The Hydropolitics of Africa

The Hydropolitics of Africa
A Contemporary Challenge

Edited by

Marcel Kitissou, Muna Ndulo,
Mechthild Nagel and Margaret Grieco

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Preface

This volume brings together specialist reflection on the hydropolitics of Africa. It is the outcome of a specialist meeting at the Institute for African Development at Cornell University. Since that meeting which identified and emphasized the importance of hydropolitics on the African continent – a topic which has been greatly neglected within the policy literature and policy process – the South African utilities sector has been developing the plan of damming the Congo with the intention of exporting power to Southern Europe. The power shortages of Europe create a profitable market for African enterprise but they may very well do so at the consequence of depriving Africa of the electrical power which could furnish its development. The time is clearly ripe to reflect on the hydropolitics of Africa within the greater policy debate of African development.

Hydropolitics is an area of African institutional structure which requires clearer and more forward thinking policy attention. And it requires that attention now. This volume does not deal explicitly with issues of solar power but the plan of the South African utilities sector to use the hydroelectric potential of the Congo to meet European electrical power needs raises the important issue of the prioritizing of Africa's energy needs upon the African continent and having policies of solar energy development could play a part in compensating for any such diversion of Africa's energy resources to Europe. Locally controlled solar power possesses less risk of diversion than do large hydro-electric schemes.

But water is more than a source of electrical power and the essays in this book investigate a range of interactions between riparian arrangements and the life of Africa. The essays in this volume focus on the complexities and opportunities offered by the riparian (i.e. river and water) systems of Africa. The volume draws attention to past institutional resolutions and their relationship to their contemporary political power structures, it sketches the ground for potential future conflicts and examines the deficiencies and problems of present water administration regimes. It moves beyond institutional structures to examine issues of health and disease linked to Africa's water systems and considers issues of social equity in relationship to the access to water. It is but a beginning but a beginning at a time of significant

institutional and technological change, change which has consequences for the future hydropolitics of Africa.

Marcel Kitissou
Muna Ndulo
Mechthild Nagel
Margaret Grieco
Institute for African Development,
Cornell University
September, 2006

Chapter One

Water in the Context of Africa: Geopolitics and Geo-economics

Marcel Kitissou*

Introduction

In Africa, potential for water-based conflict is real (according to a UN study, 300 such zones of potential conflict exist around the world). With 70 international rivers, danger spots are the Okavango (between Botswana and Namibia), the Zambezi (between Zambia and Zimbabwe), the Niger River (between Guinea, Mali, Niger and Nigeria) and the Nile Basin, with 10 riparian states. Ten international river basins (Congo, Limpopo, Niger, Nile, Ogooue, Okavango, Orange, Senegal, Volta and Zambezi) are shared by four or more African countries. The Nile is shared by 10 riparian states: Burundi, Egypt, Eritrea, Ethiopia, Kenya, Rwanda, Sudan, Tanzania, Uganda and the Democratic Republic of the Congo. Also, in Africa every country has at least one international river; 41 countries have two or more and 15 have five or more. Guinea, in particular, has 14 international rivers; Ivory Coast and Mozambique both have nine. This situation presents both the risk of conflict and an opportunity for regional cooperation.

Africa is particularly vulnerable to geopolitical implications of hydrological variations. Borders are the colonial legacies of Belgium, Britain, France, Germany, Italy, Portugal and Spain. Consequently, every African country has at least one shared river. Few of these rivers are effectively jointly managed. There are at least 34 rivers shared by two countries; 28 shared by three or more countries. By comparison, Europe has only four international rivers shared by four countries or more but has about 200 water-based separate agreements.

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* Faculty Director, Global Humanitarian Action and International Development, Center for Global Education, George Mason University; and Visiting Fellow, Institute for African Development, Cornell University.

Another way to assess the potential for water-based issues and opportunities for regional cooperation is to take a close look at the number of international rivers within individual countries.

To map potential zones of water-based conflict or opportunities for regional cooperation, one should look at both countries that have a high concentration of international rivers and river basins that are shared by many countries. Altogether, the network of African international rivers ties almost all African nations together. Africa's hydrology alone is a solid basis for an African Union. If anything, this is a way to emphasize that the continent's hydrology can be an instrument for regional cooperation instead of seeing it as source of endemic conflict. Maybe the future of African development resides in going from nation-states to region-states.

However, this sort of regional integration, based on the natural conditions, will not emerge spontaneously. States jealously protect their sovereignty within their current structures. Although in modern history, African countries are generally among the last ones to experience the Westphalia model of state building, more than anybody else, they tend to nationalize nature as they have eagerly "naturalized" the nation-state system.

This aggravates the difficulty of collectively managing resources at the trans-national level. It is already difficult to negotiate the use of one river trans-boundary river basin with the inherent seasonal variations of the water resource. It is even more difficult to conduct a multiplicity of such negotiation when a country shares and/or is traversed by many international rivers.

African countries, following the example of South Africa and Egypt, should develop expertise in a multi-level management of water resources, build a data base for national water resources and negotiate comprehensive water sharing agreements with the "community" of riparian states.

The Issue

Yesterday, 6,000 children died from water-related illnesses.

Today, a child dies every 15 seconds for the same reason.

Above are two sayings that are gaining currency. They are displayed here to create general awareness of the unequal access to water in quantity and quality. The importance of water for life is so fundamental and its uses so numerous and universal. At the same time awareness of the many dangers threatening

water resources is so weak that some, to describe this state of affairs, speak of "water blindness".

Indeed issues are complex. At the global level, Patrick McCully noted:

> Few global issues are of greater urgency than fulfilling global needs for water, sanitation, food, energy and protection from floods. According to the UN, in the year 2000 roughly 826 million people suffered from chronic hunger. More than one billion lacked access to clean drinking water, and some 2.5 billion did not have adequate sanitation. Preventable water-related diseases were killing 10,000 to 20,000 children a day … More than half of all deaths from natural catastrophes (not including droughts) are caused by floods … It is also vital to keep in mind that the reason why the needs of so many go unmet is not because of any shortage of food, water or energy. The problem is largely one of distribution not availability (McCully, 2001: xxxix).

There are many problems caused by the choice of solutions implemented to face the challenges of the management of water resources. For example, this is what is reported about the building of reservoirs:

> Worldwide, reservoirs are estimated to have the combined storage capacity of as much as 10,000 cubic kilometers, equivalent to five times the volume of water in all the rivers of the world. The weight of large reservoirs is so great that they can trigger earthquakes—scores of examples of so-called reservoir-induced seismicity have been recorded. Geophysicists even estimate that the redistribution of the of the earth's crust due to reservoirs may be having a very slight but measurable impact on the speed at which the earth rotates, the tilt of its axis and the shape of its gravitational field (ibid.: 7).

There are many other problems, social and political at regional and local levels as well. The reservoir behind the Akosombo Dam on the Volta River in Ghana flooded 4 per cent of the land in Ghana. According to interviews I had with some people living in Ghana at the time of the project, the dam was the motive behind President Kwame Nkrumah's manoeuvring to keep the former British Togo attached to his newly independent country.

However, it seems that large reservoirs are not the solution in the tropics, particularly in Africa, at the time the world is concerned about greenhouse gas emission.

> Methane, especially in the tropics, is a significant part of the emissions from a reservoir … Using a larger methane multiplier can therefore greatly increase estimates of the total global warming impact of a reservoir … (ibid.: xxxiv).

> The single most important determinant of reservoir emission is climate: emissions from tropical reservoirs are far higher than those from reservoirs in boreal zones (ibid.: xxxvi).

From the issues mentioned above one issue emerges as a common denominator: human behaviour and the collective willingness to preserve the common good, namely voluntary compliance at all levels, individual, local, state and regional. Lack of voluntary compliance in the absence of means to enforce rules can only lead to conflict.

There is a Latin word, *rivus* (stream). From *rivus*, we derived river and rival. Those who share the same resource are potential rivals. They may live in peace in time of abundance. Scarcity may bring conflict over resource sharing. Existing conflict while resources are abundant will get worse when there is scarcity. At the same time, pre-crisis cooperation may be extended in times of scarcity and spill over into other domains as well. The need to build pre-crisis working relationships applies from the lowest to the highest level. And voluntary compliance minimizes the cost of policing communities.

Voluntary Compliance

Because of its versatility and the multiplicity of its uses, water is the most challenging aspect of resource sharing and community building whether it is abundant or scarce, whether it is managed at the community level or the transnational level. And as with nature in general, our relationship with that element of our environment is diverse and complex. I was struck by a story I was told by a colleague about a community in Latin America. A village had problems with access to clean drinking water. People of good will managed to have public fountains built. To their surprise, people continued their old way of fetching water at the river instead of using the public fountain. The reason for this behaviour is not necessarily the lack of their involvement in the initial decision making. The river was the place people kept in touch, socialized and shared the latest news. If investment in the facility persists, it will take some time for the new public fountain to fulfill the role of a market of ideas and the chore of community building that the old riverside location previously provided.

I was living in Aflao, Ghana, in 1992–93, in political asylum following the struggle for democratic reforms and subsequent repression in Togo. In those circumstances, one is usually short of money. And traditional medicinal plants are highly valued because they are more affordable in terms of money and more accessible in terms of time than western-style medical treatment.

Malaria, which is not foreign to water issues, is very common in tropical areas and prevalent in West Africa.

As I suffered from the recurrence of the disease, one day I asked a local friend to show me a plant people in the village use to cure that type of fever since, obviously, people don't rush to hospital in mass every day to get treatment for the malaria. My friend took me to a place in the bush. He pointed out a plant and told me its name in the local language. I bent, grabbed the plant by the middle, and began to pull it out of the ground forcefully. He jumped and shouted, "You don't do it that way! Don't pull it out with the roots. When you do that, you destroy the plant. It will not grow back again and will not be there the next time you come. Just cut the leaves or some branches so that it can grow back! Let me show you how you do it". Before he proceeded, he first talked to the plant, calling it by its name, and saying as in a form of prayer: "We are not here to destroy you. On the contrary, we are here to ask for your help and permission to use your virtue. My friend is ill. We need a few leaves from you to cure him". Then, he took some branches, just the amount needed, from the bush. I am purposefully using here the term "bush" instead of "plant". One single plant couldn't provide the amount of leaves I needed, otherwise it might be might destroyed beyond the point of recovery. So, my friend took a few leaves from several plants. I found this a slow pattern of life, having just come back from the United States a few months earlier. My patience was a sign of respect for the local culture.

A few days later, I asked him: "Do you do farming?" He said "No! It's hard for somebody who knows the virtue of plants to do farming. There may be plants for which you have been looking for months. When you finally find them, it is hard to destroy them in order to grow crops". I did not challenge his wisdom. I just thought: "One needs both medicine and food. If they turn out to be mutually exclusive, how does one balance the two needs at that particular location? And how does one manage the relationship between the medicine-man and the farmer? How does a third party relate to the two entities simultaneously?

This is an example of voluntary compliance with certain rules governing certain communities, in this instance the communities of traditional healers in the village. Without it, it would be hard for members to perform in their domain of activities. Rules enforcement would be extremely costly if not impossible in the community without this kind to free adherence to the unwritten code of conduct. It creates a sense of *esprit de corps*. This sense of *esprit de corps* has its advantages and disadvantages. Internally, deviant behaviour may be perceived as betrayal and not as adaptation to new circumstances. Externally, it might not accommodate others' interests. If too rigid, the code of conduct

may lead clashes with others that display different connections with the land. Besides farmers, what about road builders, factories, urban expansion, etc.? Many interests have to be balanced.

This kind of spiritual bond with the land is called by some scholars a phenomenon of psycho-physical structure of the environment. That may also lead to ethno-ecology: we don't see nature as it is but as we believe it should be. It takes time, generations, and permanent presence to develop this kind of bond with the environment. Healers have their ecological ethics. Farmers have their own. The same is true for fishermen, cattle herders and nomadic people. Road builders, dams engineers, factory managers, businesses people and modern administrations have their own hierarchy of priorities vis-à-vis the surrounding environment. New migrants come with different attitudes and their concerns may be primarily to make a living or do good business rather than to develop a special bond with the environment. Greed may lead traditional authorities to alter local life style and accommodate new entrepreneurships. And what is "local" ends up affecting a whole region and vice versa. A typical example is how trans-boundary water resources are dealt with and how what happens upstream affects downstream populations.

I want to describe another instance to illustrate the clash of cultures related to the phenomenon of psycho-physical structure of the environment as encountered when living , in 1992–93, in the village of Aflao, a Ghanaian village on the border with Togo. The geographical characteristics of Aflao are that it is adjacent to Lomé, the capital city of Togo, on the coast. Aflao and Lomé are the continuation of one another. They look like twin cities separated by an international border. However, being in Ghana, Aflao is "anglophone". And being in Togo, Lomé is "francophone". In addition, as far as urbanization is concerned, Aflao is a small rural town while Lomé had more than half a million inhabitants.

Agriculture and fishery were serious matters in Aflao, which go together with a certain set of beliefs and specific attitude to the environment, the land and the sea especially.

A major problem the local population had to deal with was not only the flow of refugees but especially the behaviour of urban teenagers from Lomé: boys and girls holding hands on streets and kissing on beaches. For villagers in general, public display of affection between boys and girls on streets was a shocking spectacle and for farmers and fishers kissing on beaches was absolutely sacrilegious. The sea that provides fish and the land that provides crops are treated like divinities. To have sexual contact on beaches and directly on land is an offense to Mother Nature. This lack of respect for mother-nature may result, as a matter of collective punishment, in less productivity in farming

as well as in fishery. Antagonism and xenophobia towards the urban youth from Togo began to develop. The emerging xenophobia was not based on ethnic difference, language or religious belief but on attitudes to the natural environment.[1]

The Challenge

Returning to the story about malaria, the plant my friend gave me for free (not counting the value of his time) he could have made me pay for it. If demands for the item were high, leading to perceived scarcity, the social value of the plant would have decreased and its market value increased. I fear that there might come a day when there will, indeed, be some challenge to giving and receiving a calabash of water when visiting family and friends in rural areas. In my tradition, one is welcomed with a calabash of water. And it is a sign of friendship to accept it and drink it. Will that tradition hold? How much will it cost to a poor a villager to offer a calabash of water to a visitor? And for the receiver of the favour will it be appropriate to question the cleanliness of the water? It might be just wise to skip the water ritual and replace it by hands shakes. But the meaning will be lost.

In today's world, as for other natural resources, increasing demands on natural resources, particularly water, are decreasing their social value and increasing their market value, as a commodity. However water is not like any other market commodity. It is central to human life. A Turkish businessman is quoted as having said "Millions of people have lived without love. No one has ever lived without water".

Resource scarcity—water scarcity in particular—may result from three situations, as Norottam Gann (2001) noted:

- demand induced scarcity: growing population over limited resource, or growing use by existing population, or a combination of both particularly in the case of water (agriculture, pollution);
- supply induced scarcity: the resource base shrinks, in quantity and quality (population growth; higher expectation of individual people, new technology, technical environment);
- social structure induced scarcity: unequal distribution of resources (rich areas vs. poor areas, centre and periphery).[2]

In all the three instances, potential for conflict exists within communities, between communities, between communities and businesses, and within regions. In this regard, transnational water resources deserve special attention.

Water is a limited supply on earth. In spite of its unequal distribution the total volume of water is constant: approximately 1,386 million km^3. Nearly 95.7 per cent s salt water (oceans, seas, saltwater lakes and salty aquifers); 2.5 per cent is fresh water. More than two thirds is unavailable for human use (glaciers, snow, ice and permafrost). Only a small portion of the available water (less than 1 per cent is on the surface of the earth, i.e., in lakes, rivers, wetlands, soil, air humidity and in plants and animals.

Of the 1.4 billion people who have difficulties accessing drinkable water, 450 million are in Africa. In Europe each person consumes in average 300 litres per day. An American, on average, consumes 600 litres of water per day. In water-scarce and water-stressed sub-Saharan Africa, the consumption is between 10 and 20 litres per day. When people, in North America for example, flush their toilet for the second time in a day, they have already consumed more water than many people use in the developing world for basic life necessities. To understand what this means, according to the World Bank, the minimum amount of water one human needs to remain alive and healthy is 100 to 200 litres per day. Altogether, Africa accounts for 4.7 per cent of world's water consumption while North America, by comparison, consumes 19 per cent and Europe 9.2 per cent.

Inequality affects both consumption and distribution of water. With 22 per cent of the world's population, China accounts for 7 per cent of its renewable fresh water; Canada, with 0.5 per cent of the world's population, accounts for 9 per cent of the world's renewable fresh water. Just 10 countries hold more than half the fresh water available on the planet (Brooks, 2002). Meanwhile, global population growth is heavily concentrated in those areas of the world (North Africa, the Middle East, and South Asia) where the supply of water is already proving inadequate for many human needs. Between 1850 and 1990, the world population doubled while water use grew 300 pecent. During the past 50 years alone the world population grew by more than 3 billion people: from 2.6 billion in 1950 to over 6 billion in 1999. According to Michael Klare (2002: 144), "If this rate of increase persists, we will soon be using 100 percent of the world's available supply" probably by the middle of the twenty-first century. Within the next 25 years, one third of the world's population will experience severe water scarcity.

The Situation in Africa

In Africa, not only is the population growing but also water resources are diminishing. The flow of the Nile has decreased from 84 km^3 in 1954 to 52 km^3 today. Lake Chad originally used to cover 350,000 km^2. In the 1960s, it was reduced to 25,000 km^2. Today its size is around 2,000 km^2. Since 1950, the African continent lost a significant amount of its available waters. It is projected that another one-eighth will be lost by 2025. While water resources are diminishing, the population is growing and areas of economic development will increase demands on the continent's water supply even more. In that regard, the Nile Basin calls for special attention.

The Case of the Nile Valley

The Nile river basin encompasses 3,350,000 km^2, i.e., 10 per cent of the continent's land mass, inhabited by 40 per cent of Africa's population spread over 10 states (Burundi, Egypt, Eritrea, Ethiopia, Kenya, Rwanda, Sudan, Tanzania, Uganda and the Democratic Republic of the Congo). If the current rate of population growth remains the same, the basin will house 859 million people by the year 2025 from its size of only 245 million in 1990.

Projections for individual countries are far from making one optimistic. For example, the rate of population growth per year is 3.2 percent in Ethiopia, 2.6 percent in Uganda, and 2.2 per cent in Kenya and Sudan (the world average rate is 0.8 per cent). In real numbers, Ethiopia's population will increase from 62 million in 1998 to an estimated 212 million by 2050, an increase of 150 million; that of Uganda from 21 to 66 million, in the same period, and the populations of Kenya and Sudan will each rise from 29 million to 66 million. At this rate, the total population of the Nile Basin including Egypt will grow by an addition of 300 million people between 2000 and 2050.

As observed in the Middle East (typical examples are Israel and Turkey), when they are water-stressed, regional powers behave in a hegemonic manner. That is also the case of Egypt in the Nile Basin. With 98 per cent of the country being desert, the population is concentrated in 2 per cent of the land. Further demographic and economic expansion implies transforming part of the desert into croplands. Therefore, plans upstream to withdraw more water from the Nile are for Egypt a matter of national security. The problem is not only about quantity. It is also about quality as many of the diseases in Africa are water-borne.

Regarding the balance of forces, the status quo in favour of Egypt in the Nile valley has been possible thanks to civil wars, and subsequent instability created by the flow of refugees, as in Ethiopia, Ethiopia/Eritrea, Sudan/Uganda, and the African Great Lakes region (Rwanda, Burundi, the Democratic Republic of the Congo). Once intra-state conflicts dissipate, inter-state conflicts may emerge in an absence of a serious multilateral and integrated management of the Nile river basin system. Development projects in each state (in the post-conflict economic reconstruction efforts) will put more demand on the common water resource and may create either another wave of conflict or reinforce regional cooperation or some combination of both.

The 1999 cooperation initiative in the Nile Basin needs to be encouraged and strengthened. Similar initiatives are taking place in other parts of Africa such as the Niger basin, the Senegal River, the Volta region, the Mono, the Okavango, etc. and can constitute a clear and present basis for regional economic integration.

In the Nile Valley, more often, Egypt has responded by intimidation and also by military preparedness. Three options are available for Egypt:

- letting, if not encouraging, communal conflict in neighbouring countries;
- building an air force capable of bombing dams and other facilities that threaten the source of the Nile;
- invasion (Egypt, it seems, has been training units to fight in the jungle).

However, in the absence of cooperation, anti-Egyptian coalition(s) may also emerge in the region.

However, conflict in the Nile valley, as well as among riparian states of other trans-boundary rivers is not a fatality. In the Nile valley, water sharing is not necessarily cause of hostility and absence of cooperation is, in general, attributable to indifference. Among contenders, only Ethiopia is vocal. But Ethiopia cannot militarily challenge Egypt. Sudan claims the need for more water but usually aligns itself with the position of its Northern neighbour. Uganda's claim does not go as far as to seriously challenge the status quo in the region. The real issue is how to balance acquired rights (Egypt) and fair use (newly independent states) and to create enough incentives for riparian states to be willing to cooperate so that there is voluntary compliance and so exclude processes of costly enforcement, intimidation and hostility.

Also, as Egypt is moving toward a modern economy it may be that agriculture, with its heavy uses of water resource, ceases to be the basis of its economy. That may make, in the future, its current aggressive policy in the

region unnecessary and create better conditions for regional cooperation for water sharing.

Water and the Military

The more immediate concern should be the use of water for military related purposes. This malpractice is old and practically universal. In the Tigris-Euphrates valley, irrigation was practiced more than 6,000 years ago. And as Sumerian legend has it, Deity Ea, to punish humanity for its sins, sent a storm for six days. Leonardo de Vinci and Machiavelli learned the lesson. In 1503, they had plans to divert the river Arno away from Pisa to punish Pisa for waging a war against Florence.

During WWII both Germans and Allies bombed dams, flooded marshes and created lakes. Since the 1950s, Israel, Jordan and Syria have battled for control of water resources. The "Six-Day War" in 1967 was, in part, Israel's response to Jordan's proposal to divert the Jordan River for its own use. The land seized by Israel in the war gave it access not only to headwaters of the Jordan, but to the control of aquifers beneath the West Bank, thereby increasing Israel's water resources by 50 per cent (Clark and King, 2004: 79). Water remains a major issue in the Israeli-Palestinian negotiations. Most of the violent conflicts had been between Israel and its neighbours. To ease the situation, Israel has attempted to import water from abroad.

More recently, in the first days of the year 2004, a deal was being negotiated between Israel and Turkey: "water for tanks". Israel would export tanks and air force technology to Turkey and import water in exchange to be delivered by tankers: 50 million m^3 of water per year (3 per cent of Israel's current needs) and for 20 years form the river Manavgat in Anatolia (Turkey is already delivering water to Cyprus and is planning to do the same with Malta, Crete and Jordan). Similar attempts were made by Israel in Africa. Water exports may become a source of regional power and influence.

During the 1990–91 Gulf War, Iraq destroyed much of Kuwait desalination capacity during its retreat. Before that event, it poisoned and diverted the waters of the Marsh in southern Iraq. In the 1998–2000 Kosovo conflict, dams and hydroelectricity facilities were bombed and wells poisoned with dead bodies (ibid.: 75–82).

According to some Egyptian leaders' public pronouncements, including Sadat and Boutros Ghali, the Nile may be a potential *casus belli* in northeast Africa. However, it was certainly an element in the peace dealing between Egypt and Israel: a) Anwar Sadat made a promise in December 1979 to transfer by

canal to the Negev desert about 365 million cubic meters of the Nile water per year to Israel; b) a similar project, as far back as 1974, was conceived of by an Israeli water expert, Elish Kally, to satisfy Israel's water needs; and c) later on, in a December 1993 speech, the governor of north Sinai, General Mounier Shash, suggested plans to extend the El-Salam Canal past El-Arish to Rafah in Gaza Strip, thus escalating rumors about providing Nile water to Israel and Palestine (Tafesse, 2001: 55). Should these rumours materialize, tensions are likely to diminish in Palestine and more likely to increase in the Nile valley.

In terms of use of water as an instrument of war, sub-Saharan Africa is catching up.

- 1988: Angola-Namibia: Cuban and Angolan forces attacked the Calueque Dam in Angola, threatening water supply in Northern Namibia; the pipeline to Owamboland was destroyed.
- 1990: South African Government cut the water to Wesselton Township.
- 1998: Democratic Republic of the Congo: the Inga Dam was attacked by rebels.
- 1999: Zambia: terrorist bomb cuts the supply to Lusaka.
- In many conflicts water was poisoned by throwing bodies in wells and rivers in attempts to destroy and displace communities. One still remember bodies carried by rivers during the 1994 Rwandan genocide.

The Need for Cooperation

There are at least 260 rivers crossing 145 international boundaries. At least 40 per cent of the world population lives in a river basin shared by two or more countries and at least one fifth of the world population is under potential threat from upstream neighbours.

In general, formal cooperation agreements are more advanced in the wet North than in the dry South. For example, as mentioned earlier, Europe has only four river basins shared by four countries or more but has nearly 200 separate water-related agreements. Africa has a long way to go in this domain.

The Nile is shared by 10 countries, the Volta by six, the Niger by 11, Lake Chad by eight and the Congo and the Zambezi each by nine. Ten of the 70 international river basins (Congo, Limpopo, Niger, Nile, Ogooue, Okavango, Orange, Senegal, Volta and Zambezi) are shared by four or more African countries.

At the same time, one should keep in mind that every country has at least one international river; 41 countries have two or more and 15 have five or more. Guinea, in particular, has 14 international rivers; Ivory Coast has nine and Mozambique also has nine.

Africa has particular vulnerability vis-à-vis geopolitical implications of hydrological variations. Borders were drawn by former colonial powers. Within their current borders, every African country has at least one shared river. There are at least 34 rivers shared by two countries; 28 shared by three or more countries. Few of these rivers are managed jointly.

In southern Africa, powerful states such as South Africa, Botswana, Namibia and Zimbabwe are water-challenged (hence potentially limited in their pursuit of continuing economic growth) and the weaker neighbours have more than they need at this stage of their development. Hegemonic behaviours are to be expected as in the case of Egypt, Israel and Turkey.

The potential for water-based conflict is real but not inevitable (300 such zones of potential conflict exist around the world according to a UN study). Danger spots are the Okavango (between Botswana and Namibia), the Zambezi (between Zambia and Zimbabwe), and the Niger River (between Guinea, Mali, Niger and Nigeria) and, as noted, the Nile Basin (10 riparian states: Burundi, Egypt, Eritrea, Ethiopia, Kenya, Rwanda, Sudan, Tanzania, Uganda and the Democratic Republic of the Congo).

Another way to assess the potential for water-based conflict—and regional cooperation—is to take a close look at the number of international rivers within individual countries. To map potential zones of water-based conflict as well as opportunities for regional cooperation, one should look at both countries that have a high concentration of international rivers and river basins that are shared by many countries. Altogether, the network of African international rivers ties almost all African nations together (Sadoff et al., 2003). Africa's hydrology alone is a solid basis for African Union. One is aware of the "institutional gap" that plagues African states, i.e. the inability of their institutions to effectively deliver services for which they are created. The political failure of weak states has its roots first and for most part in their administrative failure. Maybe instead of trying to construct state systems in abstraction, except for enriching a few corrupt leaders at the expense of the "nation", "region-states" are conceivable based on trans-boundary water resources. The stability of the continent is at stake.

Reshaping Cooperation

To achieve union, countries need a new generation of diplomatic personnel in quantity and quality focusing on issues internal to the continent. It is not easy to negotiate the management of one single international river. It is even more challenging when one has more than one such river to negotiate and manage. In the absence of a new style of cooperation, facilitated or not by external organizations such as the World Bank, dominant regional economies (Egypt, Nigeria and South Africa, for example) and regional powers will tend to adopt hegemonic behaviours, increasing by so doing the risk of violent conflict.

Given that the African economy is largely rural, not only are diplomatic personnel needed but also solid administrative structures are in dire need to ensure a sustainable local economy and prevent intra and extra-communal strife. Private sector has its place. But it is too early to reduce the role of the state in the African context given that personalities are not stronger than institutions: it is an issue of governance rather an issue of public vs. private.

The problem with water resource management is not only about quantity (who gets it?) but also about quality (who gets what?). The interests of downstream communities are not the same as those of communities living upstream. The management of water, indeed, is also and above all an issue of good governance, of ethics and diplomacy. It is one of the cases in which emotion can quickly overwhelm rational behaviour and where local crises can quickly spill over whole regions. The best way to deal with such eventuality is to establish a pre-crisis working relationship from communities to regions.

Recommendations

The main characteristic of the modern system of sovereignty is that it has succeeded in naturalizing the "nation" and, by the same token, in nationalizing the "nature". However, this vision of the nation-state is greatly challenged not only by the fluidity of the modern economy but also by the fluidity of water. The management of water resources particularly exemplifies the challenge of governance and exposes many problems of governance in Africa:

- difficulty in controlling a national resource (water) that is fluid, unstable and unpredictable;
- difficulty in decision-making processes that take into account local needs and international political economy;
- Difficulty in managing interlocking levels and competing uses of water.

Except for South Africa, large states are not success stories in Africa. The administrative failure that weakens African states, large and small, also makes them vulnerable to factional violence. In face of the many intractable conflicts, a different approach to resolving conflict and designing a cooperation scheme is in order.

1 The conflict in Sudan may be addressed on the basis of the Nile Basin region, which may include other peace negotiations such as in the Horn, Sudan/Uganda, and the Great Lakes region. More often than not, there are links between them all. One should find ways to make possible for riparian states to perceive some common interest and create incentives for collective answer.
2 There should be training programmes for new personnel for the management of both intra- and inter-state basin systems in an integrated and multilateral manner.
3 This approach can be used both for conflict resolution and economic integration.
4 Two pilot projects could be the start: one in a conflict zone such as the Nile Basin and the other in a relatively peaceful area such as the Volta river region.

Notes

1 On a larger scale and scope, part of the conflict in Darfur today stems from differences in ethno-ecology between nomads and farmers, compounded by environmental degradation (also Masai and Kikuyu in Kenya).
2 Usually in urban expansion, the poor are pushed further and further away from water resources. Areas inhabited by the rich and powerful are poor candidates for dams and reservoir construction which usually displace populations and make the life of locals more difficult.

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Chapter Two

The Nile as a Source of Cooperation or Conflict: The Case of Ethiopia, Egypt, and the Sudan

Debay Tadesse*

Introduction

One of the critical factors behind the dismaying image of misery and conflict in Africa is water shortage, which leads to poor agricultural productivity and consequently famine. The total amount of fresh water on the earth's surface is only 3 per cent and the rest, 97 per cent, is sea water. Out of the 3 per cent fresh water, only 0.3 per cent is found in rivers and lakes while the rest is locked in icecaps and glaciers (Blij and Muller, 1996: 412). Africa, which accounts for over 20 per cent of the total land area of the surface of earth (ibid.: 17), contains most of the 0.3 per cent fresh water in the world. Africa has a reticulation of 54 drainage basins, including rivers, which either 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 utilized, leaving the remaining 98 per cent to replenish the oceans (Okidi, 1994: 1).

The Nile is the longest river (6,825 km, or about 4,240 miles) in the world 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 directly depend on the Nile River for their livelihood and as a source of energy for industrial and domestic needs.

The countries surrounding the Nile River have an estimated population of 300 million which accounts about 40 per cent of the African population

* PhD Candidate, Howard University.

with an average per capita income of $282. It is estimated that by 2025 the number of people who depend on the Nile River will 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, this number will change and it is projected that Ethiopia will have 20 per cent more people than Egypt (Desta, 1992: 12).

In addition to population growth, migration, and overgrazing, 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 for Ethiopia.

Ethiopia has been synonymous with disastrous famine since the 1980s. In the years since, drought and famine have continued to plague the county. The hunger in Ethiopia has become so chronic and widespread that international donors fear that the number of hungry Ethiopians is increasing beyond the world's ability to feed them (Thurow, 2003: sec. 1A). In 2000, about 13 million Ethiopians have been fed with 1.7 million tons of food donated by the US alone. According to USAID/Ethiopia, approximately 11.3 million people were in need of emergency food aid and the total food aid requirement was 1.4 metric tons (MT) (USAID, 2003). Currently, over 15 million people are threatened by famine and 45 per cent of the total population of Ethiopia rely on external food assistance.

Clearly, 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 shared by other countries. One reason for environmental degradation and recurrent drought and famine in Ethiopia is lack of water management. Therefore, an important strategic plan to overcoming the problem of recurrent drought and famine is for the Ethiopian government to concentrate on water development of the Nile River. In this context, it is essential for the government not only to develop water resources but also to protect the 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 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 the World Day for Water, in 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 severe