

Case Study 1



Environment, Sustainable Development and the Nile River Basin

NOTE: Use this case study with Activity 1.1, after working through Module 1.

Introduction

In the past, the availability of Nile water all year round supported some of the ancient world's most advanced civilisations. The range of ecosystems rivals that of any river basin in the world. Today, the Nile River Basin is home to an estimated 160 million people. The overwhelming majority of people living in the Nile Basin live in rural areas and depend directly on land and water resources for shelter, income and energy. However, in recent years the use of the Nile's waters for development has become both a source of conflict and of international co-operation for the 10 countries that share its basin. The population within the Nile River Basin is expected to double in the next 25 years. The already pressing sustainable development challenges are going to require innovative responses from all sectors of society. The recent headline "Armed Forces are put on Standby to tackle threat of Wars over Water" (28 February 2006) in the *Sunday Independent* newspaper is a stark warning of what is to come if people living in the Nile River Basin are not able to meet the social, environmental and economic challenges arising in societies living close to the world's longest river.

History and context



The Nile River flows 6 600 km and drains an area of about 3,1 million km² or one tenth of the African continent. This catchment includes parts of 10 countries – Burundi, Democratic Republic of Congo, Egypt, Eritrea, Ethiopia, Kenya, Rwanda, Sudan, Tanzania and Uganda. Two colonial era treaties (1929 Nile Water Agreement and the 1959 Agreement for the Full Utilisation of the Nile) gave two countries extensive rights over the river's utilisation, namely Egypt and Sudan. In recent years a number of the upstream countries including Kenya, Uganda, Ethiopia and Tanzania have expressed concerns over the long-standing arrangements. They argue that they give Egypt unfair control over the river's waters that are needed to sustain people and ecosystems and provide for agricultural and industrialisation growth initiatives at the same time.

Ecosystems and human well-being

The Nile River Basin contains a wide range of unique and highly productive ecosystems including montane areas, lakes, wetlands and, of course, the river itself. These ecosystems contribute to the production, retention and transport of water from the highland areas with annual rainfall of 2000 mm to Northern Sudan and Egypt with virtually zero annual rainfall.

In addition to supplying water for irrigation, industry, hydropower and household consumption, the Basin's natural systems provide resources for food, medicines, fuel and construction materials. These ecosystems play a number of important hydrological functions including flood mitigation, flow regulation and water quality. They are also of aesthetic, cultural, and heritage significance for a wide variety of communities. These ecosystems obviously also have intrinsic value - a right to exist independent of the service value for human beings.

About 160 million people living in the Nile Basin use the ecosystem services to provide for a range of livelihoods including: rainfed agriculture, livestock production, irrigated agriculture, fisheries and urban dwelling. For some communities the ecosystems provide direct services including water, shelter, medicines, fuel, fish, plants and animal feed worth up to US\$220 per person per year. In some communities as much as 80% of the calorie intake is provided by goods and services directly related to the Nile Basin ecosystems.

Environmental issues and sustainable development challenges

The resources of the Nile Basin are subject to a number of threats that undermine people's livelihoods. Poorer people are most directly affected by deteriorating environmental conditions and issues of



access. Agricultural and grazing lands are being degraded, water quality is declining, wetlands and forests are being lost, over-exploitation of natural resources is continuing, pollution from urban, industrial and agricultural resources is increasing, water-borne diseases are proliferating and the harmful impact of floods and droughts is intensifying.

Land degradation, or the diminishing of biological productivity of a given tract of land, has many causes. These include deforestation, cultivation of unsuitable marginal lands, inappropriate or excessive use of agricultural technologies and chemicals, overgrazing, and poor management of cultivated land, often exacerbated by drought. All of these lead to depletion of soil fertility as well as water and wind erosion. Soil erosion harms productivity by depositing silt in dams, irrigation systems and river transport canals, and by damaging fisheries. The results include increasing deficits in food production, declining food security, and greater human poverty.

Deforestation throughout the Basin has been driven by the demand for wood for household and commercial fuel, for drying fish, curing tobacco, and baking bricks. These pressures have been exacerbated by the influx of refugees. In addition, sugar cane, tea and coffee plantations have replaced large areas of forest while at the same time introducing large quantities of pesticides and fertilisers into fragile ecosystems. Recent rapid population growth has exacerbated the stress on forest and wetland systems. As population density increases the lack of sanitation infrastructure has become increasingly apparent and water borne diseases are on the increase in many places along the Nile.

Wetlands in the Nile Basin are threatened by drainage (for agriculture, industry and settlements), filling (for solid waste disposal, roads and settlements), dredging and stream canalisation (for navigation, flood protection and water extraction), ground water extraction, siltation and discharges of pesticides, herbicides and sewage. In some cases the waste loads have increased to such an extent and the function of the wetlands have been so impaired that their natural capacity as a buffer and filter for sediments and certain pollutants has been exceeded. While pollution management plans have been prepared and implemented by some of the leather tanning, fish processing and sugar factories, breweries and abattoirs along the lakeshore, but these are exceptions.

Water quality within the Basin is also a serious concern. The major threats to water quality include insufficiently treated domestic, urban and industrial waste, non-point pollution from pesticides and fertiliser



residues, siltation and sedimentation, increased salinity and wetland loss. Serious water-borne diseases are becoming more prevalent throughout the Basin and toxic and hazardous mining wastes are a danger in some local areas. The costs of these threats are invariably borne by downstream users, particularly the poor who live in marginal or less desirable areas where their susceptibility to sickness is greater. This also has a negative impact on their work and educational opportunities. The most serious diseases are malaria, diarrhoea and bilharzia. Controlling the threat of water-borne disease will also provide direct benefits to people living with HIV/AIDS throughout the Basin as they are more susceptible to opportunistic infections due to their suppressed immune systems.

Perhaps one of the most contentious issues related to the Nile River is water quantity and the utilisation of available water resources. The 1959 Agreement for the Full Utilisation of the Nile Waters is an agreement between Egypt and Sudan. This agreement allocates 55,5 billion m³ for Egypt and 18,5 billion m³ for Sudan. This amounts to most of the available flow estimated at 84 billion m³ less 10 billion m³ lost through evaporation and other ecological processes. The agreement assumes that the combined needs of the upper Nile countries would not exceed 1-2 thousand million m³ annually and that any claims should be met by a unified Egyptian/Sudanese front. As development pressures build in the other eight riparian countries and the challenges mentioned compromise water quality and availability, this agreement is bound to be challenged. This has great potential for conflict in the region and for further environmental degradation and social exclusion as more funds for ecological and social requirements are diverted into economic development initiatives.

Underlying issues

These environmental threats have often been attributed to rapid human population growth and persistent poverty. However, the links between poverty and the environment are intricate and vary considerably from place to place. Although poverty makes people far more vulnerable to environmental change and natural disasters, the narrow understanding of poverty in terms of \$/day leads to an equally narrow response focusing on economic growth that may actually enhance the vulnerability of poor people. Unless the economic growth is based on more equitable, environmentally sustainable, security and empowerment orientations, it is more likely to be an underlying cause of unsustainable development than an appropriate response.

Seven of the 10 Nile Basin countries are expected to double their populations between 1995 and 2025. This rapid population growth



increases pressure on the natural resource base and often contributes to environmental damage. This is especially relevant in the currently mostly agriculturally-based economies of the Nile Basin. These economies have not been able to adapt to the rapid changes in population and the governments involved have not kept up with the infrastructure requirements of growing populations. This has contributed to increasing rural to urban migration. Rapidly growing and unplanned urban centres often lack the infrastructure and institutional needs to protect human and environmental health.

Looking beyond population and poverty, there is now increasing acceptance that the underlying causes of environmental threats are often related to institutional, governance, awareness and capability issues as well as to sectoral and macro-economic policies.

Inappropriate or non-existent policy is also often cited as the driver of unsustainable practices. For example, policies that promote economic growth without adequate land-use planning and pollution legislation can lead to concentrations of economic activity, congestion, and pollution. Similarly, structural adjustment policies without accompanying social measures can have negative education, health and environmental impacts.

Macro-economic policies linked to exchange rates and trade have affected the Nile Basin by changing the process and quantities of exports. This in turn influences cropping patterns, industrial development and economic growth. The impact of macro-economic policies depends to a large degree on regulatory and governance systems in place to ensure environmental protection. Enforcement of regulations is a weak point in most Basin countries. For example, trade liberalisation and promotion of export crops contributed to steady growth in Ugandan agriculture during the last decade. Most of this growth resulted from area expansion and not from increases in productivity. Thus in the absence of strict forest conservation policies, liberalisation-driven growth can encourage deforestation.

Even where legislation exists, the relatively poor administrative capacity in many of the Nile Basin countries limits understanding, performance and enforcement of this legislation. In an effort to ensure greater local involvement and in line with decentralisation policies, some national governments have delegated responsibility for resource and environmental management to regional and local institutions. However, some are not equipped to assume this task in terms of staff, training, budget or legal authority.



Awareness, education and the role of universities

Lack of awareness and concern for environmental issues as well as the risks and uncertainty involved in sustainable development challenges need to be taken into account. For example, the large-scale programme to establish wells in the Sahel during the 1960s and 1970s can be directly linked to growing herd numbers and land degradation within a 100 km radius of the wells. Conflicting interests are also an important underlying cause of unsustainable practices as is evident in the expansion of large-scale mechanised agricultural schemes in some Nile Basin countries and the subsequent concentration of migratory animals and nomadic populations. Environmental education and ESD initiatives thus need to take into account not only information but also exploratory orientations. These need to involve different interest groups and equip people with the competencies to make decisions in situations of conflict and uncertainty.

Universities are seen as key contributors to the development of the kinds of information, capacity for participation and innovative solutions that are needed in the Nile River Basin. A recent initiative is the formation of the Nile Basin Environmental Education Lecturers Network. This network seeks to enhance the capacity of universities in the countries along the Nile River to share information on environmental education courses and collaboratively to develop courses and learning support materials. This includes the collaborative and shared supervision of masters research initiatives in the region focusing on educational initiatives with an environment and sustainability focus.

Current 'status' of environmental education

The Nile Transboundary Environment Action Project's (NTEAP) EE&A component is mandated to increase capacity within the basin through (i) students and lecturers exchange, and (ii) development of a regional EE course and modules framework for national universities to adopt.

A baseline survey in late 2004 (NTEAP, 2005b) revealed that tertiary institutions of learning offer environmental education courses and/or subjects/units at various levels: certificate, diploma, degree and even masters level. Stand-alone environmental education courses are rare - only Makerere University in Uganda and Ahilia University in Sudan offer an MSc course on environmental education. The trend is to offer environmental education as a topic within environmental science courses.

Table 1 summarises courses, modules or topics and institutions which currently offer EE training in the Nile Basin.



Table 1. EE courses, modules and topics currently offered

Country	EE courses, modules or subjects	Main institutions
Burundi	There are no EE&A courses or modules taught in universities within Burundi. EE is mentioned within certain natural sciences courses.	University of Ngozi, National University of Burundi
Congo DR	No EE stand-alone course, mainly through natural sciences.	University of Kinshasa Institut superieur de developpement rural des grands lacs
Egypt	EE courses offered at various universities.	Environment Institute Cairo University
Ethiopia	Environmental topics infused in some courses.	Addis Ababa – Geography Department, Bahr Dar University, Makele University
Kenya	Kenyatta University has a course at MSc level on EE, School of Environment studies at Moi University offer topics on EE. Teachers training colleges offer a first-year EE module.	Maseno Universty, Moi University and Kenyatta University, teacher training colleges
Rwanda	Universities offer topics on EE through natural science courses. Two MSc courses have been initiated which will increase the topics. Kigali Institute of Education offers a few first-year contact hours while Kigali Health Institute has an EE course.	KIE (Kigali Institute of Education) and KHI (Kigali Health Institute)
Sudan	Teachers training courses by Hope in the Desert Project (1994) Activity manual and teachers guide has been developed. Three levels of university–established faculty of environmental studies, only one course on environment.	Juba, Kordofan, El Fasher, Malakal, Ahlia, Gezira, IES
Tanzania	University of Dar es Salaam, School of Education and School of Geography have topics on EE.	Sokoine University, Dar University
Uganda	MSc on EE and topics within the Geography Department. Kyambogo university offers topics on EE.	Makerere and Kyambogo Universities

There are other tertiary institutions that offer EE as a subject. These are mainly teacher training colleges. In Kenya EE has been included



in the training of primary school teachers since 1986 in science, agriculture, history and civics. At a diploma level, EE has been included in the training of secondary teachers since 1974 and 1985 in sciences and geography (Lindhe *et al*,1992).

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