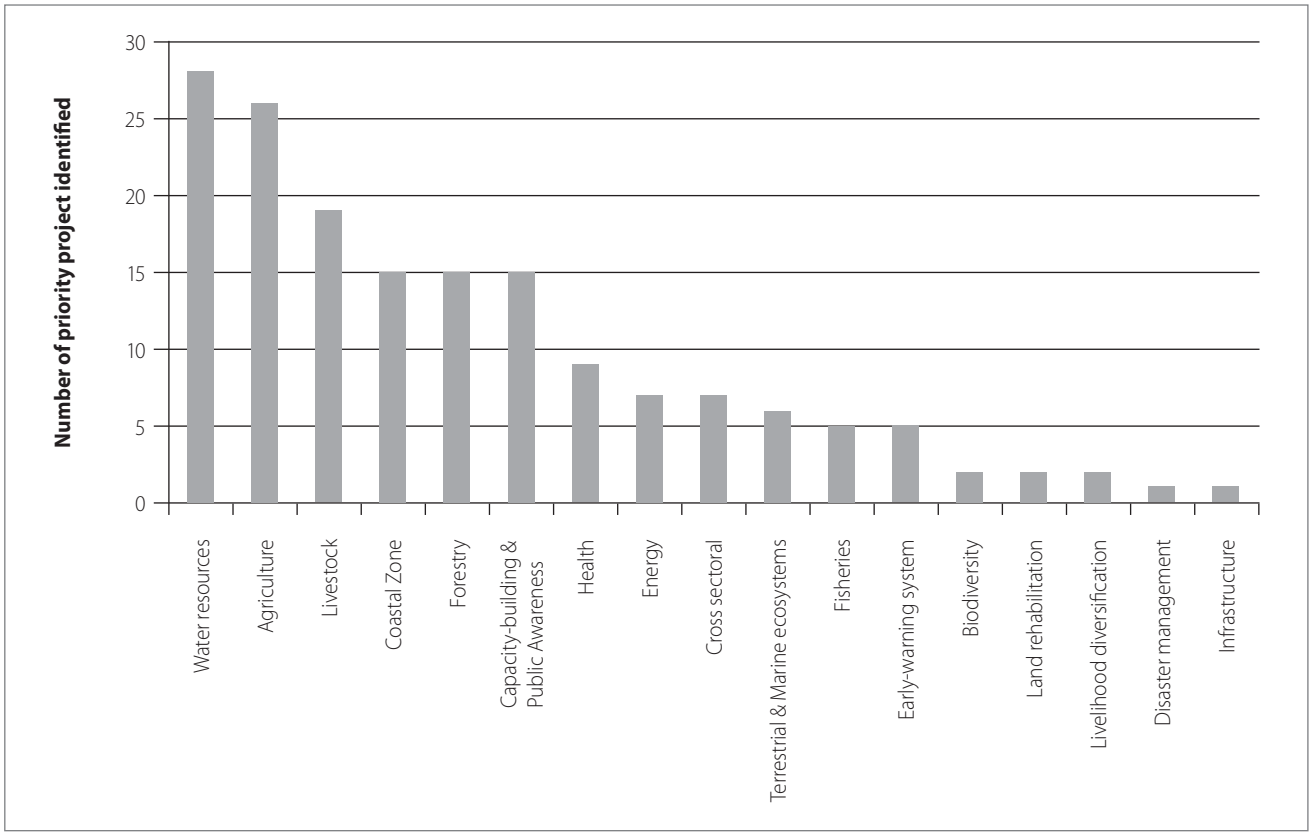
With regards to actions targeting climate change, each country has designated a focal point, and in almost all countries, a national climate change committee has been established. Furthermore, with the exception of Liberia, all West African countries submitted their First NC to the UNFCCC between 1997 and 2007, and many are developing their Second NC. Although the First NCs focus on mitigation of climate change (ie inventories of greenhouse gas emissions and mitigation measures), they provide an analysis of the country's vulnerability to climate change and identify possible adaptation measures. The consultative efforts involved in preparing these reports have played an important role in awareness raising and agenda setting.

Another major initiative is the NAPA (national adaptation programme of action) in the 12 least developed countries (LDCs)[1] of the region. The development of NAPAs aims to strengthen capacities to meet the most urgent needs of climate change adaptation. An ultimate objective of the NAPA development process is to create a cooperative framework to guide the coordination and implementation of national adaptation measures, through a participatory approach, and the creation of synergy between other environmental programmes, to lead to the development of concrete investment programmes and projects, and to strengthen the portfolio of projects eligible for GEF (Global Environment Facility) funding.

The NAPA process led to the identification of priority projects in each country and to the identification of related funding requirements. Figure 6 shows that the largest numbers of priority projects identified by West African LDCs were in the water resource, agriculture and livestock sectors, followed by coastal zone management, forestry and awareness-raising.

The NAPA process has led to the initiation of significant on-the-ground actions to adapt to climate change.

Figure 1 Number of projects identified in the National Adaptation Programmes of Action for West African countries as priority project by sectors



Source UNFCCC. 2008

So far, eight national projects have entered the pipeline of the GEF, addressing needs in agriculture, water resources, early warning systems and coastal zones for a total expected financing of more than US$63 million.

Regional level

At regional level, the actions taken to reduce vulnerability can be divided into three categories:

- Mainstreaming climate change into the work programmes of political organisations
- Developing the capacity of technical institutions to support governments and communities in their adaptation to climate change
- Developing a series of capacity building and adaptation projects and programmes, often with support from the international community

Mainstreaming climate change into the work programmes of political organisations

The main political and economic institutions in the region are ECOWAS, WAEMU, ECA, the Sahel Club, and the transboundary river and lake basin agencies. These organisations are taking steps to mainstream climate change.

In particular, after the International Conference for the Reduction of Vulnerability to Climate Change of Natural, Economic and Social Systems in West Africa, in Burkina Faso in January 2007, these organisations have given increased attention to the issue of adaptation to climate change at the regional level. For instance, climate change and the need for adaptation are highlighted in the environmental policy documents developed in ECOWAS and the WAEMU, both approved in 2008. Moreover, the WAEMU has put in place a legislative framework for a regional programme on biosafety and another on addressing coastal erosion in the WAEMU zone.

Developing the capacity of technical institutions

The creation of CILSS (Permanent Interstate Committee for Drought Control in the Sahel) in 1973 can be considered a landmark regional response to climate variability and the chronic droughts occurring in the Sahelian countries.[2] CILSS is mandated to promote research on food security and desertification. CILSS has three regional programmes in these areas:

- Food security, fight against desertification and population development
- Access to market
- Water resource management

In 2006, ECOWAS requested CILSS to provide support on all environmental issues concerning ECOWAS member countries, including reducing vulnerability to climate change. Thus, its geographical coverage has evolved from the Sahelian countries to the entire West African region, and its technical scope evolved from addressing challenges associated with drought control to include the reduction of vulnerability to climate change. CILSS has two specialised institutions that play an important role in the region:

- The CILSS Regional Centre for Agriculture, Hydrology and Meteorology (AGRHYMET) has the mandate to collect, handle and disseminate information on food security, natural resource management, and the control of water and desertification in the Sahel. AGRHYMET also develops tools to support decision making for population development, technical capacity strengthening through training, and the transfer of tools, methods and knowledge in climatology, agrometeorology, hydrology, vegetal cover protection and remote sensing
- The Sahel Institute (INSAH) has the mandate to promote and facilitate exchanges between national systems involved in research (ie agricultural and population/development) to support dynamic cooperation and suggest actions to sustain productive agriculture and better natural resource management

Another key institution is the African Centre of Meteorological Applications for Development (ACMAD). ACMAD is directly involved in the regional response to climatic disruptions. Its objectives are to produce information for the implementation of policies to reduce vulnerability and improve adaptation to climate change. Since 1992, ACMAD has been working on weather forecasts (PRESAO programme: seasonal forecast for West Africa) for different time scales (ie daily to monthly) and over different geographical scales. It produces weather reports and weather forecasts, particularly on a ten-day and a monthly basis. It also participates in the development of early warning systems, such as for locust control. ACMAD uses Précis software to generate regional climate change scenarios. Finally, ACMAD possesses a databank on climate change and adaptation (ie best practices).

Many other institutions are involved at regional level, playing a direct or indirect role related to the reduction of vulnerability to climate change. In particular, these can be mentioned:

- Scientific and technical institutions such as the Research-Development International Centre for Husbandry in sub-Humid Area (CIRDES); the Sahara and Sahel Observatory (OSS); and the **West Africa Rice** Development Association (WARDA, now known as the Africa Rice Centre)
- Other bodies such as the West Africa **Rural** Foundation (WARF), the Network of Peasant Organizations and Producers in West Africa (ROPPA), and the West African Health Organisation (WAHO).

Developing capacity building, adaptation projects and programmes

Most activities need to be undertaken at local and national level to adequately adapt to climate change. Nevertheless, West African countries share many geographical characteristics and face similar climate risks. This implies that there is a key role for regional level actions and interventions and that certain challenges related to climate change could best be addressed through action at regional level.

In particular, regional-level actions could help to optimise the allocation of scarce resources by avoiding duplication of efforts and by allowing for economies of scale. Moreover, in West Africa, where many countries are unable to act alone, regional interventions are necessary to support actions at national and local level. Regional-level action could facilitate adaptation in the region by:

- Strengthening capacities to address climate change in regional institutes and organisations
- Promoting the adoption of coherent and cost-effective approaches to addressing the vulnerability across countries
- Removing constraints to mainstreaming adaptation into regional level investment programmes in the vulnerable sectors

ROLE OF ECOWAS IN COMBATING AND MANAGING EFFECTS OF CLIMATE CHANGE

ECOWAS recently elaborated its vision for 2020. The ECOWAS 2020 vision is of a region without borders, in which all people have access to and are able to exploit abundant resources, through the creation of opportunities, and within the framework of sustainable production and environment. The vision includes three specific objectives:

- Sustainable development
- Poverty eradication
- Regional peace and security

The region has been making progress in overcoming and reversing the socio-economic challenges and achieving the 2020 vision and objectives. However, climate variability and climate change threaten to undermine and reverse all past advances. Consequently three forces guide the regional action programme: the overall ECOWAS vision (above); implementation of the UNFCCC; and poverty reduction in each country.

- Article 4.1 of the UNFCCC calls on all countries to: Cooperate in preparing for adaptation to the impacts of climate change; develop and elaborate appropriate and integrated plans for coastal zone management, water resources and agriculture, and for the protection and rehabilitation of areas, particularly in Africa, affected by drought and desertification, as well as floods.

In line with these guiding forces, the overall vision of this programme is that the population, economies and governments in the region are constantly and effectively adapting to climate changes. Within the overall vision, this action programme provides a strategic framework that encourages, guides and supports national and locally driven initiatives. It directly supports a number of catalytic investments that will build momentum across the region to addressing climate change, and will build capacity to adapt to it.

The action programme has been designed to build on and draw from the extensive governance framework of policies, action plans and institutions in the region. The governance framework provides the context and overall approach to implementing this action programme. The framework includes regional policies and major initiatives in the environment, water, agriculture and forestry sectors, for example the environmental and agricultural policies of the West African Economic and Monetary Union (WAEMU) and ECOWAS.

The management, the design and the implementation of actions under this programme will be guided by these principles:

- Recognising the importance of good governance and sustainable management of natural resources
- Ensuring close coordination and develop synergies across work plans to implement all environment conventions, particularly the Convention on Biological Diversity and the UNCCD
- Building synergies with the national policy and legislative frameworks related to environmental management and to natural resource management
- Incorporating a participative approach at all levels, especially involving women, youth and marginalised groups
- Respecting and supporting ongoing institutional transformations and adaptation in order to create dynamic synergies and partnerships
- Utilising and contributing to the broad pool of experts, expertise and communication and information technologies in the region
- Supporting increasing efficiency in natural resource management, and generally reducing poverty and increasing the empowerment of the people
- Continually learning lessons and building on previous experience. Lessons will be drawn from the implementation of the Regional Action Plan for Combating Land Degradation and Desertification, from the ECOWAS Common Agricultural Policy (ECOWAP), and from ECOWAS Environmental Policy
- Above all, promoting social equity in and between the countries in the region, especially removing gender disparities

Finally, this action programme recognises the importance of acting coherently and consistently with the continent-wide processes on sustainable development and adaptation, as guided by NEPAD and AMCEN.

The programme's institutional arrangement is based on fulfilling these responsibilities:

- The overall programme benefits from high-level support and from supervision at the regional level and from all countries in the region
- The programme is effectively integrated into existing ECOWAS decision-making structures and dissemination mechanisms
- The programme has effective and operational linkages with national decision-making systems at required levels
- The programme management has strong coordination, communications, partnership building, resource mobilisation and monitoring capacity
- The programme benefits from reputable technical support and supervision
- The programme benefits from a broad consultation and participatory process
- The programme activities have access to high quality expertise in the concerned technical areas
- The programme institutional arrangements and management arrangements are structured, but remain flexible. They respect available resources, but are able to grow as and when the available resources grow

In addition, ECOWAS has developed these policies, which have a direct relationship with climate change:

- Environment Policy plus Action Plan
- Disaster Reduction Policy plus Action Plan

- Agricultural Policy
- Forestry Policy plus Action Plan
- Action Plan to Combat Desertification

The Disaster Reduction Policy for instance focuses on managing disaster risks as a development challenge. It recommends actions in sustainable development aimed at strengthening the regional capacity for disaster risk management and addresses disasters triggered by natural hazards that may be exacerbated by conflict.

In recognition of the relationship between conflicts and climate change and natural resource governance, ECOWAS Conflict Prevention Framework deals extensively with natural resource governance. It outlines 13 responsibilities for ECOWAS, including:

- ECOWAS and members states shall establish transparent mechanisms, such as arbitration panels, for the peaceful resolution of disputes and the clash between local claims, national interest and regional concerns with regard to natural resources.
- With the active involvement of civil society, member states shall undertake to establish community resources governance committees, particularly in sensitive internal enclaves and common border areas, to promote the transparent, equitable and environmentally friendly use of land, water and forest resources, and enhance inter communal harmony.[3]

THE ROLE OF ECOWAS IN MANAGING TRANSBOUNDARY WATER CONFLICTS

ECOWAS's specialised agency, Water Resources Coordination Unit (WRCU), based in Burkina Faso, is principally responsible for managing transboundary water conflicts. With many river basin authorities (Gambia, Senegal, Mano, Niger, Volta, Lake Chad) in the region, WRCU coordinates their activities to ensure that tensions based on the use and management water do not degenerate into conflicts in and between countries. The WRCU's main strategies include direct support and regional integration in the water sector in promotion of ECOWAS Vision 2020.

The issue of water resource management is well covered in the environment policy under natural resources management, which deals with shared transboundary ecosystems, critical watersheds, which sustain the continuous flow of big rivers, among others.

Given the traditional goodwill and support of ECOWAS' heads of state, WRCU has been effective in supporting and coordinating the activities of sub-regional and national actors in the water sector.

Latest development

Lomé Declaration on Climate Change and Protection of Civilians in West Africa:

On 16 September 2009, the Regional Conference on Protection Challenges to Climate Change in West Africa recommended the use of a human rights-based approach to climate change challenges.

The call reflects the adoption of a broader social dimension to the climate change debate, considering the growing negative impact of climate change on West Africa, which affects the stability of the region, including the human security and rights of the citizens. In a declaration, the conference recommended the establishment of a special fund to help address climate change-induced impact on the affected part of the population. In addition, the participants called for measures to protect climate-affected persons, especially women, children and the youth, in order to preserve the full enjoyment of their fundamental human rights.

To ensure better protection of the West African population, the participants agreed that a regional platform should be established for data-based development and information exchange among ECOWAS member states. Furthermore, while recalling the principles and goals of the regional policy and plan of action on disaster risk reduction, as well as the regional action programme to reduce vulnerability to climate change, the participants recommended strengthening the capacity of national and regional stakeholders in the area of humanitarian emergency preparedness and response.

Their concerns are expected to be reflected in Africa's presentation at the 15th United Nations Conference on Climate Change, 7–18 December 2009, in Copenhagen, Denmark.

CONCLUSION

The Regional Action Programme has become ECOWAS's main instrument or framework for managing climate change, including transboundary water concerns or conflicts, in addition to other policies and plans of action. Given the plethora of organisations and actors that are already working on aspects of climate change and water resource management, the Action Programme, the ECOWAS Conflict Prevention Framework, empowers the ECOWAS Commission to coordinate all activities and ensure the building of capacities at national and regional level. The relatively low incidence of open conflicts from transboundary water tensions in West Africa is not due to lack of tensions, but a reflection of the effectiveness of ECOWAS and its specialised and affiliated agencies

in dealing with such tensions. The regional action programme will build on this achievement.

Reasons for hope

Within ECOWAS Commission

- Creation of the Directorate of Environment and Climate Change in 2007 is one of its major responsibilities, and will lead to enhanced capacity to drive the regional agenda
- A closer working relationship with AUC is a major plus; it will further build regional capacity and leverage resources. The theme of the ECOWAS/West Africa project under the African Union AMESD (African Monitoring of Environment for Sustainable Development) project is Water Management for Cropland and Rangeland. ECOWAS's project partner is AGRHYMET Regional Centre
- Intra-commission collaboration within ECOWAS is very high. Issues of climate change and its impacts are dealt with by commissions of environment; agriculture and water resources; political affairs; peace and security; and human development and gender
- Plan for an expanded/integrated early warning system to cover environmental, humanitarian and other potential areas of security threats
- Growing recognition of the connection between climate change, transboundary water conflicts and security and stability
- Vision 2020 of a borderless region is a great motivation

Within the region

- The ongoing process and progress towards political and economic integration
- The progressive ease of communicating, moving and trading across national borders – benefits of the implementation of the ECOWAS Free Movement Protocol
- The existence of common natural resources which constitute the basis of cooperation for their sustainable management
- The many river basin organisations have gained experience in their own technical and geographical domains over the years
- The existence of significant human resources in the region, although there may be a few areas of inadequate expertise
- The long traditional practice of trilateral cooperation between WAEMU, CILSS (an operational technical organisation) and the ECOWAS Commission
- The growing kith and kinship spirit displayed by ECOWAS leaders and demonstrated in collective political will and strong financial backup
- The significant contribution from ECOWAS's own resources that serves as catalyst for external support

Challenges

- Coordination will be very expensive in terms of time, human, material resources
- Limited resources of some countries to act alone
- Unstable climatic conditions, especially recurrent droughts, increased desertification and flooding
- Political instability in some countries, which diverts attention to political affairs

NOTES

1 The 12 West African LDCs that completed their NAPA are Benin, Burkina Faso, Cap Verde, The Gambia, Guinea, Guinea Bissau, Liberia, Mali, Mauritania, Niger, Senegal and Sierra Leone.

2 The nine original member countries of the CILSS were Burkina Faso, Cap Verde, Chad, The Gambia, Guinea Bissau, Mali, Mauritania, Niger and Senegal.

3 ECOWAS launches climate change project, available at http://www.africanews.com/site/ECOWAS_launches_climate_change_project/list_messages/24382, accessed July 2009.

The role and the experiences of CEN-SAD in managing climate change and transboundary water conflicts in the CEN-SAD region

Wafa Essahli
CEN-SAD Director in Charge of Rural Development

INTRODUCTION

La Communauté des Etats Sahélo-Sahariens (Community of Sahel-Saharan States, CEN-SAD) was created by treaty on 4 February 1998. Since June 2008 it has brought together twenty eight member countries from North, West, Central and East Africa.

The community covers an area of more than 15,54 million km^2, which is about 51 per cent of the total surface of Africa. In 2006 its population was estimated at 482 million inhabitants, representing about 53 per cent of the African population. Consequently, it is the most important regional economic community in Africa in terms of gross domestic product (GDP) and consumer market.

The aim of the community is to create a strong and prosperous economic union by putting in place a complementary development plan integrating the agricultural, industrial, energy, social and cultural sectors.

The economies of the majority of the countries in the CEN-SAD region are essentially agricultural, mainly rain-fed subsistence agriculture, which contributes around 20–40 per cent of the gross national product (GNP) and constitutes 70–80 per cent of employment opportunities on limited investment scales. This subsistence agriculture, which is extensive in character and has limited use of inputs, leads to quasi-exclusive exploitation of natural resources that are fragile in nature because of the precarious ecological balance in these environments. Demographic pressure, marked by a growth in population of between 2 per cent and 3 per cent in the vast majority of countries in the zone, even exceeding 3 per cent in some, allied with poorly controlled urbanisation, exacerbates the pressure on the natural resources, which then become even more vulnerable.

The water problem has proved increasingly to be a real challenge at the beginning of the twenty-first century. Its scarcity and lack of management constitute major constraints to the development of the area, which is among the most vulnerable to climate change (OSS, 2006).

In such a context, the creation of a strong economic union is based largely on development of the rural sector and the efficient management of natural resources, particularly the development and efficient exploitation of surface and underground water resources, notably shared in order to reinforce regional integration. This involves a change in developmental paradigms, adding approaches based on dynamics to those based on constraints.

The CEN-SAD strategy of rural development and natural resource management was thought of in this sense, and takes into account the commitments of the countries in various international forums, regional and sub-regional, the achievements of their programmes of action and the various instruments set up to accomplish lasting developmental objectives and of the millennium. It includes four main orientations:

- Promote sustainable agriculture, diversified and regionally integrated, from the perspective of food security and the fight against poverty
- Promote integrated management of water resources for sustainable management of natural resources
- Consolidate actions in the fight against desertification
- Develop a financial partnership and a south-south co-operation involving the main beneficiaries in order to promote actions relevant to helping the development, starting with the real priority needs of the region

The current document presents the initiatives undertaken by the General Secretariat to promote sustainable

management of water resources, in particular in connection with the second task of its strategy, from the point of view of regional integration.

THE CHALLENGES FACED BY THE WATER SUB-SECTOR

Poor exploitation of resources

The CEN-SAD region is characterised by renewable water sources (groundwater and surface) unequally divided between the north and the south of the Sahara. They are estimated at 1 554 billion m^3, representing 29 per cent of the total resources of the African continent[1] and remain mainly underutilised (7 per cent). The sampled areas are dominated by the agricultural sector (86 per cent), where developed and irrigated areas nevertheless represent only about 2 per cent of arable lands utilised in the region. From the point of view of the capacity of resource mobilisation, the sub-Saharan part of the region numbers fewer than two[2] large dams per surface unit of 100 000 km^2, compared with 4,3 in the whole of Africa, 240 in China and 130 in India, all of which reduces the possibilities of exploiting water resources. However, it is reasonable to believe that for the next decades withdrawals will increase, owing to the growth in population in the area and changes in their lifestyle, involving also the need for efficient planning that allows for choices in the development of water resources that integrate the needs of all the actors.

Varied data, but poorly coordinated

Efficient planning of water resources must rest on reliable information, continuous in time and space. Nevertheless, it is often created in a rather limited context (at the level of states, and sometimes of river basins). In fact, development analyses are constrained by weak levels of intervention and the approaches and the tools for tracking the resources remain varied and a function of the status of the actor concerned (state, basin organisation and scientific development organism). To promote an integrated, harmonised vision of water resources in the CEN-SAD region, it is sensible to share methods of collecting information in order to have consensual indicators that are adapted to the needs of management that is relevant to the resource.

Also, the integrated promotion of water resources at regional level requires a broader analysis of the types of resource, according to their uses and needs, in order to identify and promote complementary opportunities and physical and virtual transference of water (CEN-SAD) region-wide. Starting from existing situations, and development initiatives already undertaken by various actors (RECs, intergovernmental development organisations and member countries) in the region, it means integrating all the orientations and adapting them to a development context as comprehensive as that of the community.

Climate changes

Reports by the IPCC and studies led by international and regional organisations attest that climate change represents a major threat to sustained growth and development in Africa, as well as to achieving the Millennium Development Goals (MDGs). Africa is particularly vulnerable to the negative effects of climate change, particularly because its economy is based on the exploitation of natural resources (rain-fed agriculture), wide-spread poverty and lack of capacity to adapt. The effects of climate change result in particular in reduction of agricultural production, deterioration of food security, increased incidence of natural disasters (floods, droughts, etc) spread of disease and risk of conflicts owing to scarcity of land and water). The large areas of pastures are threatened by demographic pressure and by land tenure. The visible effects of these threats include the impoverishment of biological diversity, rapid deterioration of plant cover and depletion of water reserves through the destruction of hydrographical basins and aquifer formations. The evolution of the climate will interact with these underlying changes and will add extra stress to an already damaged environment.[3]

An increased number of people will probably be subject to water stress, and agricultural production, owing to its dependence on climatic conditions, will be strongly compromised by the decreased area of arable land, and length of the growing seasons, while the yield per hectare will compromise even more a food security that is already very fragile.

In January 2007, the countries of the African Union[4] made adaptation to climate change a priority for the continent. They called for increased support for adaptation and for better integration of the risks and approaches related to climate change into African policies, actions, and programmes.[5] In the same time, they are committed to promoting integrated and inter-sectoral management of water resources.

However, efficient policies of adaptation to climate change need observation data and access to this data, which is currently lacking in Africa. Much of the observation network is disappearing, so it is necessary to deepen understanding and improve the modelling of climatic changes connected with the water cycle at levels that are germane to enlightened decision making.[6]

ADVANTAGES OF INTEGRATED MANAGEMENT OF WATER RESOURCES

Interdependence of countries in the region vis-à-vis water resources

The main watercourses (Nile, Niger, Senegal, Gambia, etc) have their sources in well-watered regions, before crossing into the Sahel areas where the rainfall deficit has been chronic since the early 1970s. The hydro-climatic complexity of the basins shows the interdependence of the countries in this area that use these water resources.

The groundwaters also take on an important regional configuration: the Nubian sandstone aquifer system is shared by Egypt, Sudan, Libya and Chad; the North-Western Sahara aquifer system by Algeria, Tunisia and Libya. It is the same for other aquifers in this region.

This situation imposes a unique form of resource management on the actors, based in particular on the integration of needs (hydro-agricultural, hydro-electrical, transportation, drinking water) for every action of development of the resource. This involves a concerted effort among member states and the other actors in the process of planning and managing these resources.

Moreover, the substantial differences from the point of view of water resource potential, degree of mobilisation of these resources and the institutional landscape of its management between the two main sub-groups that constitute CEN-SAD (North and South Sahara) carry the seeds of a complementary and harmonious development that will be exploited efficiently through the creation of propitious conditions of exchange and resource planning within the perspective of regional integration.

Finally, it is fitting to emphasise the advantages constituted by the multitude of scientific development structures (UNESCO, CILSS (Comité permanent Inter-Etats du Lutte contre la Sécheresse du Sahel, or Permanent Interstate Committee for Drought Control in the Sahel), OSS (Observatoire du Sahara et du Sahel), CEDARE (Centre for Development for the Arab Region and Europe), SEMIDE (Système Euro-Méditerranéen d'Information sur les Savoire-Faire Dans le Domaine de l'Eau, or Euro-Mediterranean Regional Programme for Local Water Management)), structures of regional integration (UEMOA (Union Economique et Monétaire Ouest Africaine, or West African Economic and Monetary Union), Communauté Economique des Etats de l'Afrique de l'Ouest, or Economic Community of West African States, ECOWAS), CEEAC (La Commission Economique des Etats d'Afrique Centrale), COMESA (Common Market for East and Southern Africa), UMA (Union du Maghreb Arabe), IGAD (Inter-Governmental Authority on Development) and the African Ministerial Council on Water (AMCOW), whose experiences are worth exploiting for a greater synergy of actions and a better efficacy in developing the water resources.

INTERVENTIONS PRESENT AND FUTURE

Sub-regional cooperation on the integrated management of water resources

Owing to the complexity of the institutional environment of water resource management in the region, CEN-SAD quickly took the initiative to create the conditions for regional cooperation in this question. Thus, it organised technical meetings dedicated to the water sector in November 2006 in Bamako and in October 2007 in Tripoli. As well as member states, scientific, technical and integration organisations participated in these exchanges. This cooperation raised the level of analysis and planning for the two types of water resources (surface and aquifer) and identified perspectives for the exploitation of additional opportunities, including the possibility of physical and virtual transfer of the water at regional level.

Strengthening knowledge of resources for optimised planning: Water resources case study

The case study project aims to contribute to the integrated and harmonised management of water resources in the perspective of regional integration and economic development in the CEN-SAD region. The specific objectives include:

- Develop and analyse exhaustively the state of knowledge of water resources
- Identify development directions and regional integration programmes
- Define the bases for strengthening cooperation among actors on the problem of management of transboundary water resources in the area

At the end of the project these results are expected:

- The information bases on water resources will have been analysed and exploited in a system of information shared by all interested parties in the region (RECs and basin organisations)
- Development directions and programmes for regional integration will be identified. The implementation of these trans-boundary programmes will contribute to the improvement the level of exploitation of the resources, in particular in the sub-Saharan part of the

region, estimated to be under 2 per cent. The agricultural sector at the head of the sampled areas will also be developed in order to satisfy food needs at local level and provide revenue by directing output towards areas with low water capacity for agricultural production. Furthermore, the exploitation of water resources through the development of hydro-electricity will help to improve the lifestyle of the populations and the conditions of industrial progress by making electrical power available and accessible.

- The bases of cooperation between interested parties for monitoring and developing water resources will be defined. Owing to the wide variety of actors involved in monitoring the resources in the area, it is imperative that the methods and tools should be monitored and shared to lead to mutual, better developed guidelines. Also certain follow-up devices, in particular at national level, will be strengthened in order to balance their contribution with the overall system of resource monitoring.

In many of the member countries the actors involved in project implementation are in particular integration organisations (eg CEDEAO, CEEAC, COMESA, UMA, UEMOA and CEEAC; and IGAD), scientific and technical organisations (eg OSS, CILSS, and CEDARE), the organisations of the basins (eg ABN, OMVS, CBLT, Liptako Gourma, OMVG, Nile Basin Initiative, Volta Basin Authority) and the cooperation frameworks of shared aquifer systems (SASS, Nubian Sandstone Lullemenden, Taoudeni Basin).

The budget for the project, estimated at €566 830, is currently being raised.

Investment programmes

Starting with a diagnostic analysis of physical potential and current interventions, additional directions of development and programmes for regional integration will be developed in a context mobilising the CEN-SAD, other RECs and technical and financial partners.

CONCLUSION

Through the implementation of these actions, CEN-SAD aims to strengthen cooperation with all the regional actors (RECs and basin organisations) by offering them space for exchange and cooperation and an opportunity to combine their data, information and tools in order to create a unified, shared vision of integrated management of the water resources, particularly transboundary, across the region. This cooperation among others will ensure the geographical continuity of the area covered by the project, representing almost half of the African continent.

Already several partners have expressed their support and adherence to the project through their RECs, UNESCO, etc, and the mobilisation of the actors and resources must be done in order to allow it to be launched as soon as possible.

NOTES

1 OSS/UNESCO, 2000

2 Atlas of Regional Integration in West Africa, CEDEAO-CSAO/OCDE, August 2006.

3 Special GIEC Report on the Impact of Climate Change in the Region: Evaluation of Vulnerability. Summary for the Decision Makers, November 1997.

4 8th Ordinary Session of the African Union Conference, Addis Ababa, Ethiopia, January 2007.

5 climate changes and Africa, paper presented at the 8th reunion of the Forum for Partnership with Africa, in Berlin, Germany, 22 and 23 May 2007, available at www.forumpartenariatafrique.org

6 Climate Change and Water, Technical Document VI of GIEC, June 2008.

BIBLIOGRAPHY

Burton, Jean. Politique de l'eau, actions collectives et solidaires (The integrated management of water resources by basin). Training Manual IEPF 2001. Available at www.bvsde.paho.org/bvsacd/cd63/131933e/preface.pdf, (accessed April 2009).

CEDEAO-CSAO/OCDE August 2006. Atlas of Regional Integration in West Africa. Available at http://www.oecd.org/document/0/0,3343 (accessed June 2009).

Available at en_2649_37429_38409344_1_1_1_1,00.html (accessed April 2009).

CEN-SAD 2007. Stratégie de développement rural et de gestion des ressources naturelles (Strategy For Rural Development And Natural Resources Management). Available at www.au-ibar.org/documents_public/panspsoInceptionCEN-SAD.pdf, (accessed July 2009).

GIEC. Le Changement Climatique et l'Eau (Climate Change and Water). Technical Document VI June 2008. Available at www.ipcc.ch/pdf/technical-papers/ccw/climate-change-water-fr.pdf (accessed June 2009).

GIEC. Special Report. Incidences de L'évolution du Climat dans les Régions: Évaluation de da Vulnérabilité – Résumé pour les Décideurs (Impact of the Climate Evolution in the Regions: Evaluation of its Vulnerability: Summary for Decision Makers). November 1997. Available at www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm-fr.pdf (accessed July 2009).

OCDE. Les changements climatiques et l'Afrique (Climate change in Africa). Paper presented at 8th Reunion of Forum for Partnership with Africa, in Berlin, Germany, 22 and 23 May 2007. Available at www.forumpartenariatafrique.org (accessed April 2010).

OSS. Mise en place d'une institution de concertation et d'aide à la décision pour une meilleure gestion des ressources en eau de l'espace CEN-SAD (Implementation of an institution for cooperation and decision aid for a better management of the water resources in the CEN-SAD region). Tunis, May 2006. OSS publications available at www.oss-online.org/index.php?option=com...task, accessed (July 2009).

Union Africaine. Rapport de la 8ème Session de la Conférence des Chefs d'Etat (Report of 8th Session of Conference of Heads of State and Government). Addis Ababa, January 2007. Available at www.africa-union.org/.../Conferences/.../Déclarations%20-%208ème%20session%20ordinaire%20de%20la%20Conférence.doc, (accessed July 2009).

Conservation of the forests and ecosystems of Central Africa

Lt. Col Mangondza Godelin Medrad
ECCAS Liaison Officer, African Union, Addis Ababa

Deforestation accounts for about 20 per cent of global carbon emissions. Between 1970 and 2004, direct emissions from land and forest use had already grown by 40%.

To mitigate global warming, the GIEC (Groupe d'experts intergouvernementals sur I'evolution de climat) had recommended reducing emissions caused by deforestation – in particular in sub-Saharan Africa, where the demands of economic development and the combined effects of population growth and worsening poverty exert increasing pressure on forests.

The dense rainforests of the Congo Basin, one of three sets of tropical woodlands of the planet, cover about 204 million hectares. They are spread across six Central African countries, namely the Republic of Gabon, the Republic of Equatorial Guinea, the Central African Republic (CAR), the Republic of Cameroon, the Democratic Republic of Congo (DRC) and the Republic of the Congo.

Since the 1992 Earth Summit in Rio in particular, Africa has become aware of issues concerning the conservation of ecosystems, a message conveyed through pressure from international donors and by civil society. This has had corresponding repercussions in Central Africa, which has the world's second largest tropical rainforest and 70 per cent of the African dense rainforest canopy, in that legal and institutional frameworks have been revised, and structures for coherent action have been established. Consequently, there has been a gradual adoption of tools for planning, management and modern surveillance.

Concerned with protecting the Central African forests from growing deterioration and mindful of the need to work together in a concerted effort towards conservation and sustainable management of forest ecosystems – natural treasures that are important for present and future generations – this momentum saw Central African Heads of State sign the Yaoundé Declaration after the Yaoundé Forest Summit in 1999.

This declaration was supported by the UN, which, through Resolution 54/214 of the General Assembly, had invited the international community to support Central Africa in its implementation of the declarations contained in it.

In 2005, six years afterwards, at the Brazzaville Summit, Central African Heads of State adopted the treaty establishing COMIFAC (Commission des Forêts d'Afrique Centrale), which became the sole political and technical arbiter of guidance and coordination of conservation and sustainable management of forest ecosystems and savannahs in Central Africa.

This legal and binding document committed all states in the sub-region to including conservation and sustainable management of forests and the protection of the environment in their national priorities. Several organs have been set up and sub-regional processes have been implemented.

Figure 1 Central Africa's fauna and flora

COMIFAC is composed of ten states: Burundi, Cameroon, CAR, Congo, DRC, Gabon, Equatorial Guinea, Rwanda, São Tomé and Principe, and Chad. Angola remains an observer for the time being, but since climate change issues affect the entire planet, it could decide to join the organisation in the future.

In 2006 in Libreville Central African Heads of State mandated their ministers responsible for forests and the environment to ensure that COMIFAC was implemented. To put it into operation, the ministers then developed the POPC (Plan d'opérations triennal du Plan de convergence) 2006–2008.

The aim of this plan, which was approved by the international community, was to manage forest ecosystems in a sustainable manner through the rational use of resources and to plan a network of protected areas with a view to preserving biodiversity.

It also set in motion priority actions, among which were the establishment of a system of management and dissemination of data on forest resources, the identification of priority conservation areas, the submission of timber and of other forests assigned to the organisation, the development of a system for certification and traceability of forest products and the fight against fraudulent exploitation and illegal trade in forest products and wildlife. The plan also made provision for increased afforestation and regeneration of timber and non-timber resources, an increase in forest revenues for local people in view of the fight against poverty, and harmonisation of regional forestry policies, legislation and taxation.

POPC envisaged the establishment of capacity-building programmes and mechanisms for financing operations intended to conserve resources, in an attempt to prevent their abuse.

Charged by Central African Heads of State to ensure that the Yaoundé Declaration was complied with, the commission is working in close cooperation with other regional and sub-regional organisations in the fields of conservation and sustainable management of forest ecosystems, with whom it has concluded cooperation agreements pursuant to Article 18 of its constitution treaty. All these institutions were created on the initiative of the states of the region in an attempt to pool their skills and their synergies of action for the benefit of the sub-region and future generations.

Each of these institutions specialises in different areas of intervention for the region, which means that all aspects of environmental conservation and sustainable management of natural resources can be covered. Among others, these institutions are:

- OAB (L'Organisation Africaine du Bois) is an international body of cooperation and consultation in the fields of forestry and timber trade. Its objective is to encourage its member states to study and coordinate their activities, enabling them to better exploit their forest products. OAB brings together 15 member countries of African timber producers. For several years now it has been looking at issues related to forest management and certification, prior to and down the line from its traditional concerns.
- CEFDHAC (La Conférence sur les écosystèmes de forêts denses et humides d'Afrique centrale) is a sub-regional organisation that groups states, national and sub-regional non-governmental organisations (NGOs), the private sector and other stakeholders in the management of Central African forests. It is the only forum where all the players in the forest environment sector can meet, exchange views, develop a shared vision, and form partnerships. It embodies the willingness of stakeholders to achieve a common vision for conservation and for the use of forests in the region, and aims to encourage these players to preserve their forest ecosystems and ensure sustainable and equitable use of the resources they contain.

CEFDHAC has initiated and supports various networks, including REPAR (Réseau des parlementaires pour la gestion durable des écosystèmes forestiers d'Afrique centrale, or Network of Parliamentarians for the Sustainable Management of Central African Forest Ecosystems). The objective of this network is to allow parliamentarians in the region to share their own national legislative experience in managing forest ecosystems, to reflect on common themes, to encourage taking the interests of local communities into consideration when developing legislation on the environment, to contribute to a concerted legislative action in the protection and sustainable management of forest ecosystems in Central Africa, and to sensitise CEFDHAC member states to the need to implement international conventions concerning the environment.

- OCFSA (L'Organisation pour la Conservation de la Faune Sauvage d'Afrique, Organisation for the Conservation of Wildlife in Africa) operates in the field of conservation of wildlife and protected areas.
- ADIE (L'Agence Internationale pour le Développement de l'Information or Agency for Development of Environmental Information) operates in the field of environmental information.
- RAPAC (Réseau des Aires Protégées d'Afrique Centrale or Central Africa Protected Areas Network) deals with the promotion and rehabilitation of protected areas.

COMIFAC also works with international organisations of bilateral and multilateral cooperation, such as NGOs,

private foundations, professional organisations, information, training and research networks, as well as other partners.

In all this, CEEAC (la Commission Economique des Etats d'Afrique Centrale, or Economic Community of Central African States) has the role of coordinating and harmonising the actions of everybody in the region, to ensure coherence of institutional and operational actions in the field. They do this in conjunction with CEMAC (la Communauté Economique et Monétaire d'Afrique Centrale, or Economic and Monetary Community of Central Africa).

To external partners, CEEAC represents the umbrella institution for all environmental and natural resource management actions in the region. Its general policy in terms of its objectives for environmental and natural resource management is to define a general framework for cooperation in matters of the environment and natural resource management among member states of the community. These include:

- Harmonising policies and strategies for sustainable management of the environment and of natural resources in the Central African region
- Promoting cooperation with regional and international organisations concerned with the environment of the Central African region, of other regions of Africa – such as West, North, East and Southern Africa – and of other regions of the world, and institutions of the UN system working in the same field
- Developing the human and institutional capacities of these countries for managing the environment and natural resources by establishing a regional centre or laboratory of excellence in environmental matters
- Adopting a collaborative and convergent approach to major environmental issues in the region, including a legal and institutional framework, management of natural resources, management of urban and industrial environment, management of energy and transportation issues, management of pollution and nuisances, waste management, management of impacts associated with the exploitation of mineral resources, natural disaster risk management, management of consequences and impacts on climate change, etc
- Monitoring the implementation of international conventions.

The member states of CEEAC also agreed to collaborate on the implementation of the strategic issues axes (below) and, after the workshop in Libreville in 2004, on the development of PAE NEPAD (Plan d'Action Environnemental du Nouveau Partenariat pour le Développement de l'Afrique).

These axes of strategic focus were selected as priority intervention themes of the Central African region in the framework of EAP NEPAD:

- Strategic issues axis 1: Fight against land deterioration, drought and desertification
- Strategic issues axis 2: Conservation and sustainable management of wetlands and freshwater resources of Central Africa
- Strategic issues axis 3: Prevention and control of invasive alien species
- Strategic issues axis 4: Conservation and sustainable management of forest resources in Central Africa
- Strategic issues axis 5: Fight against climate change in Central Africa
- Strategic issues axis 6: Conservation and sustainable management of transboundary natural resources of Central Africa (freshwater, marine and coastal biodiversity, fauna and flora)
- Strategic issues axis 7: Capacity building for implementation of international conventions
- Strategic issues axis 8: Population, health and environment
- Strategic issues axis 9: Trade and environment
- Strategic issues axis 10: Transfer of environmentally sustainable technologies
- Strategic issues axis 11: Assessment and early warning for management of natural and induced disasters
- Strategic issues axis 12: Bank of Central African environmental data

After the implementation in the sub-region of the first POPC 2006–2008 had been evaluated, certain observations were made:

- Recognition of the POPC as a tool for mobilising funding, partners, players and others, or its key role at regional and sub-regional cooperation levels
- The sub-documentation of the implementation of the POPC
- The difference in the degree to which the POPC is applied by the institutional partners of CEFDHAC who play a part at sub-regional level

Five years after its establishment, COMIFAC has a number of achievements to its credit, among which are the development of the POPC, the ratification of the treaty on conservation and sustainable management of Central African forest ecosystems, the signing of international conventions on forests and the environment, the establishment of several sub-regional initiatives and thematic groups ('clusters'), the signing of the sub-Regional Accord on Forest Monitoring, adoption of the directive on sustainable

management of PFNL (produits forestiers non ligneux, or non-timber forest products) of plant origin, and others.

The management and collaborative exploitation of this natural resource and many others by the member states of COMIFAC, underpinned by a programme of long-term, coherent and strategic action, is without doubt a factor that not only minimises the risk of conflict between the states but contributes to their development, thereby reducing poverty and ensuring the future of the region.

However, the task of COMIFAC is still immense, particularly with regards to the challenges it faces. Among other things, the commission should:

- Get all member states to sign or ratify all the international conventions and other regional documents, in an attempt to harmonise forest policies in Central Africa
- Ensure that the national planning framework with the POPC is put in place
- Undertake fact-finding missions with higher authorities, in particular the Heads of State and Government of the countries of COMIFAC, in order to put into operation a financial mechanism independent of the commission and its specialised organisations
- Encourage the appropriation of COMIFAC by all member states
- Develop a system for monitoring implementation of planning
- Ensure the organisation of national forums and the creation of centres of excellence for capacity building of member states
- Improve communication about POPC

The Executive Secretariat of COMIFAC recently established a performance-indicator scoreboard linked to a dynamic monitoring database. This performance indicator scoreboard is updated regularly to reflect the state of progress of activities and the development of new initiatives in the sub-region, allowing the Executive Secretariat to ensure efficient monitoring and evaluation of the implementation of POPC.

This performance indicator scoreboard, known as 'Convergence', can track the status of various triennial action plans of POPC and evaluate the performance of the implementation of activities.

But all these policies developed at national and regional level, and thus across Central Africa, may prove ineffective, because the economies of these states are based mainly on the exploitation of natural resources. These policies are based on the principle of balance between the right of countries to extract revenues from the exploitation of forests for their economic and social development and the need to preserve forest resources to help limit environmental deterioration. The current international context, characterised by political instability in certain African countries, by food insecurity, and by the global economic crisis and worsening poverty limits the effectiveness of conservation policies and the sustainable management of ecosystems.

The Act of 10 July 1976 states: 'The protection of natural spaces and landscapes, the preservation of animal and plant species, the maintenance of the biological equilibrium in which they participate, and the protection of natural resources against all causes of deterioration that are threatening them are of general interest.' Yet we cannot separate development and the protection of the environment, because an organic connection unites one with the other within the framework of sustainable development.

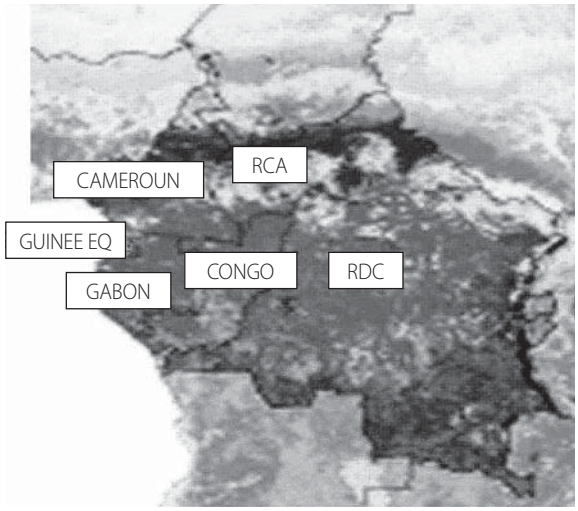
To achieve this, the implementation of international mechanisms for providing compensation to countries that protect their forests to the detriment of their economic imperatives, as well as the economic evaluation of actions of 'avoided deforestation', are proving necessary and urgent, since they are now recognised as a global priority, similar to the development of renewable energies and clean technologies. The rainforests of Central Africa have thus become a universal heritage that should be properly managed and well protected in order to slow global warming.

Before the Copenhagen conference – which deals, inter alia, with issues of REDD (Réduction des Emissions dues à la Déforestation et à la Dégradation des Forêts) – and knowing that discussions on this issue have never been easy, the CEEAC ministers in charge of forest environment and planning and those of COMIFAC met in special session on 14 and 15 October 2009 in Kinshasa, DRC, to adopt a common position among countries of the COMIFAC and ECCAS on the preparation of negotiations on the new climate regime after Kyoto 2012.

In their statement these ministers, aware that the forests of the Congo basin provide environmental services essential to the international community and to humanity, including regulating and stabilising the global climate, urged the parties to incorporate REDD-plus in the agreement to be negotiated in Copenhagen, and the Annex 1 parties to commit to a substantial reduction in greenhouse gas emissions.

They also argued that the REDD-plus mechanisms should integrate the dimension of the fight against poverty through participation in financing development projects for local residents in forest areas. This will help encourage a significant reduction in threats to the forest cover, and they have requested African countries and partners in the Congo Basin to continue their efforts to include REDD-plus mechanisms in the Copenhagen negotiation.

Figure 2 Representation of the forested areas of Central Africa



In conclusion, the international community should continue to support Africa and Central Africa in their efforts by providing various forms of support in the field of conservation and environmental protection, not only to states, but also to regional and sub-regional organisations.

ANNEX 1

Map

Cameroun = Republic of Cameroon
Republic of Gabon
Republic of Equatorial Guinea
RCA = Central African Republic
RDC = Democratic Republic of Congo
Congo = Republic of the Congo

An overview of the responses of the AU, regional economic communities and African governments to climate change and transboundary water conflict in Africa

Jo-Ansie van Wyk
Department of Political Science, University of South Africa (UNISA)

INTRODUCTION

Compared with other continents, African states are by far the most hydrologically interdependent. In the past, shared transboundary water resources (whether they constitute state borders or traverse two or more states) have been a source of militarised interstate conflict and cooperation. Evidence suggests that climate change will be a significant hydro-political driver on the continent as it speeds up the hydrological cycle, resulting in more droughts and floods in affected areas.[1] This influences the function and operation of water infrastructure, such as hydropower, drainage and transboundary water management, which impact on other policy areas such as energy, food and nature conservation.

African governments, the AU and regional economic communities (RECs) have reached consensus on the continental impact of climate change. The AU has acknowledged that 'appropriate mitigation strategies have become indispensable',[2] that climate change, among others, will 'increase water stress and trigger off conflicts and war', and that 'development aspirations are at stake unless urgent steps are taken to address the problem of climate change'.[3]

This paper presents empirical evidence of Africa's hydrological interdependence, and the response of African governments, the AU and RECs to climate change. It identifies several legal, policy and institutional challenges pertaining to climate change and transboundary water, and concludes with some recommendations to address the legal, policy and institutional challenges to the continent's responses to climate change and transboundary water.

HYDROLOGICAL INTERDEPENDENCE AND HYDROPOLITICAL CONFLICTS

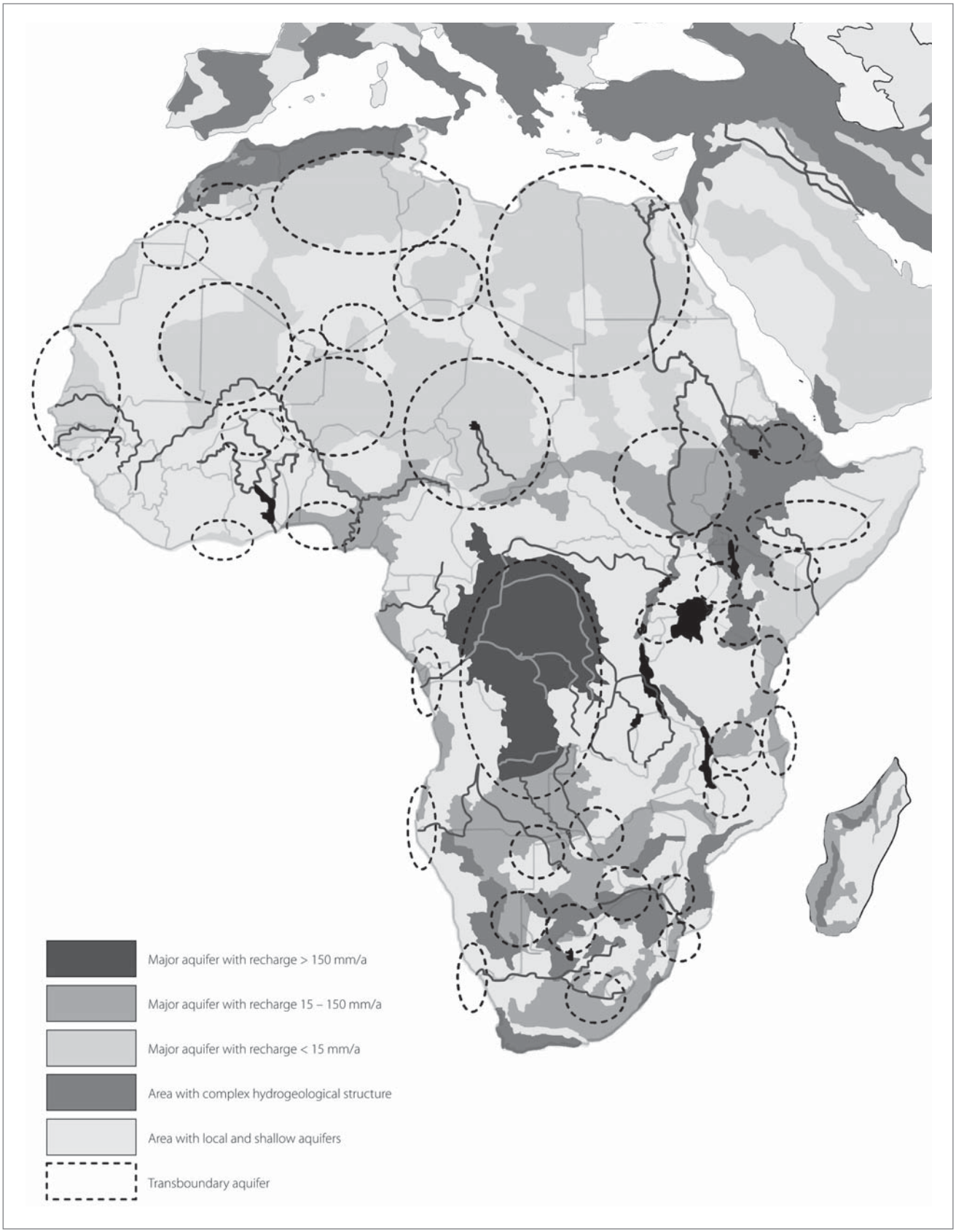
The hydrological interdependence of African states is illustrated in these figures:

- Ninety per cent of all surface water is contained in transboundary river basins.
- Sixty one basins cover almost 66 per cent of the continent, resulting, as figure 1 indicates, in a large number of states sharing large transboundary rivers. More than 75 per cent of the continent's population live in these transboundary river basins.
- A number of states share international lakes, with large populations dependent on these lakes. Almost 30 million people, for example, depend on Lake Victoria, whereas 37 million are dependent on Lake Chad.[5] Africa has 677 lakes, which are increasingly diminishing and deteriorating, adding to socio-economic and political vulnerabilities.[6]
- Figure 2 show a number of transboundary and sub-regional aquifers. The Nubian Sandstone Aquifer, for example, is located in one of the most water-stressed regions and is shared by Chad, Egypt, Libya and Sudan. Other transboundary aquifers include the North-Eastern Mountain Aquifer (Libya, Sudan and Egypt), and the Chad Aquifer (Chad, Niger, Sudan, Central African Republic, Nigeria and Cameroon).[7]
- A number of countries, as table 1 indicates, receive most of their water from external resources, which contributes to their hydrological vulnerability.

Figure 1 Transboundary rivers in Africa

Source UNEP[4]

Figure 2 Transboundary aquifers in Africa



Source Bundesanstalt für Geowissenschaften und Rohstoffe (BGR)[8]

Table 1 African countries that receive most of their water from outside their borders

Countries that receive between 50% and 70% of their water from external sources	Countries that receive more than 70% of their water from external sources
Benin, Chad, Congo, Eritrea, Gambia, Mozambique, Namibia	Botswana, Mauritania, Niger, Egypt

Source UNDP[9]

These hydrological interdependencies, colonial border legacies and the compounding impact of climate change contribute to the continent's hydro-political dynamics. They have caused various types of conflicts,[10] but have also resulted in hydro-political cooperation, and the establishment and maintenance of transboundary water management institutions. The next section addresses the response of governments, the AU and RECs to transboundary hydro-political cooperation in Africa.

RESPONDING TO TRANSBOUNDARY WATER AND THE POSSIBLE IMPACT OF CLIMATE CHANGE

States do not cooperate on transboundary waters because they are compelled to; they collaborate when the net benefits of cooperation are perceived to be greater than the net benefits of non-cooperation, and when the distribution of these net benefits is perceived to be fair.[11] Africa is no exception.

African governments

Less than 10 per cent of Africa's more than 80 transboundary lake and river basins have any kind of basin-wide agreement and institutional arrangement for the integrated development of their natural resources. This is owing to the lack of political commitment, and institutional capacity of basin states and of support from global aid agencies. A number of river basin organisations (RBOs) continue to be adversely affected by political instability and conflict. In some cases, RBO headquarters were physically relocated to other countries.[12] Moreover, bi- and multi-lateral transboundary water agreements tend to neglect the impact of climate change.

Few African states have adopted climate change mitigation policies. Notable exceptions include South Africa, Mozambique, Lesotho, Nigeria, Kenya and Botswana. Predominantly, African states are institutionally too weak to adopt and implement climate change policies. One way of improving institutional response and strength pertaining to transboundary water resources is to comply with international water law (IWL), and develop IWL on the continent. IWL has been consolidated in a number of principles and conventions. The UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes (1992) introduced the precautionary principle[13] and the 'polluter pays' principle.

The first major effort by the UN to codify customary international law for transboundary water resources was the Convention on the Law of Non-Navigational Uses of International Watercourses, which took 27 years to draft and was adopted by the General Assembly in 1997.[14] Subsequently, the Berlin Rules on Water Resources (2004) departed from the Helsinki Rules on the Uses of the Waters of International Rivers (1966) and the 1997 convention in that it obliged each state to manage water in an equitable and reasonable manner, which goes beyond the right to use/utilisation of water. The subsequent Seoul Rules on International Groundwaters (1986) included the equitable use and management of transboundary aquifers that do not contribute to, or receive water from, surface waters of an international drainage basin.[15]

Despite these legal provisions, there is still no universal treaty in force to regulate the use and protection of transboundary water to promote harmonious practices of water management among upstream and downstream co-riparians to prevent the unilateral abuse and the eruption of conflicts. By 2009, there are only 16 signatories and 17 parties to the 1997 Convention on the Non-Navigational

Table 2 Status of the United Nations Watercourse Convention in Africa

State	Signature	Ratification	Accession
Côte d'Ivoire	25/9/1998		
Libya			14/6/2005
Namibia	19/5/2000	29/8/2001	
South Africa	13/8/1997	26/10/1998	
Tunisia	19/5/2000	22/4/2009	

Source International Water Law Project[16]

Uses of International Watercourses. Table 2 indicates that as of November 2009 only five African countries had signed, ratified or acceded to the convention.

Evidently, most states are not ready to commit themselves to a binding legal obligation of this nature, resulting in a situation where nearly 60 per cent (153 of 263) of international rivers and lake basins still lack agreement. However, this has not precluded the development of IWL and cooperation between sovereign African states; nor does it imply that the principles are not broadly accepted. African states have a large body of transboundary water law, which, at least on paper, regulates the relations between states involved. However, Africa's 12 complex river basins are shared by four or more states, and only 34 treaties regulate their use.[17] Moreover, to rein in hydrological hegemony, which determines the distribution and collaboration, some choose to engage in multilateral or unilateral transboundary water interaction and are also able to determine the outcome of this interaction, either for unilateral gain or the collective good. Hydro-hegemon Egypt, for example, engages in out-of-basin transfers.

African Union

Continentally, the AU's water agenda emerged in the 1990s as separate from its environmental agenda. The AU has addressed transboundary water issues and conflicts at various meetings. One example is the 1996 OAU Resolution on International Humanitarian Law, Water and Armed Conflicts in Africa subsequent to an OAU/ICRC seminar on 'Water and Armed Conflict'. More recently, the AU expressed its concern 'about the reduction in available water resources, the humanitarian problems resulting therefrom and the increasing use of water as a weapon in armed conflict'.[18] The establishment of the New Partnership for Africa's Development (NEPAD) provided new impetus for the AU's water agenda. For example, its Water Resources Planning and Management in the Nile River Basin project is funded by the EU, and it is developing a project on the SADC Shared Watercourse Systems undertaking. It is expanding studies in transboundary water resources on the Niger, Senegal, Congo, Chad, Okavango, Zambezi and Nile Basins, including aquifers and national and regional water security.[19]

The AU Commission has also been involved in federating river and lake basin authorities under the aegis of the African Network of Basin Organisations (ANBO). It has developed policy and institutional framework guidelines with regard to cooperation for sustainable management of transboundary water basins. The Guidelines for the Establishment of Cooperative Framework Agreement for the Integrated Management of Transboundary Basins have been developed and disseminated to member states of the AU.[20]

The 2007 AU Summit adopted a decision on climate change which resulted in the development of the Climate for Development in Africa Programme (ClimDevAfrica) as a mitigation strategy to minimise the impact of climate change.[21] In July 2008, Egypt – a downstream state – hosted the AU Summit on Water and Sanitation. The summit confirmed its commitment to improving water and sanitation goals, to implementing the 2008 eThekwini Ministerial Declaration on Sanitation, and to addressing water security issues. Specific commitments included developing and updating national water management policies and national strategies and action plans; building institutional and human resource capacity; increasing the domestic financial resources allocated for implementing national and regional water and sanitation development activities; improving donor involvement; and strengthening the African Ministers' Council on Water (AMCOW). AMCOW is a regional institution that promotes cooperation on water and sanitation and is involved in strengthening relations within and between the RECs and river and lake basin organisations (RLBOs) in order to implement the AU Sirte Declaration on Agriculture and Water.[22]

In July 2009, the AU established the Conference of African Heads of State and Government on Climate Change (CAHOSCC), which will be the only African delegation at international meetings on climate change. CAHOSCC[23] adopted the Nairobi Declaration, the AU's common position on climate change. For the AU, 'despite contributing virtually nothing to global warming, Africa has been one of the primary victims of its consequences', and therefore the global carbon trading mechanisms that are expected to emerge from international negotiations on climate change 'should give Africa an opportunity to demand and get compensation for the damage to its economy caused by global warming'. For the AU, these decisions 'signify a fundamental shift in the collective policy and practice of African States towards international negotiations on climate change'.[24]

Regional economic communities

The 2008 AU Summit on Water and Sanitation requested regional economic communities (RECs) and RLBOS to initiate regional dialogues on climate change and its impact on the water sector in order to design appropriate adaptation measures.[25] In regions where RECs have taken the responsibility for addressing transboundary water resources, the potential for conflict is reduced. Key regional transboundary water agreements include:

- African Convention on the Conservation of Nature and Natural Resources (Maputo Convention 2003)
- Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa 1991
- Convention for Cooperation in the Protection and Development of the Marine and Coastal Environment of the West and Central African Regions (Abidjan Convention 1981)
- Brazzaville Declaration and Decisions on Water and Sanitation in Africa 1996

RECs have been very active in addressing climate change issues.However, RECs and individual states have yet to harmonise their response to climate change with that of the AU. Improved regional cooperation and policy coordination will mitigate hydro-political conflicts. More importantly, increased cooperation is likely to lead to the internalisation of shared norms, and the creation of a regional identity and regional interests. Consequently, cooperation becomes routine and the threat and use of violence reduce considerably.

CONCLUSION AND RECOMMENDATIONS

The AU, states and RECs have acknowledged – but insufficiently addressed – the potential of transboundary hydro-political conflict, which can be compounded by climate change. Legal, policy and institutional challenges persist. These challenges converge on two aspects: the need to strength organisations such as government institutions, RECs and the AU in order to mitigate the effect of climate change; and the need for comprehensive research on government policies, and those of RLBOs, RECs, and the AU. Strong institutions and their cooperation will enhance climate security and regulate the equitable and reasonable utilisation of transboundary water.

In conclusion, some recommendations are presented to address these challenges:

- Inter-institutional research and the dissemination of its results are required.
- The AU should address transboundary water resources as part of peace processes. Successive AU summits have neglected this matter, despite its inclusion in a UN General Assembly (UNGA) resolution on the protection of transboundary water in time of armed conflict.[26]
- The continent's handling of its multitude of transboundary aquifers is insufficient. As access to water becomes restricted, transboundary aquifer systems will increasingly become triggers of conflict.[27] The boundaries of international aquifers and groundwater are poorly known. The Helsinki Rules provides that each basin state is entitled to a reasonable and equitable share in the beneficial use of the waters, but obliges all states to prevent new forms of pollution that could cause injury in the territory of other basin states. The Helsinki Rules include groundwater in their definition of an international drainage basin. However, most of the joint commissions established for the management of transboundary water resources focus primarily on surface water and there are no formal agreements on sharing and managing transboundary aquifers.[28] Libya's Great Man-Made River Project, which draws fossil water from the Nubian Sandstone Aquifer, excludes other aquifer states, and has only data-sharing arrangements on the aquifer.[29] This is in contrast with the UNGA resolution on the sovereign equality and equal utilisation of transboundary aquifers.[30]
- Institutional challenges impede the ability to effectively address transboundary water issues and conflicts. The AU, government institutions and RECs are institutionally too weak or politically too uncommitted to move beyond statements and policy documents in order to develop and implement effective transboundary water units. This is partly because of different water policies, and varying levels of development and degrees of regional integration.
- The AU and RECs lack an early warning system on transboundary water issues and conflicts. The problem-solving and conflict-resolution capacity of the AU and RECs are determined by the institutional setting, the distribution of power among the actors, and the skills and energy available. The AU's and RECs' capacities are insufficient. This is illustrated by the fact that states opt to take their disputes to the International Court of Justice (ICJ) rather than the AU or water-related tribunals in RBOs and RECs. In 2005, for example, in the frontier dispute between Niger and Benin to determine the course of the boundary between countries on the Niger River (in which states own islands), these states referred to the ICJ. Namibia and Botswana also opted to take their dispute to the ICJ.
- A final challenge relates to multilateral transboundary agreements such as the Inga project on the Congo River. It has been beset with institutional problems which resulted in the withdrawal of Westcor and Eskom, two major investors in the project. Here, the DRC acted as a hydro-hegemon which has effectively terminated the hydro-electrical potential of some parts of the continent in exchange for its own interests.
- African states should ratify the 1997 UN Convention, update existing agreements and enter into agreements where these are lacking.

NOTES

1 IPCC (Intergovernmental Panel on Climate Change), Summary for policymakers. Working Group II Fourth Assessment Report, Geneva: IPCC Secretariat, 2007.

2 A Konare, Statement by the chairperson of the Commission of the African Union on the Occasion of the 6th Anniversary of Africa Environment Day, 3 March 2008, available at http://www.africa-union.org, accessed 28 August 2009.

3 J Ping, Opening statement by the chairperson of the African Union Commission at the meeting of the Representatives of the Conference of African Heads of State and Government of Climate Change (CAHOSCC) and African Lead Experts on Climate Change, Addis Ababa, Ethiopia, 24 August 2009, available at http://www.africa-union.org, accessed 28 August 2009.

4 UNEP, *Atlas of international freshwater agreements,* Nairobi: UNEP, 2002, 27.

5 UNDP, *Human Development Report 2006. Beyond scarcity: power, poverty and the global water crises,* New York: Palgrave Macmillan, 2006.

6 *Mail & Guardian Online,* Uganda 'pulling the plug' on Lake Victoria, 9 February 2006, available at http://www.mg.co.za, accessed 9 February 2006.

7 GCI (Green Cross International), *National sovereignty and international watercourses,* Geneva: GCI, 2000.

8 Bundesanstalt für Geowissenschaften und Rohstoffe (BGR), Policy Advice Groundwater – Resources and Management, 2006, available at http://www.bgr.bund.de/nn_327800/EN/Themen/TZ/Projekte/Laufend/Sektorvorhaben__Ueberregional/ueberregional__politikberatung__grundwasser__en.html, accessed 19 October 2009.

9 UNDP, *Human Development Report 2006. Beyond scarcity: power, poverty and the global water crises,* New York: Palgrave Macmillan, 2006, 210.

10 D J H Phillips, M Daoudy, M Öjendal et al, *Trans-boundary water cooperation as a tool for conflict prevention and for broader benefit-sharing.* Stockholm: Ministry for Foreign Affairs, 2006; P Gleick, Water conflict chronology, Pacific Institute, November 2008, available at http://www.worldwater.org/chronology.html, accessed 31 August 2009.

11 D Grey, C Sadoff and G Connors, Effective cooperation on transboundary waters: A practical perspective, in A Jägerskog and M Zeitoun (eds), *Getting transboundary water right: Theory and practice for effective cooperation,* Report No 25, Stockholm: Stockholm International Water Institute (SIWI) 2009.

12 UNECA, *Transboundary river/lake basin water development in Africa: Prospects, problems, and achievements,* Addis Ababa: UNECA, 2000

13 All parties should take appropriate measures to prevent, control and significantly reduce any adverse effect on the environment emanating from a change in the conditions of transboundary waters caused by human activity.

14 G Eckstein, Tunisia ratifies 1997 Watercourse Convention, International Water Law Project Blog, 17 May 2009, available from http://internationalwaterlaw.org/blog/?p=135, accessed 31 August 2009.

15 S M A Salman, The Helsinki Rules, the UN Watercourses Convention and the Berlin Rules: Perspectives on International Water Law, *Water Resources Development* 23(4) (2008), 635–639.

16 International Water Law Project 2009. Status of the Watercourse Convention, 15 May, available at http://www.waterlaw.org/documents/intldocs/watercourse_status.html, accessed 31 August 2009.

17 H Elver, International environmental law, water and the future, *Third World Quarterly* 27(5) (2008), 885–901.

18 OAU, Resolutions adopted by the Sixty-Forth Ordinary Session, Yaoundé, Cameroon, 1–5 July 1996, available at http://www.africa-union.org, accessed 28 August 2009.

19 International participation to manage Africa's water, *Engineering News,* 8 June 2007, available at http://www.engineeringnews.co.za, accessed 28 August 2009.

20 Konare, Statement by the chairperson of the Commission of the African Union on the Occasion of the 6th Anniversary of Africa Environment Day.

21 Ibid.

22 O Brown, and A Crawford 2008, Climate change: A new threat to stability in West Africa? Evidence from Ghana and Burkina Faso, *African Security Review* 17(3), 39–57.

23 It comprises the chairpersons of the AU, the African Ministerial Conference on Environment, AU Commission; Ethiopia; Algeria; Congo; Kenya; Mauritius; Mozambique; Nigeria; Uganda; and member states' climate change technical negotiators.

24 Ping, Opening statement by the chairperson of the African Union Commission at the meeting of the representatives of the CAHOSCC.

25 AU, Summit adopts commitments for accelerating the achievement of water and sanitation goals in Africa, AUC News 21, June 2008, available at http://www.africa-union.org, accessed 28 August 2009.

26 UNGA, Resolution adopted by the General Assembly, The Law of Transboundary Aquifers, 15 January 2009, available from http://www.un.org, accessed 2 September 2009.

27 Phillips et al, *Trans-boundary water cooperation as a tool for conflict prevention.*

28 P Pallas, Transboundary aquifers: Scientific and hydrological aspects, in B Appelgren (ed), *Managing shared aquifer resources in Africa,* Paris: UNESCO, 2004, 41–46.

29 Eckstein, Tunisia ratifies 1997 Watercourse Convention.

30 UNGA, Resolution adopted by the General Assembly, The Law of Transboundary Aquifers.

The challenges of climate change and transboundary resources in Eastern Africa

Ambassador Idule-Amoko
Deputy Head of Mission, Embassy of Uganda, Addis Ababa

INTRODUCTION

Today, one of the greatest challenges confronting humankind is climate change. Unfortunately, because of its scientific sophistry and complexity, the phenomenon is scarcely grasped, let alone appreciated, by ordinary citizens. This has clouded their awareness and driven their governments from the fringes of inaction to fight the impending menace. This is true in developing countries generally, and Africa in particular, which bear the brunt of the adverse consequences of climate change. Thanks to the concerted efforts of environmental activists, the matter has at last been placed on the global agenda and has captured the attention of the world's highest statesmen and women.

United Nations Secretary-General Ban Ki-moon has sounded the alarm bell and is the trail-blazer of the global struggle against this imminent catastrophe. Addressing a world climate conference in Geneva early in September 2009, he said that: 'The world faces many daunting challenges today, one of the greatest of which is how to feed a growing population in the context of climate change.'[1]

Ban Ki-moon appealed to world leaders for the urgent conclusion of a new climate treaty to fend off economic disaster with a surge in sea levels of up to two metres by 2100.

> We will pay a high price if we do not act. Our foot is stuck on the accelerator and we are heading towards an abyss.[2]

Meanwhile the UN has just released a report that says developing countries need US$600 billion dollars support annually to tackle climate change with support from rich nations on a scale that has not seen outside wartime recovery. It will cost between US$500 and US$600 billion annually for the next 10 years to allow developing nations to grow, using new and renewable energy resources, instead of relying on dirty fuels that worsen global warming.

One of the immediate calamities of climate change and global warming is ice water. Glaciers in the Arctic, Antarctica and the world's highest mountain tops will melt, including those on Kilimanjaro, Rwenzori and Elgon in East Africa. Coastal lands will be inundated. Rising sea levels will threaten livelihoods and the environment in coastal areas, affecting populations, human health, infrastructure, fisheries, biodiversity and tourism. Storms will raise floods, leading to deaths, massive displacements and water-borne diseases.

By then Mombasa, Pemba, Zanzibar and the entire East African coastal islands will have disappeared from the map of the earth. Those who flee to Kisumu will have nowhere to settle owing to over-population. Agricultural and industrial production will have crumbled owing to crises in power generation and irregular rainfall and weather patterns. Poverty and disease will reign supreme. Africa's lakes and rivers may not be spared either.

According to the UN Panel of Experts on Climate Change, the phenomena will impact adversely on Africa's freshwater resources. By 2020, between 75 and 250 million people are projected to be exposed to increased water stress owing to climate change. By 2020, in some countries, yields from rain-fed agriculture could be reduced by up to 50%, leading to low food production and food insecurity, thus exacerbating malnutrition. Towards the end of the 21st century, projected sea level rise will affect low-lying coastal areas with large populations. The cost of adaptation could amount to at least 5–10% of GDP. By 2080, an increase of 5–8% of arid and

semi-arid land in Africa is projected under a range of climate scenarios.

The UN has identified nine river basins in Africa that are at risk of tension or conflict. These include the Kunene, Okavango, Zambezi, Limpopo, Orange, Nile, Niger and Volta. Together these basins form approximately half the total area of Africa.

It may be of interest for this gathering to ponder and raise two or more issues for consideration before mapping out a plan of action at the end of our deliberations. One, is climate change cause of conflict? Two, can climate change trigger conflict? Three, would such conflicts necessitate exclusive policy, legal and institutional frameworks for their resolution? Where scarcity of water and land arises, competition between and within countries, as well as among communities, becomes so intense that conflict is a great possibility and, indeed, it does occur because of the need for agricultural and industrial production, animal grazing and human consumption. We may need to take a cue from reputable bodies such as the International Crisis Group, who had this to offer on this subject:

> The security implications of climate change are attracting increased attention, and for good reason … The potential consequences of these changes and of environmental degradation associated with them are grave … Yet the relationship between climate and conflict is complex and not yet sufficiently understood … A key challenge today is to better understand the relationship between climate change, environmental degradation and conflict and to effectively manage associated risks through appropriate conflict prevention and resolution mechanisms.[3]

Policy, legal and institutional challenges related to climate change

Most governments and the public, particularly in Africa, are not much aware, let alone keen, on issues related to climate change. Because of its sophistication, the subject is too esoteric for the populace to digest and absorb. This has serious governance implications. Some pertinent questions come to mind. Are there national, regional or global priorities over climate change in riparian states? How are national responses to climate change reviewed and followed by riparian states? There is a need to translate global environmental policy into national policies of riparian states for them to be implemented. In Uganda, for example, the UN Framework Convention on Climate Change (1992), the Kyoto Protocol to the UN Framework Convention on Climate Change (1997) and the Montreal Protocol on Substances that Deplete the Ozone Layer (1989) are executed under the lead agency of the Department of Meteorology. But otherwise all environment-related matters are now under the umbrella of the National Environment Management Authority (NEMA). But environment issues have yet to be mainstreamed in all sectors of government's socio-economic activities, particularly trans-border resources. A government draft national land policy just released states that:

> Uganda is ready to establish a framework for the management of trans-boundary and shared natural resources. It will i) undertake voluntary abatement measures in respect of anthropogenic activities which would upset the ecology of L.ake Victoria and the Nile Basin and ii) negotiate mechanisms for co-ordination and benefit sharing of the Lake resources of Lake Victoria and Nile Basin.[4]

The draft admits that Uganda needs to harmonise and develop a national framework policy on climate change. It states:

> Uganda, along with the rest of the international community, is thus expected to take climate change considerations into account in its social, economic and environmental policy. This will require policy convergence within the region.[5]

Needless to state, under the National Environment Act, Chapter 153/Part VII/34 of Uganda, nobody is allowed to 'divert or block any river from its normal course; drain any lake or river'.[6]

Most, if not all, of the Nile Basin states are donor dependent for their development budgets. They are heavily reliant on external funding for their development needs. Naturally, there are bound to be conflicts between national and global environmental priorities. There is a tendency to prioritise mitigation over adaptation, which is more important to developing countries than the developed countries But 'he who pays the piper calls the tune', says the English adage! Second, there is no systematic coordination on climate change among stakeholders, namely governments, business, NGOs, CSOs and CBOs. Third, communication mechanisms, to ensure information sharing among stakeholders are fragmented and information is difficult to access. Fourth, the role of business and NGOs in formulating climate and environment policy is marginal because priority is given to donor interventions and government activities. Last, the formulation of a national environment climate policy and its integration into existing poverty and development-oriented planning and budgeting frameworks is yet to be firmly formalised and institutionalised. Hence there is urgency to integrate climate change matters in national schemes and priorities and fully own them.

Policy, legal and institutional challenges related to transboundary resources

Africa is endowed with about 80 of the world's 200 transboundary river and lake basins. Together they constitute about two-thirds of Africa's total land mass. They carry large volumes of fresh water. They have rich and diverse ecosystems. Creatively and effectively utilised, the resources in these water basins could adequately address the continent's agricultural, industrial and other socio-economic problems.

With or without climate change, Africa must use and share its trans-border resources collectively, equitably and profitably for the benefit of its present and future generations. It is by due recognition and acceptance of this responsibility that cooperation can be enhanced and inter-state tension and conflict averted. All that Africa requires is a policy, legal and institutional framework within national, regional and continent-wide mechanisms to develop transboundary resources.

Fortunately Africa is on the right track. There are already some well-established lake/river basin authorities and commissions in Africa, including Senegal, Niger and Volta. They hold huge dams that generate power for industrial and agricultural production. They also contribute to integrated water planning, development and management plus environment management.

Cross-border resource exploration and exploitation are powerful tools for continental and regional integration; economic development and social progress; transport and communication; cultural integration; and conflict prevention, management and resolution.

However, river and lake basins can be a source of tension and conflict because of the complicated environmental, demographic, diplomatic, historical and geopolitical heat they generate. The Nile Basin is one such region. There could have been opportunities for the realisation of a legal and institutional framework for the effective basin-wide development in the context of the Nile Basin Initiative, but political and legal considerations have bogged down the negotiations. Thus the world's longest river faces a myriad of challenges:

- Lack of comprehensive legal and administrative machinery for the effective management of its resources
- Insufficient data on the water resources by most of the riparian states except perhaps Egypt and the Sudan
- The geo-politics of the basin
- The large number of national borders that traverse the basin
- The possible emergence of a new independent state within the basin
- The varied levels of industrial and agricultural development of the basin states
- Mutual suspicion among riparian states
- Apparent non-impartial role of key partners in the negotiation process for a conclusive and final basin agreement
- Until recently, support to rebel groups by states

The biggest of these challenges relates to water for production, namely power generation, industrial and agricultural production to support rapidly increasing populations in riparian states that must be sustained through adequate food security. The populations of upstream states have generally been peasants who rely on rainwater to eke a living through the primordial system of production. However, over the years the character and nature of the populations have metamorphosed and are gradually transforming, and with that too, the mode of production. Hence from the simple hoe, through animal traction and now the tractor, the modern upstream river farmers' demands for water are rising. Whereas now there may be positive interaction between technology, development and knowledge, this synthesis collides with nature and climate change. Therefore, to appreciate fully the dynamics of the Nile Basin, one has to grasp the political economy of each riparian state.

Uganda has a rising middle class that wants to modernise its agriculture. To do so it can no longer depend on rainwater alone, but must move towards irrigation, for which it should logically and naturally draw water from its abundant river and lake basins. Uganda's population growth rate is 3.4% per annum. The government has a bounden duty to feed its people, keep them healthy, and educate them. Indeed, this is the duty of every reasonable and credible government to its people. This, of course, is bound to upset the status quo of inequity, whereby the 1959 Agreement between Egypt and the UK gave exclusive rights to Egypt (and to a lesser extent Sudan) to utilise the Nile waters. A new mutually agreed relationship based on justice and equity will have to be peacefully negotiated among all concerned states without resort to force or blackmail. We definitely do not contemplate recourse to military option. It would seem inconceivable and unsustainable, and even more so deplorable.

Uganda, like other up-stream basin states, is a victim of year-to-year extreme climate variations of droughts and the El Niño phenomenon, over which it has no control. It has been observed that the snow on Mt Rwenzori is melting fast. Between 1991 and 2000 Uganda experienced seven droughts in a period of 10 years, compared with eight droughts recorded over the 80-year period between 1911 and 1990. The levels of Uganda's rivers and lakes rise and fall at the mercy of nature. One needs to recall the floods of the 1960s which swelled Uganda's waters to the extent that all the piers and infrastructures along the

River Nile were submerged and rendered economically redundant and useless up-to-date. The steamer services between Uganda and the southern Sudanese town of Nimule, which were running a booming business**,** and trade collapsed, never to be revived. I have yet to hear of compensation for this natural calamity from any quarter! To add insult to injury, Uganda was recently accused of over-using Lake Victoria's waters for generating power! Yet the region knows too well that Uganda load-sheds power daily owing to its insufficiency. But the problem is far wider than that. At one time Ugandan members of parliament urged government to sell the country's water resources in exchange for barrels of oil to downstream riparian states. And as recently as 12 December 2008, *East African Forum*[7] reported that a Kenyan MP, Ekuwe Ethuro, who represents Turkana central constituency, had recommending that his government threaten war against Ethiopia for damming the Omo River, which feeds into Lake Turkana. Domestic demands of this type that can fuel tension into possible resource conflicts in a common water basin. Admittedly a steady progress towards the inter-connectivity of power grid within the Eastern and Equatorial Nile regions is progressing well. This kind of concrete and positive move towards the integration process by a number of African countries should be acknowledged, encouraged and commended.

TRANSBOUNDARY RESOURCES AND CONFLICT RESOLUTION MECHANISMS

Because of their sensitivities, matters of borders need extreme care in handling. One reason is that the arbitrary borders inherited from colonial times often divide ethnic groups. Some may even trace their origins to the same lineages and chieftainships. Therefore, when tension flares up over grazing land at the common border, the immediate recourse to settlement of disputes and redress is the elders' council, because of the massive reverence they command from their communities and followers. But some border problems are becoming too complex to deal with casually. Take the recent crisis that erupted over the tiny islands in Lake Albert and Lake Victoria, involving the fishermen of Uganda, DRC and Kenya on two separate occasions. Another nasty incident occurred early this month at the Uganda-Sudan border when some armed men, believed to be errant Sudan People's Liberation Army (SPLA) soldiers, crossed into Moyo District of Uganda, evicted farmers from plots they claimed were in Sudanese territory, and destroyed their crops! The underlying causes of these border quarrels are land, water, fisheries and oil resources in unmarked or disputed common borders. (The oil resources are found under Lake Albert and its subsoil.) Ideally such disputes should have been referred to a river basin organisation or a regional body such as the East African Community (EAC). But it was decided to establish a technical group of surveyors, composed from Kenya and Uganda, who would use old colonial maps and modern scientific means to determine where the borders are precisely located. The real aim was to keep away politicians who would always wish to capitalise on such events for their own ends. Second, such a dispute could be dealt with under bilateral agreements. The DRC and Uganda have already signed one or two such agreements to specifically facilitate joint oil exploration ventures in the Lake Albert region. The third option for dispute resolution is recourse to the joint permanent commissions established by Uganda with almost all the riparian states, except Ethiopia. However, a draft agreement is ready for signing between our two sisterly countries Ethiopia and Uganda. Fourth are the regular consultative border meetings between senior government officials. But what perhaps is the best and welcomed is the AU initiative for the effective and final demarcation of African borders, which should sound a death knell to this recurrent odyssey.

CONCLUSION

Africa is plagued with violence, conflicts, poverty and disease. It is abused as a dumping ground for dangerous chemicals by transnational corporations of developed countries. Invasive alien plant species, such as the water hyacinth, are introduced by outsiders to choke our rivers and lakes. Peace and security elude the continent, yet these are basic conditions for sustained development, protection of the environment and sound economic development. Africa pollutes least, yet is the greatest victim of environmental pollution and degradation. Every problem in Africa is a priority that defies choices. To handle them, Africa needs flexible and mature statesmanship, imbued with prudence and sobriety. To conclude, I wish to quote Jean Ping, the African Union Commission chairperson, who captured the matter under discussion graphically in his report to the AU Special Summit on Africa's Conflicts in Libya:

As we strive to achieve our objective of a peaceful Africa within a peaceful world, a new threat, relating to climate change is clouding our horizon. Changing weather patterns and rising sea levels will surely bring environmental stress to large parts of our continent. Although Africa has contributed least to global warming, we are, because of our limited resources and capacity, likely to suffer the most from the resulting consequences, whether they relate to scarce water resources, damage to coastal infrastructure and cities, reduced agricultural yields and environmentally-induced migration. While we

are yet to deepen our understanding of the interaction between climate change and conflict, it is clear that this phenomenon will impact negatively on our quest for peace and further compound the efforts being made in this respect.[8]

NOTES

1 Climate Change: UN Secretary-General Ban Ki-moon, *Reuters,* Thursday 3 September 2009.

2 Ibid.

3 *Climate change and conflict*, International Crisis Group, briefing paper, updated August 2008, 1.

4 Drafting The National Land Policy, Ministry of Lands, Housing And Urban Development, para 157, 62, January 2007.

5 Ibid, para 160, 63.

6 National Environment Act (19 May 1995), cap 153, part VII, 34 (f & g).

7 Kenyan MP recommends threatening war on Ethiopia for damming river, *East Africa Forum*, 11 December 2008.

8 Enhancing Africa's resolve and effectiveness in ending conflict and sustaining peace, doc SP/Assembly/PS/RPT (1) para26, 5.

Natural resource scarcity and pastoral conflict in Africa under climate change

Wario R Adano
Max Planck Institute for Social Anthropology, Halle/Saale, Germany /School of Environmental Studies, Moi University, Eldoret, Kenya

INTRODUCTION

The problem of ethnic conflicts and violent raids in the Horn of Africa in the past decades has been blamed mainly on increases in populations, ecological stress and a dwindling resource-base, and the resulting competing claims over scarce natural resources. There is also a great deal of debate supported by the growing empirical foundation of the effects of adverse climate change on natural ecosystems and human systems. There is consensus that effects of changing climate on pastoralist communities are negative, and worsening. These issues collectively are likely to have adverse consequences for pastoral communities and their livestock-based production system and shared communal rangelands.

Though the precarious ecological and economic position of pastoralists is a fact, the claim that natural resource scarcity induces conflicts has to be tested empirically. An interesting question is to what extent can pastoral peoples fight over resources they lack or of which they have very little? This paper looks at empirical data for the association of resource scarcity and conflicts among pastoralists in the Horn of Africa region. Second, it argues for the relevance that such results might have for responses that aim at rooting out the causes of the problem.

THE CONTEXT: PASTORAL COMMUNITIES AND THEIR KEY RESOURCES

Pastoralists by definition are mobile, which entails erratic movements of people with their livestock. The practices of mobility and migration are essential if pastoralists are to survive in arid areas. Nomadic pastoralism is the most dominant viable way of life in the region, because arable agriculture is feasible only in pockets of highland areas. On this note, pastoral communities are set apart from other populations by certain common characteristics which more generally provide the context within which pastoral issues have to be considered.

First, pastoralists by definition derive a substantial proportion of their livelihoods from livestock, and share communal rangeland resources. The rangelands are in turn influenced by erratic rainfall that considerably varies between and within years. These rainfall patterns have direct implications for livestock mobility and for the land-to-livestock ratio, or grazing pressures of the rangelands. Second, in the arid pastoral areas the production potential of livestock and the rangeland resources are low because of rainfall patterns and low amounts of precipitation. In addition, livestock accumulation (and restocking efforts) is stated as a major cause for incidents of conflicts during periods of drought: a time of greatly diminished availability of the key rangeland and pastoralists resources.

Rainfall is generally minimal in Africa's dry lands. It fluctuates greatly in time and space in terms of inter-annual and short-term seasonal variations. As a result of such environmental influences, the pastoral areas constitute harsh and difficult environments that are prone to high risks. The per capita livestock wealth of pastoral households has declined over the years owing to droughts. Today, pastoralists rank high in terms of poverty levels and score poorly when assessed on social welfare indicators such as education level, maternal health and nutritional status among children less than five years. Pastoralists also frequently face basic security problems, and inter-ethnic conflicts that are often attributed to competition for or blocked access to scarce natural resources, and ecological stress. Many scholars and policy makers view the incidences of pastoral conflicts as a 'usual traditional-cum-cultural phenomenon' or merely brush

them aside. Such perceptions have, unfortunately, tended to misinform the public view and shaped responses to the problem negatively.

PASTORAL CONFLICTS IN THE HORN

Summed up briefly, certain main broad arguments about violent pastoral conflicts and raiding practices are presented. First, severe droughts and outbreaks of animal diseases occur regularly in the dry land pastoral areas. These adverse factors cause considerable livestock wealth differentiation between households and between ethnic groups. The need to rebuild or accumulate herds after periods of heavy livestock losses to droughts is presented as a strong motivation of inter-ethnic raids and violent pastoral conflicts. This argument is convincing and logically consistent. This way of reasoning states that periods after droughts will show increased inter-ethnic raids, because many livestock deaths during droughts will lead to a greater incentive to re-stock through raiding ethnic others. The key argument is built on the common belief that herd accumulation, for whatever cause and reasons, is one of the most important driving forces of pastoral conflict. Raiding is argued to constitute a vehicle for climbing out of herd poverty and for gaining a culturally endorsed social status. The region's increased frequency and intensity of droughts in the past decades and associated heavy livestock losses are suggested to have increased inter-ethnic conflicts and incidents of human killing in the recent past, compared with the distant past.

Second, the pastoral system is based on a flexible property rights regime; negotiable access to key rangeland resources; and herd mobility that optimises production by rearing diverse livestock species and exploiting the varied patchiness of rangelands. The system is based on a principle of herd mobility that transcends national borders. Studies have consistently shown that pastoralists lose dry season fallback grazing areas because of other land uses and a decline in per capita livestock wealth in pastoral areas. The creation of legally protected areas and national boundaries tends to disadvantage the pastoral strategic and opportunistic use of rangeland resources. The reduction of herd mobility owing to restrictive policies results in rangeland degradation, which is followed by increased livestock deaths while human populations are growing. The low per capita wealth of pastoral households naturally challenges human needs obtained from livestock, puts pastoral life at a critical point, and raises doubts about the survivability of pastoralism. Thus, geopolitics becomes a factor in environmental conflicts and a cause of environmental insecurity across border lands as political powers define territories and physical boundaries that hinder herd mobility.

Water is the single most important resource in the dry lands in the Horn of Africa, especially during dry seasons. Water sources and their surrounding rangelands are of immense value to the pastoral peoples. Thus, the connection between availability of water resources and the pastoral way of life is an obvious one. The pastoral communities are able to survive by digging shallow wells, some very deep wells and deep boreholes mounted with diesel driven motors. Coping and living with water scarcity is normal and a daily life experience. Over centuries the local elders have perfected skills to negotiate the use of shared communal resources such as wells (water sources) and pastures. But despite these, there is the usual assertion that pastoralists fight over scarce resources such as water and grazing land. This is scarcely an accurate claim in instances where these resources had nothing to do with conflicts. Yet, political instigation is entirely to blame. There is need for closer investigations into those people who incite others to fight, those who engage in conflict and those who benefit from conflicts among pastoral communities and use the scarcity of water to fuel the conflict.

To date, empirical works on the problem of ethnic conflicts and violent raids in Africa have tended to rely on a few incidences of conflicts, making any claim weak in its approach and raising serious questions about the validity of the evidence. Among other issues, the trend in incidences of pastoral conflicts has yet to be understood, and a better analysis of the underlying causes of the problem is needed. Ethnic frictions and conflicts are non-trivial issues in the Horn of Africa.[1] Incidences of pastoral conflicts are common, but attributable to a number of factors besides scarcity of natural resources, and their reasons need to be disaggregated. This paper draws on the results of a case study from northern Kenya, which is home to over a dozen groups from several distinct ethnic backgrounds. The region's arid area is inhabited almost exclusively by pastoral communities, including the Pokot, Turkana, Gabra, Rendille, Boran, Samburu, Dassanetch and Somalis of several clans.

CLIMATE CHANGE, SCARCITY OF NATURAL RESOURCES AND PASTORAL CONFLICTS

The Horn of Africa, with particular reference to pastoral areas, is described as a region of continuous and endemic security problems of cattle-rustling raids and political instability. The main tenets of violent conflicts between pastoral communities are usually seen to be adverse events such as climate, disease epidemics and ecological stress. However, today almost all the claims about inter-ethnic conflicts being a result of natural resources scarcity

have been based on analysis of only limited incidents. Empirical evidence for the scarcity of natural resources inducing pastoral conflicts is quite limited.[2]

Pastoral conflicts are linked to and influenced by a combination of factors that complicate the problem, and challenge the understanding of the causal factors and their interaction effects. Adano and Witsenburg (2004) embarked on a thorough historical study of all reported cases of violence since the early 20th century in the Marsabit District in Northern Kenya. The aim was to better understand the problem of pastoral conflict. This study was set to investigate long-term trends of inter-ethnic conflicts and empirically test the relationships between resource scarcity and violent conflicts among pastoralist populations in the northern region of Kenya. The key research questions were: Have inter-ethnic raids and incidences of violent conflicts increased with the downward trends in rainfall and substantial decline in livestock wealth in per capita terms? And, do conflicts occur mainly during and after droughts, and during dry seasons? The study considered seasonality and general long-term trends of the association between natural resources and inter-ethnic conflicts. This approach was inspired by the fact that the problem of inter-ethnic conflicts can be addressed with regard to resource availability (with rainfall amounts indicating the level of availability of range resources), and dynamic changes in livestock wealth.

The study found a negative correlation between violent conflicts and drought, as well as immediate post drought periods, although those are the periods when scarcity is experienced most, and which show most livelihood tensions in pastoral communities. There are clear indications that violent incidences occur much more often in rainy seasons and during relatively good years than in dry seasons and during droughts. Further, the evidence shows twice as many persons are likely to be killed in a violent conflict during relatively rainy years (that is, in a time of relative resource abundance) than in the drought years. This result also reflected herders' viewpoints and explanations. They see droughts as difficult times when animals are weak, survival in dry lands is hard, and people are more inclined to stop fighting, patch up their differences, renegotiate access rules and rights, and reconcile in order to cooperate. In other words, when survival becomes difficult – as it does during droughts – people decide to defer raids until an appropriate time in future. During the rainy seasons animals are in good body condition and strong enough to withstand long-distance treks, manpower demand is low, rain probably washes away tracks, and there is rich vegetation cover. Individually or in combination, these factors enable raiding and increase the prospects of successful raiding.

In addition, when changes in incidences of conflicts are normalised by human populations in per capita terms to allow comparison of individual incidents over time (that is, specific conflict incidents are divided by the corresponding human population), there is no evidence that more violence is occurring now than in the past. Moreover, it was asked whether previous drought years (and high livestock death) were associated with conflicts in the subsequent years. Here, again, no evidence was found that devastating droughts were likely to be related to more violent conflicts or raids in subsequent years without drought, or with above-average rainfall. Therefore, the evidence from the inter-ethnic conflicts suggests that the validity of the claim that the scarcity of natural resources causes conflicts among pastoralists is not supported. This could mean that the claim that pastoral conflicts are induced by the scarcity of natural resources may not hold always true, but where and why these conflicts occur remain intriguing questions. This evidence shifts to the question why pastoralists may not fight over resources they do not have or have in short supply, thus hinting at instances of human cooperation in the face of growing scarcity of key resources.

Few concrete studies investigate the complex relationships between scarcity of resources and pastoral conflicts under the effect of climate change. In this case, climate change refers to the long-term or permanent change of the mean precipitation and temperature. Climate variability is known to be extreme in Africa. Changes in climatic conditions are likely to bring vulnerability to the livelihoods of pastoral populations. But it is probably an exaggeration that 'pastoralists in the Horn of Africa are likely to be the *first* people wiped out by climate change'.[3] There is not a single pastoral or ethnic group that so far has entirely been, or is on the verge of being rendered extinct because of climate change. Such expressions may appeal more strongly to the moral basis of reactive aid than development initiatives in pastoral areas.

The issues of the relationships between resource scarcity and pastoral conflicts are likely to continue to be at the core of the development agenda. The aim should be to investigate a multitude of factors behind inter-ethnic tensions and conflicts, and to broaden the scope of the investigation of pastoral conflicts and related issues. So far, statistical relationships between scarcity of environmental resources and their links to the nature of pastoral conflicts are limited. For example, since sub-Saharan Africa is more vulnerable than any other region to climate-induced water scarcity, Africa should now be on the frontline of climate change.

The lack of convincing evidence suggests the need for a new, innovative approach to dealing with conflict in pastoral areas and its concomitant issues in the future.

Such an approach entails the categorisation of causes of conflicts among pastoralists into indicators, intensity measurements and analysis of changes in incidence, to ascertain the trend in underlying causes of conflict. If adopted, the approach gives an opportunity to understand for example the significance of the role of ethnicity or natural resources in pastoral conflicts. Again, the viewpoint from which incidents of pastoral conflicts are looked at matters. Which factors best explain why at times warring pastoral groups form alliances against others and share resources, but break up at other times to become foes, only to regroup later as allies?

Governance concerns and conflict resolution relate to changes in institutions of raids and conflicts as they were carried out in the distant past compared with how they were executed in the more recent past. The dynamics of local institutions of conflicts that fuel inter-ethnic hatred and violence can be taken into account by using ethnic differences and age-categories (for example local elders and the youth). Factors such as changes in the legal systems, economy and age-set, and politics over natural and state resources constitute intervening variables. These variables are equally central to unearthing causes of, and thus mitigating, conflicts in pastoral areas. Taken together, these issues are instrumental in providing insights into the nature and intensity of ethnic rivalry between pastoral peoples, and require attention in future for intervention efforts. Conflict resolution and peace-building strategies between contentious pastoral groups in the Horn should aim at easing tensions and avoiding conflict.

CONCLUDING REMARKS

In the Horn of Africa's pastoral areas, recurring severe droughts that result in diminished livestock populations, deteriorating ecological conditions, and constrained access to rangeland resources are often seen to be interlocked with cycles of raids and livestock rustling.

The widely held claim is that inter-ethnic pastoral conflicts are motivated mostly by declining per capita livestock wealth (or wealth differentiation between groups) or induced by scarcity of natural or environmental resources. Yet, only a few thorough empirical foundations on the relationships between natural resources scarcity and pastoral conflicts have been based on long-term time-series data.

The continued conflict problems among pastoralists are blamed on growing competition over natural resources. Weak community-level institutions and reduced power of the local elders for mediating differences between pastoral communities and resolving conflicts are also blamed. In the absence of a framework to broker peace that evolves from the local peoples' peace-building processes and committed choices of conflict avoidance and mitigation, options for finding an enduring solution are as difficult as they are costly. However, the causes of conflicts in pastoral areas may not easily be understood according to micro-macro-level categories. Neither can motives of conflicts be combined into a single factor across groups or over time. Nor can the problem be isolated from today's global issues.

It seems a reasonable guess to explain the frequent occurrence of violent conflicts that take place without prior warning as the failure of local institutions in building peace. It also seems plausible to assert that pastoral conflicts recur unabatedly owing to inefficiencies ingrained in the judicial system considering challenges many African countries face, and poor enforcement of the rule of law. One thing is apparent. The role of 'formal politics' and the behaviour of local politicians in election-related violent conflicts, by manipulating ethnicity and emphasising politics of difference for electoral gains are emerging concerns. The behaviour of 'practising raiders' in terms of how violent conflicts of whatever cause are conceived, meticulously planned, and fought out is difficult to understand, but extremely important. The landscape of pastoral conflicts changes in an unpredictable way, which is making responses more difficult and research into the realities of these conflicts more compelling.

NOTES

1 The author's ongoing research compares incidents of conflicts among pastoralists in the north- and north-western regions of Kenya. This research notes incidences of conflicts with the adjacent groups across the Ethiopian and Sudanese borders.

2 See P Meier, D Bond, and J Bond, Environmental influences on pastoral conflict in the Horn of Africa, *Political Geography* 26 (2006), 716–735; W R Adano, and K Witsenburg, Surviving pastoral decline: Pastoral sedentarisation, natural resource management and livelihood diversification in the Marsabit District, PhD thesis, University of Amsterdam, 2004; K Witsenburg and W R Adano, Of rain and raids: Violent livestock raiding in Northern Kenya (forthcoming).

3 Adano and Witsenburg, Surviving pastoral decline.

4 Christian Aid, *Life on the edge of climate change: The plight of pastoralists in northern Kenya,* London: Christian Aid 2006, 3.

Session IV

Climate change and natural resource conflicts in Africa

Natural resource conflicts in West Africa

The case of the Niger River Basin

Lulsegged Abebe
International Alert, London

INTRODUCTION

Although water covers 71 per cent of the earth's surface, only 2,5 per cent is fresh and two thirds are inaccessible glacier. Water is a scarce resource that is unevenly distributed among peoples and states. Food, economy and human securities are dependent on water security. Lack of sound water management strategy can instigate conflict, especially over transboundary watercourses and in countries where conflicts are imminent, owing to other factors. Use of water can become contentious between upstream and downstream users as pollution and use can diminish water supply and quality for downstream users.

Global water consumption doubles every 20 years because of population increase, agricultural and hydropower development, industrialisation, urbanisation and lifestyle changes. Continuous increase in demand does not match dwindling supply, especially in arid and semi-arid regions of Africa. According to the United Nation's World Water Development Report, by 2050 about 7 billion people in 60 countries will suffer from water scarcity.[1] Sub-Saharan Africa, where flooding, drought and unreliable and changing patterns of rainfall are persistent, is hit hard. It is estimated that 25 per cent of Africa, approximately 200 million people, currently experiences water stress, with more countries expected to face high risk in the future. The impacts of climate change are likely to add to this water stress, with ramifications for availability, accessibility, supply and demand. This may lead to increased food and water insecurity and undermine growth, triggering or escalating conflict if a good governance system is not in place,

The paper will assess issues related to water security in light of climate change in Africa with special focus on the management of water in the Niger River Basin; identify conflict mitigating factors; and provide policy recommendations.

CLIMATE CHANGE AND WATER SECURITY

Water is undoubtedly at the heart of the climate change debate, with the principal risks largely water-related: sea-level rise; and increased frequency and intensity of extreme climate events such as storms, flooding, heatwaves and droughts. Climate change will significantly affect fresh water supply. In its Fourth Assessment Report, the Intergovernmental Panel on Climate Change (IPCC) stated that, 'Observational records and climate projections provide abundant evidence that freshwater resources are vulnerable and have the potential to be strongly impacted by climate change, with wide-ranging consequences for human societies and ecosystems.'[2] In addition, increased temperatures will have severe implications for the quantity and quality of water resources available as evaporation increases.

Critical challenges lie ahead in coping with progressive water shortages and water pollution. Worldwide, over 430 million people currently face water scarcity. This is set to increase owing to the fast-growing demand for water and population growth. Further, the IPCC predicts these numbers will rise sharply as surface water resources sustained by rainfall and glacial melting are affected. Recent estimates suggest climate change will account for 20 per cent of the increase in global water scarcity.[3] By the middle of this century, water scarcity will affect between 2 billion people in 48 countries and 7 billion in 60 countries.

Of the 47 nations that are categorised as water stressed or water scarce in 2007, 25 are regarded as facing a high risk of armed conflict or political stability as a

consequence of climate change.[4] The linkages between climate change and conflict are diverse and complex. Climate change is best understood as a threat multiplier. Climate change can compound existing pressures on water, food, energy, land, which, if not carefully governed, may create new and accelerated paths to conflict. To understand these risks, it is critical to look beyond merely the physical impacts of climate change and understand the role of governance and resource management. In West Africa, a key problem is poor water management that wastes and politicises water, seeking a scapegoat to blame for shortages.

For water resources that are shared among several countries, conflicting claims to these resources have not generally led to violence between states,[5] as the cost of war has been judged high, compared with the value of water.[6] However, there remains a considerable risk of conflict within states as different groups contend for diminishing resources, contributing to the fragility of state institutions. The possibility of 'water wars' between riparian nations has often been mooted, but is unlikely in the short to medium term. The focus has shifted to threats of increased stresses triggered by water-based disputes leading to localised violent conflict.

Africa's fresh water resources are vital to the support of agriculture and fisheries-based livelihoods, food security and power generation in particular, and to meeting domestic and industrial needs. Most rural Africans are directly dependent on surface water for their water supply. A possible increase in the variability of rainfall and river flows and changes to the geographical distribution of water resources has physical effects and social consequences such as migration. Ninety per cent of Africa's freshwater resources are in river basins shared between two or more countries with competing national interests and limited mechanisms for cooperation or adaptation. This can pose particular problems that climate change may exacerbate.[7]

Cross-border cooperation will be required. In most countries that face the double-headed problem of climate change and violent conflict, governments are severely challenged to provide the necessary policy framework and adequate implementation to promote adaptation and cooperation, lacking will and/or capacity. Given the weakness of state institutions and potential for conflict within states, a peacebuilding approach is needed. 'Peace building' means that societies equip themselves to manage conflicts without resorting to violence. The approach looks different in different contexts – the detailed activities range from local dialogues promoting reconciliation to advocacy that shapes economic policy and business practices. Thus, such a peacebuilding approach to water cooperation should engage communities and governments to work out how to adapt to climate change thereby attenuating climate change and conflict risks.

CLIMATE CHANGE IMPACTS IN THE NIGER RIVER BASIN

The Niger River basin is one of 11 African international river basins that are more than 250 000 km^2, more than half of which are approaching or already under situations of water stress at basin level.[8] The third longest river in Africa after the Nile and Congo, the Niger River is a spinal column for the economy of West Africa. Although the whole basin covers five further countries, the Niger River and its main tributaries traverse only Guinea, Mali, Niger and Nigeria, rising in the highlands of Guinea and flowing into the Gulf of Guinea when it reaches the Niger Delta. The riparian nations are 'river-dependent economies', and changes in river flow have significant impacts on the livelihoods of the estimated 100 million people reliant on navigation, fisheries, irrigation, hydropower, and municipal and environmental uses.

Dependency of the riparian countries varies with location. Mali, Niger, and to a lesser extent Nigeria, comprise large portions of the basin and rely heavily on the Niger for water. Benin, Cameroon and Guinea comprise only 14 per cent of basin land area, but provide more than 80 per cent of the waters. Burkina Faso, Chad and Côte d'Ivoire are the least dependent on the Niger for water, but would benefit from inclusive management of basin resources. The Niger River also constitutes an important economic driver for surrounding non-basin countries, which rely on products and are connected by trade and migration routes.

The basin's population is expected to double to 200 million by 2020. Poverty, stressed water resources, and environmental degradation threaten rural livelihoods and continue to drive urbanisation. Coupled with water crisis, a vicious circle has formed that is hindering development. Water resources are central to economic growth, poverty alleviation, and sustainable livelihoods. Even though water is abundant, there is seasonal variability, influenced by climate change. This variability forces rural communities – including farmers and cattle herders – to migrate south to more humid conditions, increasing pressure on remaining floodplains and wetlands. Traditional resource management has given way to survival needs that are ecologically unsustainable and lead to declining biodiversity and productivity of natural habitats.

Studies indicate that average temperatures will increase in West Africa by between 1.8° C and 4.7° C until 2080. Projections of change in average annual rainfall are

less certain and range from a 9 per cent decrease to a 13 per cent increase for the same time period, depending on the climate model.[9] The eastern parts of the Niger basin are more likely to experience increases in runoff, while the western parts may experience declines.[10] In addition to changes in average temperatures and rainfall, there is likely to be an increase in extreme climate events such as floods and droughts, which will combine with expected increases in demand for water resources.

Already, the combination of average 3 per cent human population growth per year, unsustainable resource use and desertification is threatening the river's ability to support its currently rich biodiversity and provide resources to communities. River flows in the basin are decreasing as fishing pressure is increasing, leading to a drastic decline in fishing productivity. The environment is also being degraded because of low flows; sedimentation of river beds directly related to deforestation and over-farming of fragile soils; industrial and household pollution; and loss of arable and pasture lands. Economic implications for the basin's future development are significant.

KNOCK-ON CONSEQUENCES OF CLIMATE IMPACTS IN THE NIGER BASIN

Climate change and food security

Food production in the Niger Basin is heavily dependent on rain, so rain variability has a great deal of negative effect. Unlike other African regions, where irrigation, improved seeds, chemical fertilisers and pesticides, and the use of machinery have increased yields, most farmers are subsistence farmers, so neither technology nor irrigation is used widely. The IPCC reports that agricultural production will reduce by up to 20 percent by 2020 due to rises in temperature. The 2008 Global Hunger Index found West Africa to have the most severe hunger in the world.[11] Climate variability and change will continue to impact abilities of local residents to grow enough food to feed their families.[12] The potential for riots, as witnessed with the increase in rice prices in 2008, is evident.

Competition over scarce water resources is increasingly a source of tension. Drought and reduced water availability have forced rural communities, notably farming and cattle-herding families, to migrate south to more humid conditions, increasing pressure on the remaining depleted floodplains, wetlands and arable land. In some localities, traditional resource management, under pressure from migration, has given way to ecologically unsustainable survival strategies that are leading to declining biodiversity and productivity of natural habitats. The ensuing intensity of competition has already caused localised conflict in semi-arid zones. There are signs of disputes taking place on ethnic dimensions as hardships are blamed by indigenous groups on 'outsiders', rather than affected communities seeing their difficulties as shared 'conflicts of interests'. Flooding events are perhaps given less prominence than drought in the Niger basin, but do occur and have serious impacts on human security.[13] The implications of flooding events for conflict are not well documented.

The impact of dams on the Niger River

With the exception of Nigeria, most dams are used for energy production rather than irrigation. For example, the Kandadji dam in Niger, when completed in 2013, will be a large multipurpose dam, funded by the Islamic Development Bank and the OPEC Development Fund. The dam is designed as part of a hydroelectric generation complex and will control the flow of the Niger River, holding water in the dry season to maintain a minimum flow and making downstream irrigation possible.

Dams transform the landscape, the watersheds and aquatic ecosystem, creating irreversible impacts. Although stressing the green credentials of the electricity produced, most countries do not conduct assessment of social and environmental impact. Assessment is limited, indirect impact is not considered, or there are no indications of stakeholder involvement.[14] Moreover, donors such as China and the Arab financial institutions are not serious about the assessments. Further, although many who live in the big cities benefit from increased electricity provision, the construction and operation of dams have led to many significant negative social and human impacts on the livelihoods of local peoples. According to a World Commission report, the construction of large dams has led to the displacement of 40 to 80 million people worldwide.[15]

THE CHALLENGE: 'WATER WARS', 'WATER RIOTS' OR 'WATER DISPUTES'

The unfolding scenario for water use in the Niger Basin is one of increasing concern about access, equity and the response to growing needs. This affects relations between:

- Rural and urban populations
- Upstream and downstream users
- Agriculture, industry and domestic sectors
- Human needs versus the needs of a healthy environment

With the current rate of population growth, water consumption could increase sixfold between 2000 and

2025 because additional food production and industrial development are required for improved living conditions and progress towards the Millennium Development Goals (MDGs). Changes in water quantity and quality owing to climate change will affect food availability, stability, access and utilisation, subsequently leading to increased vulnerability of poor rural farmers who live in arid and semiarid tropical Africa. As water continues to become scare and unevenly distributed, when groups start to disturb river flow, water will become contentious, especially in sub-Saharan Africa where there is high population growth.

Although there are indigenous methods of settling disputes among pastoralists, fishing communities and small-scale farmers that are triggered because of water usage and access to grazing and irrigated land, there are huge discrepancies in ways in which to address issues related to water. Despite tension and disputes among communities, no violence has been reported, especially that may lead to interstate 'water wars'. According to a study, 'with one exception (now almost 4 500 years old) there has not been a war fought over water'.[16] However, water riots are already happening among farmers in China, Ethiopia, Egypt and Central America. Add to the mix historical tensions, marginalisation and a proliferation of small arms and there is potential for escalation.

Certain factors can create stress on water resources:

- *Population increase*: Africa has the highest rate of population increase, which will be matched by an increase in food and water consumption, creating tension over already scarce resources.
- *Migration to rural to urban and rural to rural*: *Owing to population increase, and lack of* employment opportunities in rural Africa, most people move to slums surrounding towns in search of employment where the water supply system is already stretched and high loss of water experienced owing to poor infrastructure.

Much movement in the Sahel is also predicted to be rural to rural. In this case, those moving may find their new location is just as water stressed as their previous one. In such a situation, the host community may resent the newcomers whom they perceive to be jeopardising their resources, which are only just viable.

- *Development and industrialisation*: Construction of dams for generating power and irrigation has contributed greatly to displacement of people, deforestation, and flooding. These dams have become breeding place for mosquitoes and other water-borne diseases and increase rather than reduce poverty. Electricity generated by the dams does not reach rural populations: four out of five people in rural sub-Saharan Africa live without light.[17]
- *Pollution*: Toxic waste from hospitals and industrial sites, as well as garbage and human waste, are dumped in the river and its tributaries without treatment, polluting the water and spreading disease. Further, increase in demand for water among urban dwellers contributes to polluting water. This is worsened by development and lack of strict controls on pollution as industries continue to discharge their waste into rivers.
- *Rapid growth in demand for drinking water*: As lifestyles continue to change, increasing urbanisation diminishes the potable water available in towns owing to greater drinking, industrialisation and sanitation needs, for which infrastructure is not in place to satisfy.

Water scarcity by itself does not trigger war; the issue is the governance of water. In conflict-prone countries facing poverty, livelihood pressures and unaccountable government systems, an absence of clear water management policies in the face of reduced rainfall may overwhelm the government's ability to provide for the basic needs of its community. This governance failure can contribute to unrest and conflict. This is particularly true of communities where low intensity conflicts, usually managed using local systems, become complicated and fall beyond the realm of these coping mechanisms, especially when they involve state-sponsored development projects, such as the constructions of dams, and foreign investment in large-scale agriculture. Involvement of these actors will increase conflict intensity, which can then lead to violence.

In West Africa, as the number of large dam projects increases, the level of interdependency of countries continues, and as availability of water reduces, a fertile ground for misunderstanding and tension among countries is created. Examples include Senegal and Mauritania in June 2000; Burkina Faso and Ghana in 1998, when the increase of water use by Burkina Faso reduced the amount of water going to the Akosombo hydroelectric power station; Benin and Niger, where the sovereignty of Lété Island, the meeting-place of nomad pastoralists from Niger who settle there seasonally, and sedentary farmers from Benin; Niger and Nigeria when Niger constructed dams thereby reducing water flow to Nigeria which has large dams for hydro agricultural and energy; Cameroon and Nigeria, where the 'migration of Lake Chad' attracted Nigerian immigrants to the Cameroonian part of the lake. These tensions did not lead to violence, but were solved through dialogues. The solutions to addressing these multiple challenges are through targeting governance and management capacity, policy and practice.

NIGER RIVER BASIN AUTHORITY

The management of the river requires a sensitive balancing act between the sustainable use of natural resources and potentially competing livelihoods including farming and livestock. Water resources have historically been a source of cooperation when times are good, and conflict when resources are stretched.

The Niger River Basin Authority (NBA), headquartered in Niamey, Niger, is mandated to foster, promote and coordinate studies and programmes relating to the basin. Required to promote cooperation among member countries and ensure integrated development of resources, notably energy, water, agriculture, forestry, transport and communication, the NBA has worked to create an 'Integrated Development Plan of the Basin', focusing on cross-boundary projects. However, benefits as yet have not been felt by member states.

The institutional infrastructure of the NBA consists of the Summit of Heads of Government, which makes policy, the Council of Ministers, Technical Committee of Experts and the Executive Secretariat, responsible for implementing decisions of higher bodies. Ministers representing member states meet yearly and heads of state and foreign contributors meet at a regular conference of the Heads of State of the Niger Basin Authority and Partners. The 8th Summit of the Niger Basin Authority Heads of State and Government took place in Niamey in April 2008, and agreed on the implementation of the 2008–2027 Investment Programme of the River Niger Basin, the Water Charter of the River Niger Basin, creation of a donors' meeting for the implementation of the 2008–2012 priority five-year plan, acceleration of the Taoussa Dam project in Mali and the Kandadji Dam project in Niger. The NBA derives funds from member states and international donors, participating in cooperative projects with organisations such as the World Wildlife Fund, Wetlands International, and foreign donor governments.

Policy options and recommendations

There is a great deal of interdependency because rivers traverse national and international boundaries, involving upstream and downstream users. Water has not only economic worth, but interdependent social, religious and cultural value, so it is critical to design a policy which takes these components into account, promoting equitable access and supply, maximising value for users, and taking environmental impact into account. Water should be made available to the most vulnerable groups, such as children, local communities, and people living under poverty. Equitable and sustainable international water resource management (IWRM) requires flexible, holistic and inclusive institutions able to respond to hydrological variations, changes in socio-economic needs, societal values, and political regime changes.

- Advise IWRM institutions to have clear mandate and guidelines, so they do not disseminate policies insensitive to riparian rights and access to water
- Encourage the establishment of basin authorities that develop a shared vision on transboundary rivers and consensus strategy on water usage, as well as creating forums such as the ECOWAS Permanent Forum for the Coordination and Monitoring of the Integrated Management of Water Resources in West Africa (CPCS-GIRE)
- Increase knowledge bases and technical expertise, including developing assessment indicators and increasing the quality of information available, by training research institutions
- Develop governmental bodies, at national and local level whose work directly or indirectly affects water resources management, including policies and plans for land use, environmental protection and conservation, economic development and trade
- Explore and encourage indigenous coping mechanisms. For example, migration of people in most communities are not perceived to be a threat, but an accepted way of addressing the problem
- Encourage and collaborate with initiatives that will bring added value to the climate and water security agenda. For example the Great Green Wall for the Sahara and Sahel aims 'to improve the livelihoods of the inhabitants of the Sahel-Sahara zones, and enhance environmental sustainability' and 'contribute to climate change adaptations and mitigation'
- Coordinate, collaborate and integrate awareness creation, sensitisation programs and campaign at national and international level, including harmonisation of donor strategies.
- Adopt a conflict-sensitive 'do no harm' philosophy or 'be your brother's keeper' approach, which will encourage sharing and mutual benefits to all concerned
- Develop a climate policy that keeps a balance between mitigation and adaptation solutions that limit the overall impacts of climate change
- Intensify efforts to promote emission reduction and use alternative means to satisfy energy needs, for example wind and solar energy to generate steam and run turbines to generate power.
- Promote women's involvement in the water sector, using a gender analysis framework to understand how policies and programs impact women and men of different classes and economic backgrounds

- Involve civil society organisations in creating awareness, facilitating inter-group dialogues and developing a framework for water management
- Initiate steps to incorporate climate change issues in school curricula at all levels particularly for children and adolescents.[18]

CONCLUSION

The likelihood of violent conflict in the Niger River Basin in the future is improbable, indicative of the wider reality. Although climate-induced stresses can trigger local disputes, these can be managed locally. If conflict crosses national boundaries, there are structures and institutions such as the NBA and regional economic communities that can facilitate dialogue.

The structures of the NBA demonstrate that the highest level of policy makers, that is, heads of state, are willing to engage, showing the existence of political will. Civil society activists can use this open door to accompany and encourage policy makers to use a bottom-up, inclusive and participatory approach in policy development. The issue is governance: a holistic, inclusive and integrated water management approach with functional basin authorities will facilitate dialogue for developing mitigation and adaptation strategies.

NOTES

1 V Boge, Water governance in Southern Africa: Cooperation and conflict prevention in transboundary river basins, Conversion Brief, Bonn International Centre for Conversion Bonn, 2006.

2 Intergovernmental Panel on Climate Change (IPCC) Assessment Reports, available at http://www.ipcc.ch/, accessed August 2009.

3 UNESCO 2003 Global Water Scarcity, available at http://www.google.com/search?hl=en&q=UNESCO+2003+Global+Water+Scarcity+&btnG=Search&aq=f&aqi=&aql=&oq=, accessed August 2009.

4 A A Cronin, D Shrestha and Paul Spiegel, Water: New challenges, *Forced Migration Review* 31 (2008), 26–27.

5 W Barnaby, Do nations go to war over water?, *Nature* 458 (19 March 2009).

6 A T Wolf, Conflict and cooperation along international waterways, *Water Policy* 1(1998), 251–265.

7 M Goulden, D Conway and A Persechino, Adaptation to climate change in international river basins in Africa: a review. Tyndall Centre Working Paper 127, December 2008.

8 Goulden et al, Adaptation to climate change in international river basins in Africa.

9 S Solomon, D Qin et al (eds), Regional Climate Projection Climate Change 2007: The Physical Science Basis, Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge: Cambridge University Press, 2007.

10 P C D Milly, K A Dunne and A V Vecchia, Global pattern of trends in streamflow and water availability in a changing climate, *Nature* 438(7066) (2005), 347–350.

11 Global Hunger Index 2008, available at http://www.ifpri.org/publication/challenge-hunger-2008 (accessed August 2009).

12 M E Brown, J P Verdin, C C Funk et al, Markets, climate change and food security in West Africa, Scholar One Manuscript Central, 2009.

13 A Tarhule, Damaging rainfall and flooding: The other Sahel hazards, *Climatic Change* 72(3) (2005): 355–377.

14 I Verocai, Environmental and social impact assessment for large dams: Thematic review from point of view of developing countries, Margate, Kent: World Commission on Dams, 2000.

15 World Commission on Dams, Dams and development: A new framework for decision making, Margate, Kent: World Commission on Dams, 2000.

16 Aaron Wolf, Oregon State University, available at http://www.transboundarywater.orst.edu, accessed August 2009.

17 International Energy Authority 2004, available at http://www.google.com/search?hl=en&q=International+Energy+Authority+2004.&start=10&sa=N, accessed August 2009.

18 Ibid.

Migingo Island

Sources of conflict, approaches and assessment of intervention efforts by Kenya and Uganda

Michael A O Oyugi
Deputy Head of Mission, Kenya Embassy, Addis Ababa, Ethiopia

INTRODUCTION

What and where is Migingo Island?

Migingo Island is a piece of rock located well inside Lake Victoria. More precisely, it is situated around the maritime borderline between Kenya and Uganda. It is approximately one acre or 4,000 m^2 in size[1] and has a population of about 500 people. It is estimated that most of these are Kenyans. The island remained largely uninhabited by human beings, at least not continuously, until 2004.[2]

CONFLICTS

The disputes about Migingo can be categorised broadly as revolving around two issues. One appears to be simply a question of territorial expansion.[3] The other is about resources obtaining around the island. Ugandan authorities have publicly stated that they regard the dispute over the island as a tussle over fishing rights in the fish-rich surrounding waters.[4] The Ugandan state minister for fisheries commented that 'If any country controls that area it means they control the waters, hence a bigger fishing area.'[5] But the two issues – territory and resources – are so closely interrelated that the dividing line becomes thin because one leads to the other.

Territorial

The island's location on the common border makes it strategic as a potential 'listening' post and patrol base from a security perspective. It also offers a vantage point for control over fishing and other commercial activities in the vicinity. Kenya and Uganda have both claimed ownership of Migingo. Such claims have been made through means that are expressly, or quasi official. So how have these claims been made?

Kenya

The government of Kenya has argued that Migingo is clearly a part of its territory, having been so determined early in the colonial period.[6] Britain, the colonial authority, set the boundary between Kenya and Uganda in Lake Victoria and recorded it in The Kenya Colony and Protectorate (Boundaries) Order in Council, 1926.[7] This document elaborates the Kenya–Uganda boundary in three sectors or schedules of which schedule 1 concerns Lake Victoria.[8]

Verbal pronouncements made by, or attributed to, senior government officials have re-affirmed this claim. The president of Kenya, while on a tour of one of the districts on the Kenyan side of the lake, was reported to have assured the fishing community that the island belonged to Kenya.[9]

These claims have been supplemented with physical presence of governmental authority and activity on the disputed territory. Kenyan administrative personnel, including police, have been deployed to the island irregularly. The most recent of these were census officials who reportedly conducted a count and other census activity in Migingo in August 2009, as in the rest of Kenyan territory.[10]

Uganda

Uganda has also laid a strong claim to the island. This has been partly through pronouncements by senior officials. Uganda has left no doubt about its claims by hoisting its national flag and deploying, inter alia, security and administrative personnel on the island. The latter are

known to have been levying taxes, besides taking other administrative steps there.

RESOURCES

Fish

The primary resource abounding in the waters around Migingo Island is fish, specifically the Nile perch species. The island is surrounded by deep waters, providing an ideal habitat for this huge fish species. This means that fishermen based there do not have to sail far and wide for their catch.

Communities living around the lake traditionally rely on fish as a source of food and a commodity for trade. Large-scale commercial fishing has taken root around the lake. The annual catch is 800,000 tonnes of fish valued at about US$590 million.[11] Of this, US$250 million is from exports of Nile perch. These exports have been sent to places as remote as European markets. The quest to meet the demand from such markets has led to intensification of mechanised harvesting of fish from the lake.

Water

Naturally, water is the biggest resource in Lake Victoria. Being fresh and abundant makes it even more valuable. To date, however, it does not appear to have been a source of conflict among the three countries that territorially share the lake (Kenya, Uganda and Tanzania).

The waters of Lake Victoria, as a major source of the River Nile, are nevertheless the subject of protracted negotiations under the auspices of the Nile Basin Initiative.[12]

The location of Migingo Island seems to be strategic from a security and general trade perspective. It lies on the lake routes that link Kenya and Uganda. Indeed Ugandan authorities assert that its officials first moved on to the island in 2004 to 'check smugglers and criminals who were using the rock as a stage to carry out their criminal activities on our territorial waters'.[13]

The strategic location makes the island an attractive spot to establish an administrative base. Thus, besides generating revenue from taxes levied on fishing and support activities, the surrounding lake routes and trade in non-fish commodities can be controlled from here.

STEPS TAKEN BY THE GOVERNMENTS OF KENYA AND UGANDA TO RESOLVE THE CONFLICT

The two countries have taken action separately and jointly in addressing the issue. Furthermore, the action has been taken and implemented at different levels. Official pronouncements have come from the highest levels in government.

The first major joint step taken by Kenya and Uganda to resolve the Migingo dispute was at the level of ministers. Representatives of the two countries, led by cabinet ministers, met in Kampala from 12 to 13 March 2009 to tackle the issue.

The meeting agreed on these guiding principles:

- Primary source or reference documents to be The Order in Council of 1926, Schedules to the Uganda Constitution of 1995, and the Kenya Constitution of 1963
- Immediate withdrawal of all security personnel from the island to facilitate a joint boundary survey
- This survey to be completed within two months of the date of the communiqué 13 March 2009.
- Cessation of harassment of fishermen from both countries and respect for fishing regulations as stipulated under the Lake Victoria Fisheries Organisation
- The agreement had been concluded within the framework of the East African Community (EAC) and its objective of regional integration[14]

The Kenyan delegation was led by the minister for foreign affairs, Moses Wetang'ula. Uganda's was headed by Kirunda Kivejinja, third deputy prime minister and minister for internal affairs.[15]

The joint ministerial meeting in Kampala was a turning point in terms of the method and type of solution sought by the governments of Kenya and Uganda. Both the convening of the meeting and its outcome left no doubt that the two countries were determined to do more than resolve the matter amicably. The communiqué indicated that they wanted to fortify their bilateral relations and promote integration in the spirit of the EAC.

The two ministers took their crusade for a peaceful solution to their parliaments, where members debated the Migingo dispute.

The Kenyan minister reaffirmed the resolve for an amicable solution before an agitated house. He informed parliament that in the event of failure by the two countries to resolve any aspect of the dispute, there was a whole chain of alternative peaceful platforms. These were the EAC the Inter-Governmental Authority on Development (IGAD), the AU, and ultimately, the UN all of which have conflict resolution mechanisms.[16]

Another Kenyan member of parliament, the assistant minister for East African Community affairs, also emphasised in parliament the government's resolve to achieve a peaceful solution to the dispute.[17]

From the onset, the president of Kenya, Mwai Kibaki, stressed that the dispute would be resolved amicably.[18] He

added that Kenya was 'committed to the ideals of the East African Community and will not allow any issue to be a stumbling block'.[19]

On his part, President Museveni ordered the lowering of the Ugandan national flag on Migingo Island. This was to facilitate preparations to demarcate the border and to allay the concerns of the Kenyan populace.[20]

The Ugandan parliament too had its share of debate on Migingo. The minister of state for regional affairs, Isaac Musumba, read a ministerial statement before parliamentarians concerned about the dispute.[21]The minister stressed the importance of addressing the issue in a peaceful manner as stipulated in the joint communiqué of 13 March 2009.

Ugandan authorities on their part clarified media reports attributed to President Museveni and underscored the determination to find a peaceful solution. Thus while recalling the good relations with Kenya, the government stated: 'Furthermore, the Government of Uganda reassures citizens of both countries that the issue of Migingo Island sovereignty shall be resolved amicably and diplomatically.'[22]

The two heads of state have met twice since the escalation of the dispute in early 2009. Although these meetings had been convened to deliberate on other issues, the question of Migingo featured prominently. The first was held in Lusaka, Zambia, on 7 April 2009, on the fringe of the High-Level Conference on the North-South Corridor. They stated that the dispute must not spoil the good relations between Kenya and Uganda and that it should be resolved in line with the joint communiqué.[23] The two presidents expressed the importance of ensuring that the people of the region benefited from the common resource of the lake and thus the need to maintain peace in the region.

Three weeks later, the two presidents reiterated their stand and urged the joint boundary survey team to conclude its work expeditiously. They were concerned about the negative impact of the dispute and agreed to continue to consult to ensure that the issue was resolved amicably. 'We are determined to settle the question of Migingo Island amicably and in the Spirit of East African solidarity and partnership.'[24] They also instructed the police chiefs of the two countries to constantly consult and maintain law and order on the island. The police chiefs held their initial meeting on 2 April 2009 in Kampala. They agreed to put in place mutually agreed security measures pending the completion of the joint boundary demarcation exercise.[25]

The two governments also held a joint press conference in Nairobi. This was conducted by the official spokespersons of the offices of the two presidents.

IMPACT OF CLIMATE CHANGE ON MIGINGO ISLAND

Migingo is a tiny piece of territory, a rocky outcrop measuring one acre and roughly the size of a football field. It is too small for the island to constitute a micro-climatic zone on its own. Therefore the impact of climate change on it can be discussed meaningfully only within the context of the lake and the nearest adjacent shoreline and its hinterland.

Lake Victoria

Lake Victoria is the world's second biggest freshwater lake. It has a surface area of 68,800 km^2 and a volume of 2,750 km^3. The average depth is 40 m, but reaches 84 m in some places. The shore line measures 3,440 km. Its water catchment area is 184,000 km^2.[26] Of the total surface area of 68,800km^2, 51 per cent is in Tanzania, 43 per cent in Uganda, and 6 per cent in Kenya.[27] Ten major rivers drain into the lake. Most of these are from Kenya. The main outflow is the White Nile River in Uganda.

Environmental degradation has taken its toll on the lake, affecting fish stocks and other marine life in the water body. Forests that form water catchment towers – such as the Mau and Cherangani in Kenya – have suffered from massive tree felling.[28] Rivers and streams rising from these and other forests areas are drying up, resulting in diminishing volumes of water reaching the lake increasing siltation from soil erosion of progressively more bare hill slopes and river banks.

The lake has suffered further degradation from toxic effluents and other pollutants released directly into it or through rivers. The pollution comes mainly from industries and related human activity in towns located in the lake basin. This in turn has destroyed the delicate balance of eco-systems of breeding areas of many fish species. Similarly, food in the fish habitat has been affected quantitatively.[29]

Overall, fish stocks in traditional close-shore fishing areas of the lake are diminishing, resulting in overfishing. Fishermen therefore are increasingly compelled to venture in search of new fishing grounds, often farther from the shores, in the unending quest to meet demand.

CONCLUSIONS AND PROSPECTS

Two main problems or issues underlie the Migingo dispute. One is fish stocks. Fish from the lake has become popular as a dish and is appreciated widely in Eastern Africa and beyond. Therefore stocks are diminishing. This is due not only to increasing demand, but also to the effects of environmental degradation. Thus fishermen are pressed to seek new fishing areas.

The other problem is the boundary line. Demarcation along the maritime border between Kenya and Uganda has not been done. There are no beacons or any form of marking of the boundary line.

The rising demand for fish, the resultant depletion of stocks and lack of borderline demarcation make for a potentially explosive situation. Hence to stem the current conflict and avoid a recurrence, the boundary should be demarcated as an immediate measure. This should be feasible since the line is well described in the basic common reference document.

While awaiting the outcome of the joint border survey exercise, the two countries should maintain direct official contact at high levels. They should avoid unilateral or other interventions on the island that would disrupt the way of life of the islanders, especially legitimate commercial activities.

As a long-term step to reduce the possibilities of conflict over resources, Lake Victoria riparian states should arrest the deterioration of the lake ecosystem by, inter alia, stemming environmental degradation in their hinterlands and the emission of toxic effluents into the lake. Restoration of the ecosystem is likely to facilitate re-generation and re-stocking of fish and other life species.

Approaches to the dispute

The two countries have so far addressed the dispute at two main levels. One is the ministerial or policy level. The other is the technical level, involving surveyors and related professionals. Whereas the approaches at technical level have been fairly identical, the same has not been so at policy level.

On the Kenyan side, the lead actor has been the minister and ministry of foreign affairs. The minister led the delegation to the Kampala talks in March 2009 and co-signed the communiqué. The same minister took up the matter in parliament on behalf of the government. In light of this, Kenya's approach apparently places a premium on diplomacy, peaceful co-existence and good relations with its neighbour.

For Uganda, the leader of the delegation and co-signee of the communiqué was the third deputy prime minister and minister for internal affairs. The portfolio of this ministry is mainly police and security issues. The approach therefore seems to favour security and related concerns.

Could this variation in approach be a manifestation of different thinking or interpretation of the dispute? If so, what could this portend for the search for a solution to the matter? The approaches by the two states, ipso facto, are not necessarily contradictory, but they may not dovetail.

The importance the two sides have accorded to an amicable solution has borne fruit already. It has deflated tension in the public domain where extremist views in some quarters had alluded to the possibility of a military solution to the dispute. By showing preference for an amicable solution, Kenya and Uganda have respected the cardinal principles of peaceful co-existence and peaceful resolution of conflicts as enshrined in the articles of regional and global intergovernmental bodies such as the EAC, IGAD and the UN.

The decision to engage in direct talks – as opposed to resorting to third parties – may help to avoid or minimise misunderstanding, accelerating the achievement of a durable solution.

Active participation of the highest offices in the two countries has been beneficial and has facilitated quick policy decisions which have guided the handling of the dispute.

The dispute appears to be more a question of marking the boundary line than a clamour for more territory. This can be deduced because the two countries have agreed to use common documents as a basis for reference. The texts provide a similar definition of the boundary line based on colonial document(s). This is likely to facilitate the search for a solution.

NOTES

1 *Encyclopaedia Britannica*. Available at http://www.britannica.com (accessed July 2009).

2 Patrick Mayoyo and Elisha Otieno, Long-standing struggle for Migingo to be discussed, *Daily Nation*, 11 March 2009.

3 State House Kenya and the Ministry of Foreign Affairs, Kenya, have asserted in media briefings that the island is Kenyan. Uganda's Office of the President and Ministry of Internal Affairs have made similar claims.

4 Ministerial statement in *Hansard*, Uganda, 29 April 2009.

5 Ibid.

6 Ministry of Foreign Affairs of Kenya, briefing, Nairobi, February 2009.

7 The Independent,/ Migingo Island: What 1926 boundaries say, available at http://www.google.com/search?hl=en&q=The+Kenya+Colony+and+Protectorate+%28Boundaries%29+Order+in+Council%2C+1926&btnG=Search&aq=f&aqi=&aql=&oq=(accessed September 2009).

8 Boundary from 1° south latitude, through Lake Victoria to the Mouth of the Sio River. Commencing in the waters of Lake Victoria on a parallel 1^{0} south latitude, at a point due south of the westernmost point of Pyramid Island; thence the boundary follows a straight line due north to that point; thence continuing by a straight line northerly to the most westerly point of Ilemba Islands; thence by a straight line, still northerly, to the most westerly point of Kiringiti Island; thence by a straight line, still northerly, to the most westerly point of Mageta Islands;

thence by a straight line north-westerly to the most southerly point of Sumba Island; thence by the south- western and western shores of that island to its most northerly point; thence by a straight line north-easterly to the centre of the mouth of the Sio River.

9 Elisha Otieno, Fishermen hail Kimbaki directive on Migingo, *Business Daily*, 28 July 2009.

10 Spatial Data Infrastructure, All set for survey of Migingo Island in Lake Victoria (17–28 August 2009), available at http://219.238.166.217/pcgiap/tech_paprs/May_2009_pdf.pdf.

11 Lake Victoria Fisheries Organization, State of fish stocks, available at www.lvfo.org, accessed 25 September 2009.

12 See Debay Tadesse, Review of early experiences, current challenges and opportunities among the Nile Basin riparian states, ISS Seminar presentation, 29 September 2009.

13 Ministerial statement on the status of Migingo Island, in Parliamentary Proceedings, 56.

14 Joint communiqué, Kenya–Uganda, issued at Kampala on 13 March 2009.

15 Ibid.

16 National Assembly Official Report, 27 May 2009, 27–37.

17 Ibid.

18 State House Kenya Internet press release, Migingo issue will be resolved amicably, 26 March 2009. See official State House website at www.statehouseekenya.go.ke/, news archives.

19 Ibid.

20 Barbara Among and Reuben Olita, Uganda removes flag on Migingo, *New Vision*, 3 May 2009.

21 Record of Parliamentary Proceedings.

22 Office of the President/Uganda Media Centre Internet press release, 16 April 2009.

23 State House Kenya, Internet press release, Kenya and Uganda hold talks on Migingo Island, 7 April 2009.

24 State House Kenya Internet press release, Joint survey team on Migingo urged to complete its work within three months, 29 April 2009.

25 Government Communications /Office of the President, Internet press release, 16 April 2009.

26 International Lake Environment Committee, electronic database, 1–2.

27 Ibid.

28 Lake Victoria ecology, resources, environment, *East African Agricultural and Forestry Journal* 24 (4): 274–278.

29 Ibid.

Assessing climate change and desertification in Africa

The Niger experience of combating desertification, in the region

Dr Amadou Sonrhai Oumarou
Embassy of Niger in Ethiopia

INTRODUCTION: BRIEF OVERVIEW OF THE CHARACTERISTICS OF NIGER

Niger is a country of West Africa, located in the heart of the Sahel, and covering an area of 1 267 000 km². It is a crossroads between North Africa and sub-Saharan Africa, and between West Africa and Central Africa. It shares borders with Libya and Algeria in the north, Benin and Nigeria in the south, Chad in the east, and Burkina Faso and Mali in the west. It is situated 1 900 km east of the Atlantic coast and about 700 km from the Gulf of Guinea.

Figure 1 Geographical location of Niger

Climate characteristics

There are four distinct climatic areas:

- Sahel-Sudanese area, representing about 1 per cent of the total surface of the country and receiving 600 to 800 mm of rain per year in normal years
- Sahel area, covering 10 per cent of the country and receiving 350 to 600 mm of rain annually
- Sahel-Saharan area, representing 12 per cent of the land area and receiving 150 mm to 350 mm of rain annually
- Saharan area, desert, covering 77 per cent of the country and receiving less than 150 mm per year

Despite the aridity of the country, the rural sector plays an important role in the national economy and contributes up to 43 per cent of the GDP.

Natural resources

Land resources

The potentially cultivable area is 15 million hectares, representing less than 12 per cent of the total surface of the country, while cultivated land is estimated at 6 million ha. The potentially irrigable area is 270 000 ha, representing 4 per cent of the total surface, of which 140 000 ha are located in the Niger River valley.

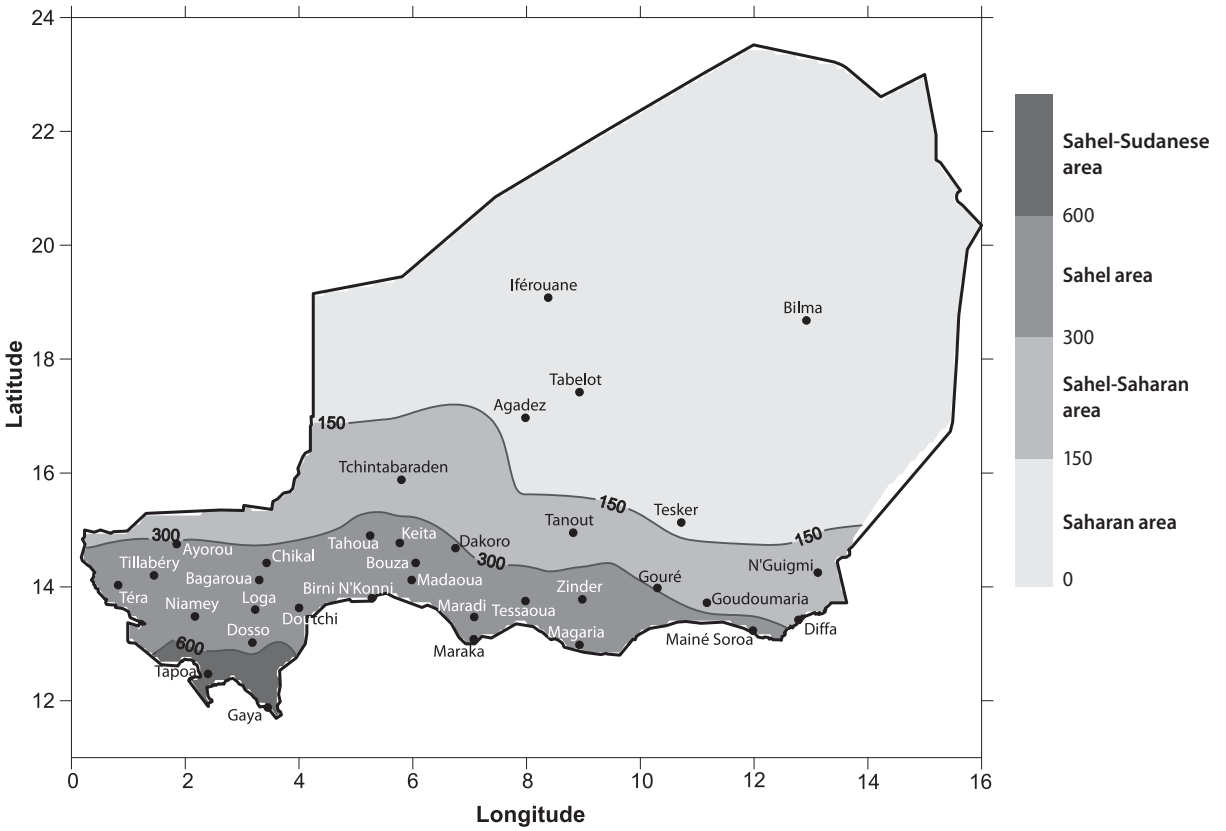
Water resources

The water resources of Niger consist of precipitation, surface water and groundwater. Niger has significant potential as far as water resources are concerned, particularly ground and surface water.[1]

The rainfall varies by year from 0 mm to 800 mm/year from north to south. It rains from June to September, the remaining months generally being completely dry.

Surface water resources are important and constitute more than 30 billion m³/year, of which only 1 per cent is used.

Figure 2 Main climatic areas of Niger



A large part of the water flows from the Niger River and its right-bank tributaries: more than 29 billion m^3/year. Built reservoirs (dams) allow water storage. Today there are about 20 of them, totalling nearly 100 million m^3. There also are large numbers of permanent or temporary ponds associated with dam construction projects, of which the most important is at Kandadji. There are 175 permanent ponds.

Groundwater represents 2.5 billion m^3 renewable per year, of which less than 20 per cent is used, and 2 000 billion m^3 non-renewable, of which a very small amount is used for mining works in the north of the country.

The soil

The soils are generally poor in nutrients and with a low level of organic matter, reduced fertility, a tendency toward acidification and low water retention. The potentially cultivable surface is estimated at 15 million hectares, representing less than 12 per cent of the total surface of the country.

Vegetation

Nigerien flora include around 1 600 species. The surface of forested land is estimated to be 14 000 000 ha. These are the main domestic sources of energy for the population, and provide fodder, medical, and scientific interest. The major bioclimatic areas are:

- Saharan area
- Sahel-Saharan area
- Sahel area
- Sahel-Sudanese area[2]

Fauna

Studies carried out as part of drafting the National Strategy and Action Plan for Biological Diversity noted

Table 1 Distribution of the ponds by region

Region	Agadez	Diffa	Dosso	Maradi	Tahoua	Tillabéry	Zinder	CU Niamey
Number of ponds	10	120	113	40	282	145	300	13
Permanent ponds	-	5	54	4	39	51	20	2

that, as far as is known, Niger accounts for 3 200 animal species, of which 168 species are mammals, 512 species of birds, 150 species of reptiles and amphibians, 112 species of fish, as well as large numbers of invertebrates (molluscs, insects).

NATIONAL DEVICE FOR FIGHT AGAINST DESERTIFICATION

The international community (states and organisations) met on June 1992 in Rio de Janeiro (Brazil) for the United Nations Conference on Environment and Development (UNCED) in order to provide sustainable solutions to issues related to the environment and development, which are everybody's concerns.[3]

This conference, also called the Earth Summit, allowed the international community to adopt a global action plan for promoting sustainable development from socio-economic and environmental pointS of view (Agenda 21).

Three framework conventions and additional protocols were negotiated and signed by several countries, including Niger:

- Convention on Biological Diversity (CBD)
- Convention on Climate Changes (CCC)
- Convention to Combat Desertification (CCD), which will be the object of our work, particularly in the context of studying its implementation.

In the context of the implementation and follow-up of post Rio conventions, as early as June 1993 the Nigerien government implemented the National Committee for Monitoring the United Nations Conference for Sustainable Environment and Development (COMNAT).[4] To find sustainable solutions and at the same time to respect the commitments made at international level by Niger, the work carried out by COMNAT has led to the creation of the reference framework for the National Plan of Environment for Sustained Development (PNEDD), integrating all current and future efforts related to combating desertification for sustained development.

The National Council of the Environment for Sustainable Development (CNEDD) was created to ensure the optimal application and monitoring of the commitments made by Niger at the Rio conference and of the recommendations formulated during the dialogues organised by COMNAT/UNCED[5] regarding the establishment and the stable, functional, and politically strong framework.

The permanent framework of CNEDD has as its mission the planning, scheduling, coordinating, elaborating, implementing, monitoring, and evaluating the progress of activities included in PNEDD.

To ensure the political strength it needs, and the required institutional coherence, CNEDD was placed under the supervision of the Office of the Prime Minister, and is chaired by the cabinet director. Additionally, it includes three vice-presidents:

- The secretary general of the Ministry of Environment
- The representative of civil society
- The secretary general of the Ministry of Finances and Economy

CNEDD is made up of:

- One third: representatives of the state and its branches
- Two thirds: representatives of civil society

The council has an executive secretariat, which is the body that prepares and executes the decisions of CNEDD. It has created several committees, such as:

- Committee for Combating Desertification and Managing Natural Resources, created by Decree no 066/PM/SE/CNEDD of 21 July 1997
- Committee on Biological Diversity, created by Decree no 053/PM/SE/CNEDD of 21 July 1997
- Committee on Climatic Changes, created by Decree no 054/PM/SE/CNEDD of 21 July 1997
- Committee on Financing the Environment, created by Decree no 093/PM/CNEDD of 5 November 1997

These committees proved to be non-functional, which led to the revision of membership through the creation in the council of five thematic work groups:

- Energy – Water – Road Infrastructures
- Agriculture – Livestock farming, Forestry
- Fishing and Wetlands
- Industrial Processes, Waste and Health
- Mechanism for Clean Development

Similarly, CNEDD regional councils have been created, as well as other internal and external bodies to ensure its optimal functioning. The entire mechanism is tasked with the implementation of the three post-Rio conventions, in particular the CCD, which will be the object of detailed examination.

Specialised technical committees have been created, among them the Committee on Climatic Changes and Variability (CTVCC), created in 1997, and made up of representatives of the public service, para-public bodies, research and training institutions, universities, civil society, and the private sector. Its mission is to support the Executive Secretariat of the National Council of

Environment for a Sustainable Development (SE/CNEDD), in implementing the Climate Changes and Variability Programme. One of the major objectives of the programme is implementation at national level of the provisions of the United Nations Framework Convention on Climate Change (UNFCCC).

IMPLEMENTATION OF THE UNITED NATIONS CONVENTION TO COMBAT DESERTIFICATION

Steps

Since gaining its independence, Niger has been dealing with major social and economic development issues, linked in part to the environmental crisis it faces. The causes are partly natural, because three quarters of Niger is covered by desert. To this should be added human actions and pressures on natural resources, in particular vegetation, water, and the soil.

This is why the national development plans and programmes that were drawn up and/or implemented before and after the signing of the convention have given a prominent place to the politics and strategies of combating desertification, for example the Economic and Social Development Plan of 1987–1991; the Economic Recovery Programme, developed in 1996; and state investment programmes, which affect two thirds of the resources allocated to the environment for combating desertification and its consequences.

Through the implementation of the International Convention for Combating the Desertification (ICCD), the government has undertaken a series of measures.

Thus, the drafting in 1998 of the National Plan for Environment for Sustainable Development (PNEDD), National Agenda 21, under the auspices of CNEDD sets combating desertification as an absolute priority while researching for sustainable development. The National Action Plan to Combat Desertification and Natural Resources Management (PAN-LCD-GRN) is just one of six major programmes of PNEDD. Three strategic axes determine the highest priority fields of intervention for PAN-LCD-GRN:

- Natural resources and their mode of exploitation
- Hazards and constraints related to natural resource management
- The mechanism supporting PAN-LCD-GRN

After analysing these main fields, priority actions and measures were identified to efficiently combat desertification, to mitigate the effects of drought, and to create a solid base for sustainable management of natural resources.

Five other programmes have been accepted:

- Water and Sustainable Development
- Energy and Sustainable Development
- City Environment and Lifestyle
- Biological Diversity Management
- Changes and Climate Variability

Other plans, projects and sector-based strategies that emphasise combating desertification have been drawn up and implemented, for example those concerning population, combating poverty, biodiversity conservation, energy, basic education, and land management.

Moreover, because of the economic crisis that persists in the country, the Economic Recovery Programme was drawn up in 1996 and approved by government through Law no 97-024 of 8 July 1997. This programme makes combating desertification one of its main tasks in improving the Nigerien economy and the living conditions of the population, especially through improving the performance of production systems. The execution of this programme is in progress. Other important projects combating the desertification and its effects are under way.

Niger has published its Initial National Communication and undertaken a number of activities, including:

- Developing the National Strategy and Action Plan for Climate Changes and Variability with the support of UNDP/GEF
- Organising information and awareness workshops on climate changes, on the MDP (Mécanisme pour un Développement Propre, Mechanism for Clean Development) with regard to the structures of the state and civil society. These workshops have led to the identification of nine project ideas
- Drawing up the Programme d'Action Nationale pour l'Adaptation aux Changements Climatiques (PANA) with the objective of decreasing the damaging effects that climate changes have on the population

The means

Governments that have succeeded have accorded absolute priority to combating desertification across all current projects. These alone represent more than 30 per cent of the total capital budget for 1999 and 35 per cent of the State Investment Programme 1999–2001. This priority has been reinforced through the creation of the Ministry for Environment and Combat Desertification in the Government of the Fifth Republic.

The Nigerien state has undertaken new actions to mobilise resources at national level. This concerned notably

the creation of the National Environment Fund whose funding is open just as much for the purposes of national actors as external partners. The resources for this fund, which was planned initially to combat desertification, now cover the environment in its totality.

A number of partners have supported the process of drawing up the PAN-LCD-GRN:

- Coopération Française
- CILSS
- World Bank, through the GRN project

It must be stressed that in support of the UNDP, UNSO and Capacity 21 for the PNEDD, CCD information and awareness actions took place.

Other partners of the Observatoire Du Sahara et du Sahel (OSS) and IFAD (International Fund for Agricultural Development) brought their technical support.

The projected budget for PAN/LCD-GRN implementation has risen 240 billion CFA francs. The forum for the approval of the PAN/LCD-GRN document took place in 2000, followed by a roundtable on it, organised jointly with the National Validation Forum.

Since the Parties Conference (COP), the support has come from:

- Italy, through IFAD, by financing the project for supporting the drawing up and implementation of the National Action Programme to Combat Desertification and Natural Resources Management (PAN/LCD-GRN) 1999-2000
- CILSS, by organising the PAN/LCD-GRN national validation forum
- UNSO, through recruiting a sub-regional consultant for a study of the consitution of the National Fund for the Environment

The needs sum up to mobilising the financial resources for the implementation and follow up/evaluation of the PAN-LCD-GRN.

Acquired knowledge and achievements

Skills and products that have been realised include:

- The document of the PAN/LCD-GRN project
- Adherence to and ownership of the PAN/LCD-GRN process by the population and civil society
- Financing of the PNEDD (DAP-PNEDD) Support Document for the implementation of the PAN/LCD-GRN between the Niger government and the UNDP, dated June 1999. One of the three objectives of the support document is to offer community action pilots for the Sustainable Management of the Natural Resources at local level in Téra Nord (Bankilaré) and Haute Tarka (Belbédji)
- Project to Support the Development and Implementation of the National Action Programme to Combat Desertification and Natural Resource Management (PAN/LCD-GRN) 1999–2000. This file, put together with the help of the International Fund for Agricultural Development (IFAD), has been presented to the same institution for financing. It has as objective the completion of the process of developing PAN-LCD-GRN and laying the foundation for concrete pilot actions to combat desertification
- Completing the analyses of case studies in the villages and areas chosen for the cross-border pilot projects as part of the fight against desertification
- The appointment of Italy as leader of the partners in the cooperation, with the task of coordinating and harmonising their involvement in CCD implementation
- National report on CCD implementation
- The document on the PNEDD, PAN-LCD-GRN process, titled 'Niger and the challenge of desertification'
- The organisation of the national forum to validate, finalise and adopt PAN-LCD-GRN

Concerning the actions specific to PAN-LCD-GRN implementation, it should be noted:

- The implementation of the support document for PNEDD (DAP/PNEDD), whose activities are executed at these levels:
- Regional offices of Bankilaré and Belbédji
- National Water Programme
- Support cell for the Implementation of the Programme Support Document (DAP)
- CNEDD Executive Secretariat
- Implementation of the support project document for development and implementation of PAN/LCD-GRN with financing from Italy (IFAD)
- Development of the national report of CCD implementation in accordance with the guidelines drawn up by the Convention Secretariat.

Difficulties

The main constraints in the PAN/LCD-GRN process concern human and financial resources. The non-functioning of the cell has greatly slowed down the process of PAN/LCD-GRN adoption.

In 2002 the Global Environment Fund (GEF) portfolio of UNDP in Niger approved four projects in the pipeline,

namely the Lake Chad Programme; the Biodiversity Programme in the peripheral areas of the W National Park;[3] the National Biodiversity Programme; and ANCR (Auto évaluation nationale des capacités à renforcer, or National Capacity Self-Evaluation Development).

In 2003 Niger was admitted to the Small Grants Programme, or the Programme of Small Subsidies, which is designed to benefit NGOs, for funding based on national strategies. In December 2003, Niger and the United Nations System signed their annual workplans, which allows them to release the funds for activities

Special Programme of the President of the Republic

Niger's policy concerning the fight against poverty is based on certain areas, namely food security and the natural resource management. These two main objectives aim to decrease agro-ecological constraints while increasing agricultural production and productivity. The president has initiated his own programme for rural populations with an environmental component. This programme has been developed since 2000, and has as its purpose the solution of problems in the basic social sectors, that is, education, health, water, and sanitation. The main objective of this programme is directed essentially at rural populations and the fight against poverty. The resources are those of the retrocession of HIPC (Heavily Indebted Poor Countries) debt. Niger is the only country that puts all the resources it had received back for the benefit of the basic level of population. The environmental component consists of environmental education in rural circles and reforestation of the areas most affected by desertification. The rural populations are directly involved in the process, which immediately reduces the exodus phenomenon as they receive a daily wage. This also helps dramatically in the fight against poverty.

These contributions were formulated by participants in discussions in which the President's Special Programme was evaluated:

- Strengthen the capacity of villages to support the Ministry of Territorial Planning for completion and popularisation of the guidelines
- Emphasise the use of solar energy as a measure to combat desertification as a matter of survival
- Advocate for reducing the use of wood during the Tabaski festivities as an energy-saving measure
- In terms of renewable energy, take into account the development of solar energy infrastructures
- Develop synergy between the Programme de Lutte contre la Pauvrete (LUCOP) (Programme for the Fight against Poverty) and PNEDD concerning the land reclamation actions
- Develop synergy between the interventions of the Small-GEF project and the President's Special Programme
- Ensure better promotion of the hydrological map
- Encourage cooperation between the partners in the water sector to give greater visibility to the actions and promote the acquisition of Integrated Water Resources Management (IWRM)
- Programme the development of the IWRM national plan for 2007–2008
- Take into account the implementation of a plan of technical and financial cooperation of the partners in the Medium Term Programme (MTP)

PHYSICAL ACHIEVEMENTS

Reforestation and land restoration projects

The 2000–2004 Action Plan set out these objectives for land restoration:

- By 2004, recuperate 1 800 000 ha degraded land, which is 360 000 ha yearly
- Provide 30 million seedlings yearly between 2000 and 2004
- Reforest 395 000 ha between 2000 and 2004.

The strategy of implementing this policy of combating desertification is based on these tasks:

- Reforestation with economically profitable species
- The promotion of forest products such as gum arabic, and neem fruit (for the production of pesticides)
- Water and soil conservation and soil restoration
- Allocation of resources consistent with the fight against desertification
- Mobilisation of all human resources (women, youth, military) for land recovery

Significant reforestation projects are taking place, particularly the Project for the Development of Natural Forest (Programme d'Action pour la Forêt Naturelle, PAFN), the Natural Resources Management Project (Programme de Gestion des Ressources Naturelles, PGRN), the Natural Resources Management Support Project (PAGRN), the Agro Silvo-Pastoral Project (PASP), the Tahoua Rural Development Project (PDRT), the Keita Integrated Project (PIK), the Lower Tarka Valley Project (PBVT), etc.

New programmes have also been started, among them the environmental restoration component of the Special Programme of the President (above), the Fight against Silting in the Niger River Basin Project (PLCE/BN), Support to Diffa Local Development (PADL), Community Action Programme (PAC), and LUCOP (Programme de

Table 2 Physical achievements between 2000 and 2006 in reforestation

Years	Financing Sources	Types of plantations					
		Block plantations (ha)	Linear plantations (km)	Land restoration (ha)	Settling dunes (ha)	Agro-forestry (ha)	Improvement plantations (ha)
2000	State	12,0	5,8	10,0	0,0	0,0	0,0
	Collectivities	160,8	9 432,3	7,6	30,5	0,0	0,0
	Project/ NGO	6 718,4	17 731,6	5 531,8	905,3	2 519,0	0,0
	Total	**6 891,2**	**27 169,7**	**5 549,4**	**935,8**	**2 519,0**	**0,0**
2001	State	3 910,0	4 405,8	2 256,4	214,2	0,0	75,0
	Collectivities	103,5	45,6	5,7	0,0	25,0	0,0
	Project/ NGO	1 966,8	1 328,2	5 425,0	182,3	2 947,8	3 087,8
	Total	**5 980,4**	**5 779,6**	**7 687,1**	**396,4**	**2 972,8**	**3 162,8**
2002	State	5 747,2	3 139,2	2 804,4	881,6	0,0	0,0
	Collectivities	444,7	189,3	86,9	125,4	0,0	0,0
	Project/ NGO	3 196,0	2 704,7	10 541,7	601,5	1 581,4	1 951,2
	Total	**9 387,9**	**6 033,2**	**13 433,0**	**1 608,5**	**1 581,4**	**1 951,2**
2003	State	7 714,5	2 754,7	3 990,7	1 098,5	0,0	10 250,0
	Collectivities	1 164,5	314,6	101,8	17,0	0,0	0,0
	Project/ NGO	8 119,7	1 742,3	5 930,0	160,0	0,0	443,1
	Total	**16 998,7**	**4 811,6**	**10 022,5**	**1 275,5**	**0,0**	**10 693,1**
2004	State	3 886,7	1 103,1	1 758,8	213,0	86,5	316,0
	Collectivities	364,8	174,0	53,9	0,0	112,5	0,0
	Project/ NGO	6 266,0	581,6	6 976,6	1 117,0	1 617,0	2 221,7
	Total	**10 517,5**	**1 858,6**	**8 789,2**	**1 330,0**	**1 816,0**	**2 537,7**
2005	State	3 982,5	908,3	16 508,5	1 101,0	250,0	1 050,0
	Collectivities	8 092,3	2 453,0	0,0	0,0	0,0	0,0
	Project/ NGO	3 967,6	48 689,0	4 076,9	181,9	0,0	839,5
	Total	**16 042,4**	**52 050,3**	**20 585,4**	**1 282,9**	**250,0**	**1 889,5**
2006	State	8 060,1	351,1	7 260,9	2 352,0	1 357,0	1 247,0
	Collectivities	36,6	5,2	2,0	0,0	9,0	0,0
	Project/ NGO	6 075,8	69,0	9 210,8	40,0	1 147,0	16,0
	Total	**14 172,5**	**425,3**	**16 473,7**	**2 392,0**	**2 513,0**	**1 263,0**
TOTAL	**State**	**33 312,9**	**12 667,9**	**34 589,6**	**5 860,3**	**1 693,5**	**12 938,0**
	Collectivities	**10 367,1**	**12 614,0**	**257,8**	**172,9**	**146,5**	**0,0**
	Project/ NGO	**36 310,4**	**74 606,0**	**47 692,7**	**3 188,0**	**9 812,2**	**8 559,3**
General Total		**79 990,4**	**99 887,9**	**82 540,2**	**9 221,1**	**11 652,2**	**21 497,3**

Source DE/ME/LCD

Lutte contre la Pauvreté). In the context of this plan, these actions were included:

- 7 534 ha of land restored
- 15 000 ha productive land and river basins protected downstream
- 750 ha settled dunes and more than 1 000 ha of protected basins
- 45 204 terraces created

Socio-economic impact

- Decrease the regional exodus of the youth
- Improve the economic situation of women (animals, carts, seeds, food purchase, schooling for children, etc)

Ecological impact

- Environmental rehabilitation
- Increase of the agricultural areas; pastures and grounds rehabilitations
- Rehabilitation of the wildlife and the biodiversity
- Plantations of gum trees, with economic value

Table 2 shows what was accomplished in the period 2000–2006. It breaks down as follows:

- 79 990,4 ha block plantations
- 99 887,9 km linear plantations, all the combined categories
- 82 540,2 ha rehabilitated land
- 9 221,1 ha consolidated dunes
- 11 652,2 ha agro-forestry and 21 497,3 ha improvement plantations in the forests.

RECOMMENDATIONS

These recommendations were formulated by the environmental group concerning the activities in the period 2007–2008.

- Give greater importance and adequate financial resources to environmental actions
- Give higher priority to reinforcing capacity in the areas of environment, water, and sanitation by allocating adequate resources
- Ensure the capitalisation of the results of the Integrated Water Resources Management (IWRM) approach experiment at the level of the Niger River / Liptako Gourma
- Ensure greater ownership of the IWRM approach and consideration of transboundary waters
- Reinforce the capacity of implementing the Medium Term Programme for better follow-up of the sector-based consultation on the environment
- Ensure greater synergy between the interventions of the Programme of Support of the Local Development and PS/PRN [in full] in environment management
- Reinforce the advocating capacity for the preservation and sustainable management of the environment, in particular in matters of wood energy
- Ensure the reinforcement of national capacities in matters of education and environmental accounting
- Ensure better following of the post Rio conventions for increased mobilisation of the resources for the environment
- Put into operation the regional environmental commissions; and for sustainable development, implement and strengthen their capacity to support of the villages in matters of governance in environmental and natural resources management; also crisis management
- Develop the IWRM national plan
- Intensify efforts to mobilise the partners to co-finance the GEF initiatives and guarantee UNDP resources as 'seed money'
- Intensify the abilities of the national institutions in matters of building on good practice and communication
- Foster a strategic partnership to improve the access to energy services

Niger has prepared its Second National Communication on climate change and variability, which is dedicated to the presentation of the national circumstances, aspects of the development policies related to the climate change, to the contribution of gas emissions to the greenhouse effect, to the study of vulnerability in the face of variability and climate change, adaptation, external aid, and national needs in order to implement the convention.

NOTES

1 MHE, 2005

2 PAN/LCD/GRN, 1998

3 The W National Park (French: W du Niger) is a major national park in West Africa situated around a meander in the River Niger which is shaped like the letter 'W'. The park includes parts of Niger, Benin and Burkina Faso, and is regulated by their three governments.

REFERENCES

Studies and reports

Etudes sur le projet de mise en oeuvre des interventions prioritaires du Programme d'Action National pour l'Adaptation aux Changements climatiques, PANA au Niger, Fev 2008, available at www.napa-pana.org/private/modules/knowledgebox/.../file.php (accessed 26 June 2009).

Seconde Communication Nationale sur les Changements Climatiques PNEDD/CNEDD/CAB/PM 2009-09-22

Bilan des réalisations en matière d'environnement et de lutte contre la désertification 2000-2006

Stratégie de Réduction de la Pauvreté et de Développement 2007-2011. Cabinet du Premier Ministre, Secrétariat Permanent de Stratégie de Réduction de la Pauvreté, Décembre 2006. Available at imf.org/external/pubs/ft/scr/2007/fra/cr0716f.pdf. (Accessed 26 June 2009).

Programme d'Actions pour l'Adaptation (PANA) aux changements climatiques. Cabinet du Premier Ministre, Conseil National de l'Environnement pour un Développement Durable, Secrétariat Exécutif du Conseil National de l'Environnement pour un Développement Durable Février 2006. Available at www.pnud.ne/PTA_2009/Environnement/PANA.pdf. (Accessed 26 June 2009).

Evaluation des actions environnementales, CNEDD, 2003. Available at bch-cbd.naturalsciences.be › ... › Documents › Vision.

INRAN: Catalogue nigérien des variétés de céréales et de légumineuses, 1994. Available at www.agecon.purdue.edu/staff/masters/ImpactCD/Etudes/Riz-Niger.doc. (Accessed 26 June 2009).

Comité Technique Permanent d'Evaluation et de Suivi du Taux de couverture des besoins en Eau Potable, Taux de couverture national des besoins en eau potable en milieu rural,

rapportés aux résultats définitifs du RGP/H 2001 actualisés au 31/12/2005. Ministère de l'Hydraulique, de l'Environnement et de la Lutte Contre la Désertification. Available *at* imf.org/external/pubs/ft/scr/2007/fra/cr0716f.pdf. (Accessed 26 June 2009).

Etude de faisabilité portant création d'un Partenariat National de l'Eau (PNE) au Niger, Direction des Ressources en Eau Ministère de l'Hydraulique, de l'Environnement et de la Lutte Contre la Désertification, Mars 2005. Available at metameta.nl/governance/docs/pdf/.../Niger_Scorecard.pdf (Accessed 26 June 2009).

Révision de la Stratégie de Réduction de la Pauvreté- Rapport du Groupe Eau Potable, Assainissement, Cadre de Vie, République du Niger, Services du Cabinet du Premier Ministre, Secrétariat Permanent de la SRP Août 2006. Available at imf.org/external/pubs/ft/scr/2007/fra/cr0716f.pdf. (Accessed 26 June 2009).

Role of donor communities in addressing impacts of climate change in Africa

Asferachew Abate
Senior Environment Advisor, Ethiopia-Canada Cooperation Office, Addis Ababa, Ethiopia

INTRODUCTION

Climate change is not a new phenomenon. It has occurred several times in the past. Studies based on marine and lake sediments, ice cores, cave deposits and tree rings show evidence of climate change in the geological past. For example, studies and records reveal that over the last 100 million years the Earth's climate has been cooling down, moving away from the so-called greenhouse world of the Cretaceous Period, when dinosaurs enjoyed warm and gentle conditions.

In the past, climate change was driven mainly by natural forces (tectonic changes) and took up to 100 million years to happen. These tectonic changes included the opening of the Tasmanian-Antarctic Gateway and Drake Passage, which isolated Antarctica from the rest of the world, the uplift of the Himalayas, and the closure of the Panama Ocean Gateway.[1] There is also geological evidence that the cooling of the Earth in the past was accompanied by a massive drop in the level of atmospheric carbon dioxide. For instance, 100 million years ago, during the time of dinosaurs, atmospheric carbon dioxide levels could have been as much as five times higher than today.[2] Generally, the Earth has witnessed a number of ice-age cycles, caused primarily by changes in the Earth's orbit of the Sun.

Climate change is now predicted to occur at a much faster speed than it did in the past. Scientific evidence on climate change is presented in reports of the Intergovernmental Panel on Climate Change (IPCC).[3] These reports and other scientific findings indicate that climate change is happening and that the warming of the earth's atmosphere is attributable mainly to human activities.

Human activities since industrialisation have contributed to raising the concentration of greenhouse gases in the atmosphere. For example, since 1750 the concentrations of carbon dioxide, methane, and nitrous oxide have increased by 30 per cent, 145 per cent and 15 per cent respectively.[4] It was forecast that owing to the increase in the greenhouse gases, the mean global temperature might rise from 1 ˚C to 3,5 ˚C by the end of this century, higher than that experienced over the last 10 000 years. Such a rise in temperature will lead to changes in global atmospheric systems, shifts in climatic zones, shifts in extreme and mean weather conditions and sea-level rise. These are referred to jointly as the climate change phenomenon.

Climate change will bring serious challenges to the livelihood of human beings and the environment. Some ecosystems will be unable to cope with the rate of change. Climate change will exacerbate the frequency and magnitude of drought in some parts of the world, and food security will be affected. Coastal zones may also suffer considerably, and the lives and livelihood of human populations in coastal areas, arid and semi-arid areas, and cyclone-prone regions are particularly at risk.

Although Africa's contribution to climate change is small, it will probably suffer most as a result of climate change. There will be serious problems with food security and water shortage that could trigger serious conflicts among neighbouring countries. It is therefore timely for African countries to give the utmost priority to revisiting their policies, legal instruments and institutional arrangements to better adapt to climate change. It is also obligatory for developed countries to help Africa in its effort to mitigate and adapt to climate change. As indicated in the highly influential Stern Review on climate change, climate change is a serious and urgent issue[5] that should be tackled with strong coordination and collaboration of the world.

This paper briefly describes the most important impacts of climate change on Africa, outlines policies,

strategies and actions by some donors and recommends the potential role of donors to help African countries to cope with climate change impact.

IMPACT OF CLIMATE CHANGE ON AFRICA

Detailed studies on the impact of climate change on Africa are documented in IPCC reviews.[6] Africa is highly vulnerable to climate change because of frequent climate variability and poor socio-economic conditions. The most important impacts of climate change on Africa are summarised below. Understanding the impacts of climate change and their implications for conflict lays the foundation for resolving them.

Impacts on water resources

One of the devastating climate impacts of climate change will be changes in the frequency, intensity and predictability of precipitation.[7] Changes in precipitation will have a direct impact on agricultural production and hence on food security.

The impacts of climate change on availability of water in Africa appear to be region specific. For example, East Africa will experience warmer temperatures and a 5–20 per cent increased rainfall from December to February and 5–10 per cent decreased rainfall from June to August by 2050.[8] These changes are likely to occur in a sporadic and unpredictable manner. The increased precipitation will probably come in a few large rainstorms, mostly during the wet season, thereby adding to erosion and water management issues and complicating water management. There will possibly be less precipitation in East Africa during the dry season, which may cause more frequent and severe droughts and increased desertification in the region.

The decrease in availability of water affects not only agricultural production but also human consumption. Given that a large proportion of African rural and urban populations are already suffering from a shortage of safe drinking water, a limited water supply as a result of climate change will be a serious concern.

Shortage of water supply and its impact on food security will trigger regional conflicts, especially in internationally shared basins where there is a potential for conflict and a need for regional coordination in water management. Moreover, some predicted negative impacts of water on health, energy, and biodiversity could aggravate socio-economic problems in many African countries and result in unrest and conflicts. (Details of the impact of water stress and scarcity, as a result of climate change, are given in the IPCC 2008 technical report on climate change and water.[9])

Impact on food security

Africa depends heavily on rain-fed agriculture. Thus the livelihood of the population is strongly tied to climatic factors, and food security in Africa is highly vulnerable to climate variability such as shifts in the growing season.[10] Agriculture contributes a significant portion to many African gross domestic products (GDPs) and is the basis of the livelihood many households. African agriculture has already suffered from climatic variability and drought. For example, the impact of inter-annual climate variability on agricultural production in East Africa has been well documented.[11]

Food security is already a humanitarian crisis in Africa and is likely to be aggravated by climate change. Impacts of climate change on cereal production, fisheries and livestock are described in detail in the latest IPCC report.[12] For example, in Kenya a one-metre rise in sea level could affect the production of mangoes, cashew nuts and coconuts, causing losses of almost US$500 million a year.

But there will be better agricultural production in some pocket areas. For example, in parts of the Ethiopian highlands, the combination of higher temperatures and better rainfall may lengthen the growing season and boost agricultural production.

Impact on biodiversity

Africa is rich in biodiversity. The rapid rise in temperature owing to climate change, combined with destruction of habitats from land use, could result in the extinction of many species. That climate change is occurring much faster than in the past will leave no room for many species to adapt. In one of its technical reports[13] IPCC indicated significant extinctions in plant and animal species.

According to this report, more than 5 000 plant species could be impacted by climate change, owing mainly to the loss of suitable habitat. Some mammal species, such as zebra and nyala, which have been shown to be vulnerable to drought-induced changes in food availability, are widely projected to suffer losses. Similarly, drought-induced food shortage in the region would impair the migration success of many birds from Europe. IPCC 2007 also indicated that about 25–40 per cent of sub-Saharan African animal species in conservation areas will be endangered.[14]

Impact on health

Climate change is expected to exacerbate the occurrence and intensity of disease outbreaks and perhaps increase the spread of diseases in many African countries. Climate

variability and extreme weather events, such as high temperatures and intensive rainfall events, are critical factors in initiating malaria epidemics, especially in the highlands of western Kenya, Uganda, Ethiopia, Tanzania, Rwanda and Madagascar.

Concurrent with the poor supply of safe water, primary health coverage in Africa is minimal. This will aggravate vector- and water-borne diseases in many countries where health infrastructure is inadequate.

Climate change could also interact with other background stresses and additional vulnerabilities such as HIV/AIDS and conflict in the future, resulting in increased susceptibility and risk of other infectious diseases (eg cholera) and malnutrition. The potential of climate change to intensify or alter flood patterns may become a major additional driver of health risks from flooding. The probability that sea-level rise could increase flooding, particularly on the coasts of eastern Africa, may also have an implication for health.

Impacts on coastal areas

Coastal areas in Africa will be affected by the rise in sea level. Important economic activities that could be influenced by sea-level rise include tourism, mining and fisheries. Warm sea surface temperatures, extreme weather events, and sea-level rise could lead to the destruction of coral reefs, which absorb the energy of ocean swells.[15]

Mangroves along coastal areas serve as a buffer against storm surges by providing protection from the erosion and rising tides associated with sea-level rise. However, mangroves are under threat from deforestation, coastal erosion and extreme weather, and have been identified as the most vulnerable species to sea-level rise and inundation.[16] Sea-level rise is also threatening the availability of freshwater by causing salt-water intrusion in some countries.

Furthermore, sea-level rise could endanger settlements in marginal areas. For example, a 1-metre rise in Eritrea would cause damage of over US$250 million as a result of the submergence of infrastructure and other economic installations in one of its port cities, Massawa.[17]

Exacerbating desertification

Desertification is a serious problem in Africa. Desertification has reduced by 25 per cent the potential of vegetative productivity of more than one-quarter of the continent's land area.[18] Though the relative importance of anthropogenic and climatic factors in causing desertification remains unresolved, there is ample evidence that climate change will exacerbate desertification. The expansion of desertification will have a direct impact on the livelihood of many communities.

FINANCING CLIMATE CHANGE: THE ROLE OF DONORS

The need to respond to the threat of climate change has become an increasingly important international policy concern, particularly since those likely to be affected soonest and most severely are the poorest people in developing countries.[19] There is also increasing concern that climate change will put recent gains in the fight against poverty, hunger and disease, and the lives and livelihoods of billions of people at stake. Furthermore, because of the impacts of climate change on water and food security, increased global attention is being given to the links between climate change and violent conflict.

Existing sources of global finance to address climate change include national government spending, national private sector spending, foreign direct investment, international debt and official development assistance (ODA). Though ODA funds are currently less than 1 per cent of global investment,[20] they provide considerable resources for developing countries, because ODA targets poor aid-receiving countries that are most vulnerable to climate change.

ODA includes several funding streams to channel finances to developing countries to help them address climate change issues. These include:

- The UN system, such as UNEP and UNDP
- The financial mechanism of the Rio Conventions, specifically the Global Environmental Facility (GEF)
- Multilateral development banks, such as the World Bank
- Bilateral ODA, such as CIDA

At present, the GEF is the multilateral body designated to house financing mechanisms to meet country obligations on the UNFCC. GEF is governed jointly by donors and recipients. Most ODA funds for climate change are channelled through GEF. The World Bank, besides channelling funds through GEF, has a standalone fund for climate change.

Finance for climate change is intricately linked to mitigation, adaptation and technology transfer. A brief description of the policies, strategies and actions of major international financing organisations is given below.

United Nations

The United Nations (UN) was established in 1945. Its purpose is to 'maintain international peace and security; to develop friendly relations among nations; to cooperate in solving international economic, social, cultural and humanitarian problems and in promoting respect for human

rights and fundamental freedoms; and to be a centre for harmonizing the action of nations in attaining these ends'. Given the potential of climate change to trigger conflicts among neighbouring countries, particularly in Africa, addressing climate change is now central to the work of the UN. UN Secretary-General Ban Ki-moon has made climate change one of the three priorities for the UN System, and is tirelessly championing 'the defining challenge of our age'.[21]

Of several agencies in the UN, the United Nations Environment Programme (UNEP), created in 1972, has a notable role in helping nations understand climate change and tackling its impacts. UNEP has been engaged in climate change issues for over 20 years. It helped establish the IPCC with the World Meteorological Organization (WMO) in the 1980s, and supported the negotiation of the United Nations Framework Convention on Climate Change (UNFCCC), which entered into force in 1994.[22] UNEP's strategy on climate change is structured around four themes: mitigation, adaptation, science, and communication.

Even with the most stringent mitigation measures, climate change is inevitable. This strongly calls for the need to develop effective climate change adaptation measures. UNEP has been active in supporting the preparation of national adaptation programmes of action (NAPA) through its partnership with UNDP.

For example, Ethiopia finalised the preparation of its NAPA in June 2007 with financial support obtained by the GEF through UNDP. The Ethiopia NAPA document outlines the threat of climate change on social wellbeing, ecosystem and the economy. It also outlines potential climate change adaptation options and lists priority projects and activities.[23]

World Bank

The UN can encourage cooperation and promote awareness of environmental problems, but the World Bank holds the purse strings. Established in 1944 and based in Washington DC, the World Bank is one of the world's largest sources of funding for economic development. The bank can shape environmental policy through funding development programmes and projects.

Cognisant of the need for a concerted and unprecedented global cooperation across borders, the bank developed strategies to address impacts of climate change in developing countries. The bank has strengthened and established climate change partnership with many governments and a wide array of organisations.

The bank, in cooperation with other international financial institutions, developed the Clean Energy Investment Framework.[24] The framework identified the scale of investment needed for countries to access energy, especially in Africa; to help their transition to a lower carbon development path; and to adapt to climate variability and change.

The bank has developed a strategic framework on development and climate change that uses a demand-based approach to identifying and tapping new business opportunities for developing countries and helping them cope with new risks. The strategy aims at supporting development successes while offsetting costs that stem from climate change through climate-dedicated finance. The bank strategy highlights the need for action and interaction among all countries for the greater global good.[25]

To address impacts of climate change on health, water supply and sanitation, agriculture and disaster and management, the bank has several projects under way to strengthen the knowledge base for climate change and to translate such insights into informed decision making.[26] The World Bank official website states that the 2010 edition of the World Development Report will focus on development in a changing climate. Furthermore, climate change adaptation considerations are being integrated into the bank's country assistance strategies. A new screening tool gives a simple way of assessing development projects for potential sensitivities to climate change and further work is being done on sector-specific tools and guidance. The bank is also piloting innovative climate risk insurance. The Global Facility for Disaster Risk Reduction and Recovery, which helps countries integrate disaster planning into their development strategies, has been piloted in various countries.

Canadian International Development Agency

An early Canadian contribution to climate change adaptation was the CAD 100 million Canada Climate Change and Development Fund (CCCDF) – administered by the Canadian International Development Agency (CIDA) – which began in 2000 and expired without renewal in 2006. The purpose of the CCCDF was 'to promote activities addressing the causes and effects of climate change in developing countries, while helping to reduce poverty and promote sustainable development', mainly through CIDA-administered projects. CIDA is still guided by the 1992 Environmental Sustainability Policy, which urgently requires updating to include the incorporation of climate change considerations.

CIDA recognised long ago the need for cooperation among countries to resolve conflicts that could arise as a result of transboundary water basins. The Technical Cooperation Committee for the Promotion of the Development and Environmental Protection of the Nile

Basin (TECCONILE) was supported financially by CIDA in 1993. This initiative and subsequent support by CIDA resulted in a series of conferences that provided the forum for dialogue among the Nile Basin countries.

After these series of dialogues and understandings, the Nile Basin Initiative (NBI) was launched in which CIDA played a significant role, along with other international donors. Although the NBI (which is supported by a number of international donors) has perhaps not made progress at the rate that many in the region would like, it has served as an important forum for airing grievances before tensions descend into violence. Continued preference for diplomatic solutions over the use of force will be the key to ensuring that the Nile water does not become a cause of future conflict, aggravated by climate change.

THE ROAD TO COPENHAGEN CLIMATE SUMMIT

In 1992, the UN convened the Conference on Environment and Development, commonly known as the Earth Summit, in Rio de Janeiro. Nations represented at this conference signed five documents, including the UNFCCC. The UNFCCC outlined a plan for reducing greenhouse gas emission to 1990 levels by 2000, through a voluntary nation-by-nation approach. By the late 1990s it was apparent that this approach was not likely to succeed. Between 1990 and 2003, for example, the US emission of greenhouse gases (in CO^2 equivalent) increased by 13,3 per cent.[27]

After increasing evidence that climate change is eminent and the refusal of most industrialised countries to decrease their emissions, efforts began to create a binding international treaty that would require all signatory nations to reduce these emissions. This effort led to the development of the Kyoto Protocol.

The UNFCCC is the basis for the Kyoto Protocol. This protocol, drafted in 1997 in Kyoto, Japan, mandates signatory nations to reduce emissions of six greenhouse gases to levels equal to or lower than those of 1990 by 2008–2012. The treaty took effect after nations responsible for 55 per cent of global greenhouse emissions had ratified.

The Kyoto protocol therefore came into force after it was ratified by Russia in 2005 and will expire in 2012. Delegates from 200 countries will gather in Copenhagen to negotiate a more binding agreement on climate change. There is increasing willingness by many countries to cut greenhouse gases drastically..

Africa ready for Copenhagen summit

Though Africa's contribution to climate change is negligible, it will be affected severely by climate change. Food insecurity, water shortage and associated conflicts and extreme weather conditions as a result of climate change will have negative impacts on Africa's socioeconomic conditions. Africa therefore should get the necessary support from developed countries to withstand impacts of climate change.

The African Union (AU) underscored the need for Africa to draft a common demand that the continent's interests should be taken into account at the Copenhagen Summit. According to Jean Ping, chairperson of the AU Commission, it is time for Africa to aggressively engage in the Copenhagen Summit to ensure that its concerns in this new international climate change agreement are effectively addressed.[28]

The AU has confirmed that Africa will be represented in Copenhagen by one delegation, known as the Conference of African Heads of State and Government on Climate Change (CAHOSCC), and empowered to negotiate on behalf of all member states, with the mandate to ensure that resource flow to Africa is not reduced.

The delegation is composed of representatives from Algeria, Congo-Brazzaville, Kenya, Uganda, Ethiopia, Nigeria, Mauritius, and Mozambique, with AU chief Jean Ping, and AU chairman and Libyan leader Muammar Gaddafi, as well as the chair of African Conference of Ministers in charge of the Environment on Climate Change , represented by South Africa. The prime minister of Ethiopia, Meles Zenawi, will lead the delegation and represent the AU at the conference.

A proposal is being prepared on the African demand for compensation. African experts on climate change and high-level representatives of AU member states have recommended that Africa demand between US$67 billion and US$200 billion annually in compensation. According to Africa's position paper, presented at the African Partnership Forum meeting in Addis Ababa on 3 September 2009, the continent requires huge financial support (estimated at US$300 million) and technology transfer from the developed countries for mitigation and adaptation activities to curb the impact of climate crisis on the continent.

CONCLUSION AND THE WAY FORWARD: A TWO-PRONGED APPROACH

Donors should continue to implement their two-pronged approach in tackling problems of climate change in Africa. The focus should therefore be on supporting programmes and projects that will help countries to mitigate and adapt.

Mitigation measures

Donors can finance African countries to afforest their degraded lands. Such afforestation programmes and

projects should give priority to forest tree species that can sequester atmospheric carbon dioxide more efficiently.

In addition to these projects, donors should help local communities to enhance their capacity to manage existing forests sustainably. For example, building the capacity of local governments and communities to benefit from non-timber forest products (gum, honey, spices and tourism) and conserve the natural forests which could have huge potential in storing carbon in their plant biomass and soils is a good strategy.

Donors should encourage policies that ensure the development of environmentally friendly industries in African countries. Furthermore, strong support should be given to encourage African governments to promote energy efficient household appliances and vehicle.

Donors should support African countries to develop their renewable natural resources, for example environmentally sound hydroelectric dam, wind energy and geo-thermal energy. Until countries reach a stage where they use renewable energy sources, development and use of energy-efficient cooking stoves should be encouraged.

Adaptation measures

Integrating climate change adaptation into donor programmes and projects

Environmental factors have a direct link to the livelihood of many African households. Poverty reduction and the ability of households to withstand climate change are highly correlated with good environmental management and the socioeconomic status of households. Thus promoting development programmes and projects that will improve environmental management and make households and communities more resilient to climate change is a timely issue for donors.

Ongoing donor programmes and projects should increase the capacity of individuals, households and communities to respond to climate change. Many programmes and projects are being conducted to reduce poverty and enable households to be food self-sufficient. These programmes should be refined to address climate change adaptation mechanisms in their activities.

Furthermore, donors' new programmes and projects on environmental rehabilitation and livelihood improvement should include climate change activities.

Support networking and joint forum

The impacts of climate change are complicated to address. It is therefore of paramount importance for all actors in this area to make a concerted effort to address climate change impacts effectively. Though there is increased awareness of this, collaborative efforts by principal actors at country and continental level are limited. Donors should play a positive role by creating forums for state and non-state actors.

Support generation of accurate and specific information on climate change

The implications of climate change for Africa's development must be fully understood by donor communities and African countries. Policy makers in African governments need to be aware of country-specific climate impacts, and subsequently implement sustainable development that maximises the benefits of climate change while minimising its risks. To help increase governments' understanding of climate change impacts, national institutions should monitor and predict climate change, and provide useable, timely and accurate information to governments, donors, NGOs, commercial organisations and the public. Thus, donors should help to build the capacity of national institutions in Africa to predict and monitor how climate change will affect African countries.

Integrate climate change into national planning

Climate change needs to be fully integrated into appropriate national sectoral and cross-sectoral policies and strategies. These include land and water management, agriculture, rural development, health and education. For example, an already water-scarce country that is anticipating a decline in rainfall as a result of global warming must take this into account in its water resource management strategy (this may involve developing new water sources and infrastructure to mitigate the effects of drought) and its agricultural policies (which must seek to increase food security).

The capacity of African countries to integrate environmentally sound programme and project management should be enhanced. Recent assessment on the capacity of African countries to implement environmental impact assessment (EIA) and strategic environmental assessment (SEA) revealed that donors should do a lot to boost the capacity to implement these assessments.

Improve early warning systems

The impact of disaster on human wellbeing and the natural environment can be lessened if an appropriate disaster prevention plan is in place. Despite Africa's huge exposure to disaster, institutional capacity in disaster prevention in most African countries is still rudimentary.

Given that disaster risk reduction is a vital component of adaptation to climate change, donors should assist African countries technically and financially to build their capacity to prevent disaster. Negative impacts of extreme weather events can be dramatically reduced with

appropriate preparedness at national level. Disaster risk reduction is often cost effective: the World Bank calculated that economic losses worldwide from climate-related disasters in the 1990s could have been reduced by US$280 billion by investing just a seventh of that sum in disaster preparedness.

NOTES

1 Mark Maslin, *Global warming: A very short introduction,* Oxford: Oxford University Press, 2009.

2 Maslin, *Global warming.*

3 For example IPCC, *The scientific basis,* Cambridge: Cambridge University Press, 2001; and IPCC, *The physical science basis,* Cambridge: Cambridge University Press, 2007.

4 IPCC, *The physical science basis.*

5 Nicholas Stern, *The economics of climate change, The Stern Review.* Cambridge: Cambridge University Press, 2006.

6 For example, IPCC, *The scientific basis*; and IPCC, *The physical science basis.*

7 IPCC, *The physical science basis.*

8 According to M Hulme, R Doherty, T Ngara et al, African climate change:1900–2100, *Climate Research* 17 (2001), 145–168; and IPCC, *The scientific basis.*

9 IPCC, *Climate change and water: IPCC technical paper VI.* Geneva, Switzerland: IPCC, 2008.

10 IPCC, *The scientific basis.*

11 WWF (World Wide Fund for Nature), *Climate change in East Africa: A review of the scientific literature*, Gland, Switzerland: WWF, 2006.

12 IPCC, *The physical science basis.*

13 IPCC, *Climate change and biodiversity: IPCC technical paper VI,* Geneva, Switzerland: IPCC, 2002.

14 IPCC, *The physical science basis.*

15 IPCC, *The scientific basis.*

16 IPCC, *The scientific basis.*

17 According to IPCC, *The physical science basis.*

18 According to UNEP, *Climate change strategy*, Kenya, Nairobi, 2009.

19 IPCC, *The physical science basis.*

20 Available at http://unfccc.int/2860.php, accessed August 2009.

21 UNEP, *Climate change strategy.*

22 UNEP, *Climate change strategy.*

23 NMA (National Meteorological Agency), *Climate change national adaptation program of action (NAPA)*, Addis Ababa, Ethiopia: NMA, 2007.

24 Available at *beta.worldbank.org/overview,* accessed August 2009.

25 Ibid.

26 Ibid.

27 IPCC, *The physical science basis.*

28 Afronline, The Voice of Africa, available at www.afronline.org, accessed 31 January 2010.

Conclusion, recommendations and the way forward

Today, there is growing recognition among the Nile riparian states that the Nile is a source of sustenance for the ten countries, and that adaptation to and mitigation of the impact of climate change cannot be effective if done unilaterally, by any country alone. The assumption is that climate change, by virtue of being an equal threat to all, is expected to inspire and draw all Nile riparian countries to cooperate. Unpredictable rainfall as a result of climate change, and lack of water management, with its attendant consequences, such as drought and crop failure, are making food security impossible in this region. The conference brought more than thirty five participants to Mombasa. The distinguished speakers represented the ministries of water resources of Ethiopia, Egypt, Kenya and Uganda. In the debates at the conference, speakers expressed support and encouragement for building consensus on cooperation by the riparian states. As suggested, this consensus stated the political commitment of the riparian states to cooperate and served as an overarching framework for the policies and instruments of all ten countries.

The need for more dialogue among the Nile riparian states, which will lead to a win-win solution, was agreed upon at the meeting. More coordination among the actors involved in transboundary water conflicts – be it on the policy-setting level or the implementation level – would bring more efficiency and better understanding among the riparian states. In addition, given the degree of mistrust characterising the Nile riparian states, the need for confidence building among these states was also recommended.

Moreover, the conference emphasised that rapid climate change, degraded ecosystems, and scarcity of food, water and energy will outlast the serious economic downturn in Africa. Some crises can be reversed, but the damage to climate and ecosystems that contain and support all life may be beyond repair and contribute negatively to economic prosperity in Africa.

The intensity of and interest in the debates were signs not only of the importance of cooperation and effective policy making, but also of the growing strength of the riparian states' ability to develop and protect their environment.

PARTICIPATION OWNERSHIP

- Participate in open discussion to reach a comprehensive win-win agreement to prevent inter-state conflict
- Revise the statutes and build strong riparian cooperation and coordination on transboundary activities
- Work together as member states to address climate change issues because they require regional and transboundary approaches
- NBI to coordinate with other regional basin organisations and AU to address the issue of climate change at continental level
- Integrate towards international agreement and real commitment, respect and trust of one another by riparian states
- Seek a political solution and bilateral agreement
- Establish joint permanent commissions or a forum; negotiate the subject at senior official level
- Use the AU initiative for the effective and final demarcation of African borders, which should sound a death knell to this recurrent odyssey, as another instrument to handle this case
- Increase the awareness of the people of the impact of sea-level rise and climate change
- Develop response strategies that include shore protection, erection of different types of sea walls, and flood hazard regulation

- Formulate policies on transboundary resources at government level
- Develop alternative models of cooperative management for adaptation to the future Nile River Basin Commission. These will be sustainable only if they meet the requirements of equity for all riparian countries; and joint protection of the environment in an integrated manner to assist in the sustainability of the basin
- Make climate change and transboundary issues public issues
- Establish an open, transparent, and accountable policy and decision making process
- Set up virtual water trade among the Nile Basin countries
- Involve all stakeholders (local authorities, companies, NGOs, researchers, etc) in dealing with water
- Develop a new paradigm
- Strengthen basin institutions and regional economic communities
- Align climate change positions and positions on transboundary waters
- Align national policies
- Offer incentives for complying with international water law
- Encourage the establishment of basin authorities
- Develop governmental bodies, at national and local level, whose work directly or indirectly affects water resource management, including policies and plans for land use, environmental protection and conservation, economic development and trade
- Increase knowledge base and technical expertise, including developing assessment indicators and increasing the quality of information available
- Explore and encourage indigenous coping mechanisms
- Coordinate, collaborate and integrate awareness creation, sensitisation programmes and campaign, at national and international levels including harmonisation of donor strategies
- Adopt a conflict sensitive 'do no harm' philosophy and 'be your brother's keeper' approach that will encourage sharing and mutual benefits to all concerned
- Develop a coordinated, harmonised and integrated approach by donor communities on establishing a climate adaptation and mitigation strategy
- Develop a climate policy that maintains a balance between mitigation and adaptation solutions that limit the overall impacts of climate change
- Intensify efforts to promote emission reduction and use alternative means to satisfy energy needs, for example wind and solar energy to generate steam and run turbines to generate power
- Promote women's involvement in the water sector, using a gender analysis framework to understand how policies and programmes impact women and men of different classes and economic backgrounds
- Involve civil society organisations in creating awareness, facilitating inter-group dialogues and developing a framework for water management
- Initiate steps to incorporate climate change in school curricula
- Organise bilateral talks to minimise or avoid misunderstanding by involving a third party for a durable solution

To African Union member states

- Develop new and support existing research capacity
- Conduct research on the socio-political impact of climate change
- Formalise, adopt and implement national climate change policies
- Share climate change adaptation and mitigation technology
- Improve the role of the private sector through public-private partnerships (PPPs)
- Improve capacities to respond to climate change such as the enhancement of coastal defences (coastal states)

To the African Union

- Encourage normative commitment and develop a comprehensive response to climate change
- Improve AU environmental governance structures
- Adopt a general framework and plan of action on climate change, including standards
- Establish a climate change directorate
- Amend the African Peer Review Mechanism (APRM) to include response to climate change by member states
- Institute environmental peace building
- Foster international collaboration
- Improve climate change diplomatic practice
- Improve early warning mapping
- Cooperate with regional organisations
- Improve public awareness and civil society involvement via the Economic, Social and Cultural Council (ECOSOCC)

Rehabilitate and adapt these issues

- Improve degraded areas with afforestation
- Support sustainable management of existing forests
- Encourage the development of environmentally friendly technologies
- Support the development of renewable energy resources
- Integrate climate change adaptation into donors' programmes and projects

- Support networking and joint forums
- Support the generation of accurate and specific information on climate change
- Integrate climate change into national planning
- Improve early warning systems
- The problems of mitigating transboundary conflicts over unregulated usage of shared water resources are critical in the IGAD region since currently there are no laws regulating these resources or customary regimes
- Develop the capacity in technical institutions to support governments and communities in their adaptation to climate change
- Institute capacity building and adaptation projects and programmes, with support from the international community

This report on the main issues discussed at the workshop will be published and disseminated widely among all interested parties. It will also be made available to the African Union Commission, AU member states, the diplomatic community and international organisations in order to provide impetus for the idea of integrated climate change and transboundary water resources for Africa and to drive the process forward.

Appendices

Appendix A – Programme

Appendix B – List of participants

Appendix A

Programme

Day 1: Monday, 28 September 2009	
	Arrival
08:00	**Dinner/Socialisation**

Day 2: Tuesday, 29 September 2009	
09:00–09:15	**Registration**
09:15–09:30	**Opening session: Welcome and introduction** Mr Roba Sharamo *Acting Director/Programme Head, Institute for Security Studies, Addis Ababa, Ethiopia*
09:30–09:45	**Keynote address** Honorable Charity Ngilu *MP Representative of Kenya's Ministry of Water & Irrigation, Kenya, represented by Mr John Rao Nyaoro, Director of Water Resources, Ministry of Water and Irrigation*
09:45–10:15	**Coffee break and workshop photograph**
10:15–13:00	**Session I:** **Current conflict and cooperation on transboundary water resources: The case of the Nile River Basin** Chair: HE Ambassador Guillaume Nseke *Permanent Representative to the AU and UNECA*
10:15–10:40	**Review of early experiences, current challenges and opportunities among the Nile Basin riparian states** Dr Debay Tadesse *Senior Researcher, Institute for Security Studies, Addis Ababa, Ethiopia*
10:40–11:05	**Sustainable transboundary basin development as a strategy for climate change-induced conflict prevention: Reflections from Eastern Nile** Dr Salah Shazali *Senior Operations Officer, Nile Basin Initiative*
11:05–11:30	**Assessing regulation of international water utilisation in Africa** Dr Tom O Okurut *Executive Secretary, Lake Victoria Basin Commission*
11:30–11:55	**Kenya's experience in managing climate change and water resource conflicts: the Case of Gibe I, II, III** Mr Silas Mnyiri *Ministry of Water and Irrigation, Nairobi, Kenya*
11:55–12:20	**Water and food security in the Nile River Basin: Legislative and institutional arrangements for cooperation** Dr Kithure Kindiki *Associate Dean School of Law, University of Nairobi*
12:20–13:00	Discussion

13:00–14:00	**Lunch**
14:00–16:40	**Session II:** **The role and the experiences of African governments and intergovernmental agencies in addressing climate change and managing transboundary water conflicts** Chair: Mr Michael A Oyugi *Deputy Head of Mission, Kenya Embassy, Addis Ababa, Ethiopia*
14:00–14:25	**Challenges of Cooperation on the Nile River: An Ethiopian perspective,** Mr. Minelik Alemu Getahun represented by Mr Henok Teferra *Advisor in the Minster's Cabinet, Ministry of Foreign Affairs, Ethiopia*
14:25–14:50	**Role of government in preventing climate change induced water resources conflicts: An Ethiopian perspective** Ato Fekahmed Negash *Heads of Basin Development Studies and Water Utilization Control Department, Ministry of Water Resources, Ethiopia*
14:50–15:15	**The role and experiences of Egypt in managing transboundary water conflicts** HE Ambassador Marawan Badr *Office of the Minister of International Cooperation, Egypt*
15:15–15:40	**Transboundary water conflicts: The experience of Egypt in actualising water and environmental ethics** HE Ambassador Dr Magdy A Hefny *Director of the Regional Centre for Research and Studies of Water Ethics, Ministry of Water Resources & Irrigation, Egypt*
15:40–16:40	Discussion
19:00	**Reception**
20:00	**Dinner**

Day 3: Wednesday, 30 September 2009	
08:30–09:00	**Breakfast**
09:00–13:15	**Session III:** **Climate change in Africa: Legal, policy and institutional challenges** Chair: Dr Paul Goldsmith *Nairobi, Kenya*
09:00–09:25	**The role and the experiences of IGAD in managing climate change and transboundary water conflicts in IGAD region** Mr Kizito Sabala *Political Officer, IGAD-Liaison Officer, Nairobi*
09:25–09:50	**The role and the experiences of ECOWAS in managing climate change and transboundary water conflicts in ECOWAS region** Mrs Raheemat Omoro Momodu *ECOWAS Liaison Officer, African Union*
09:50–10:15	**The role and the experiences of CEN-SAD in managing climate change and transboundary water conflicts in CEN-SAD region** Mrs Wafa Essahli *CEN-SAD Director in Charge of Rural Development*
10:15– 11:10	Discussion
11:10–11:25	Coffee Break
11:25–11:50:	**African governments, the AU and regional economic communities' response to climate change in Africa** Ms Jo-Ansie van Wyk *Department of Political Science, University of South Africa (UNISA)*
11:50–12:15	**The challenges of climate change and transboundary resources in Eastern Africa** HE Ambassador Idule Amoko *Uganda Embassy, Addis Ababa, Ethiopia*
12:15–12:40	**Natural resource scarcity and pastoral conflict in Africa under climate change** Dr Wario R Adano *School of Environment Studies, Moi University, Nairobi, Kenya*
12:40–13:15	Discussion
13:15–14:15	Lunch
14:15–17:30	**Session IV:** **Climate change and natural resource conflicts in Africa** Chair: Dr Tom O Okurut *Executive Secretary, Lake Victoria Basin Commission*

14:15–14:40	**Natural resource conflicts in West Africa: The case of Niger River Basin** Dr Lulsegged Abebe *Manager, International Alert, West Africa Programme*
14:40–15:05	**Climate change and transboundary water conflicts in Lake Chad region: The case of Nigeria and Cameron** HE Ambassador Guillaume Nseke *Permanent Representative to the AU and UNECA*
15:05–15:30	**Migingo Island: Sources of conflict, approaches and assessment of intervention efforts by Kenya and Uganda** Mr Michael A Oyugi *Deputy Head of Mission, Kenya Embassy, Addis Ababa, Ethiopia*
15:30–15:55	**Assessing climate change and desertification in West Africa: The Niger experience in combating desertification in the region** Dr Amadou Sonrhai Oumarou *Embassy of Niger to Ethiopia, Councillor, Addis Ababa, Ethiopia*
15:55–16:20	**The role of donor communities in addressing the impact of climate change in Africa** Dr Asferachew Abate *Senior Environment Advisor, Ethiopia-Canada Cooperation Office, Addis Ababa, Ethiopia*
16:20–17:00	Discussion
17:00–17:30	**Conclusion, recommendations and the way forward** Dr Debay Tadesse *Senior Researcher, Conflict Prevention Programme, Addis Ababa, Ethiopia*
19:00	Dinner

Day 4: Thursday, 1 October 2009	
	Departure

Appendix B

List of participants

No	Name	Organisation	Contact details
1	Dr Wario R Adano	School of Environmental Studies, Moi University, Nairobi, Kenya	Tel 254(0) 5343013 Cell +254 726 955 687 wradano@yahoo.com
2	Mr Silas Mnyiri	Minister of Water Resources, Nairobi, Kenya	silasmutia@yahoo.co.uk
3	Dr Asferachew Abate	Senior Environment Advisor, Ethiopia-Canada Cooperation (ECCO)	Tel 251 113 715600 asferachew.abate@cida-ecco.org
4	Mr Fekahmed Negash	Head of Basin Development Studies and Transboundary, Ministry of Water Resources, Ethiopia	Tel: 251+0116 62 64 35 abbaybasin@ethionet.et
5	HE Ambassador Guillaume Nseke	Permanent Representative of the Organisation Internationale de la Francophonie to the AU & UNECA, Addis Ababa, Ethiopia	Fax +251 11 372 95 14 Tel +251 11 371 74 77 Cell +251 91 120 9051 oif-rpa@ethionet.et nesekeguy@yahoo.fr
6	Mr Henok Teferra	Advisor in the Minister's Cabinet, Ministry of Foreign Affairs, Ethiopia	Cell 251 910 019766 henok.tef@gmail.com
7	HE Ambassador Idule Amoko	Deputy Head of Mission to Republic of Uganda to Ethiopia, Djibouti and the Permanent Representative to the AU, UNECA and IGAD Addis Ababa, Ethiopia	Tel +251 11 551 3088 / 551 3531 14 Fax +251 11 551 43 55 amok@yahoo.com
8	Ms Jo-Ansie van Wyk	Department of Political Science, University of South Africa (UNISA)	vwykjak@unisa.ac.za
9	Mr John Rao Nyaoro	Director of Water Resources, Ministry of Water and Irrigation, Nairobi, Kenya	Tel + 254 20 2093925 Cell + 254 722 820485 Fax + 254 20 2727622 jrnyaoro@yahoo.com
10	Mr Kizito Sabala	Political Officer, IGAD Liaison Office, Nairobi	Tel 254 20 374 2240/ 375 2539 sabalakizito@hotmail.com
11	Dr Kithure Kindiki	Associate Dean, School of Law, University of Nairobi, Kenya	kkindiki@yahoo.co.uk PO Box 30197-00100
12	Dr Lulsegged Abebe	International Alert Manager, West Africa Programme	Tel +44(0) 20 7627 6834 labebe@international-alert.org
13	HE Ambassador Dr Magdy A Hefny	Director, Ministry of Water Resources & Irrigation, Egypt	Tel +251 202 44467975 Cell +251 202 010 5007615 mhefny14@hotmail.com

No	Name	Organisation	Contact details
14	Lt Col Mangondza Godelin Medrad	ECCAS Liaison Officer African Union Addis Ababa, Ethiopia	Tel: +251 0913 542934 mangondzagm@yahoo.fr
15	HE Ambassador Marawan Badr	Ministry of International Co-operation, Egypt	Tel 23902645 / 2391008 amb.badr@gmail.com
16	Mr Michael A Oyugi	Principal and Councillor/ Deputy Head of Mission, Embassy of Kenya	Tel 251 11 661 00 33 Fax 251 11 661 14 33 mikeoyugi@yahoo.com
17	Dr Oumarou Amadou Sonrhai	Embassy of Niger to Ethiopia, Councillor, Addis Ababa Ethiopia	amadou_sonrhai@yahoo.fr
18	Dr Paul Goldsmith	Development Management Policy Forum, Nairobi, Kenya	Tel 254 722 845 799 usama@wananchi.com
19	Ms Raheemat Omoro Momodu	ECOWAS Liaison Officer, African Union	Tel +251 0910 162065 raheemat@hotmail.com
20	Dr Sahal Shazali	Senior Operation Officer, Nile Basin Initiative	
21	Dr Tom O Okurut	Executive Secretary, Lake Victoria Basin Commission	Tel 254-57-2023873/894 Cell 254-736964697 okurut@lvbcsec.org or tookurut@yahoo.co.uk
22	Dr Amadou Sonrhai Oumarou	Ambassade Du Niger en Ethiopie, Conseiller	Tel 251 11 465 1305 Home 251 11 325 5107 amadou_sonrhai@yahoo.fr
23	Mrs Wafa Essahli	CEN-SAD Director in Charge of Rural Development	w.essahli@cen-sad.org
24	Ashitiya Dan	National Environment Management Authority, Kenya	Email: danashitiva@yahoo.com
25	Mr Roba Sharamo	Acting Director/Programme Head, Institute for Security Studies, Addis Ababa, Ethiopia	Tel +251-11-3721154 Fax +251-11-3725954 rsharamo@issafrica.org
26	Dr Debay Tadesse	Senior Researcher, Institute for Security Studies, Addis Ababa, Ethiopia	dtadesse@issafrica.org
27	Ms Ledet Teka	Intern, Institute for Security Studies, Addis Ababa, Ethiopia	lteka@issafrica.org
28	Mrs Beakal Bisrat	Programme Administrator, Institute for Security Studies, Addis Ababa, Ethiopia	bbisrat@issafrica.org