Economic Commission for Africa

BRIEFING PAPER SERIES

THE ENVIRONMENT AND WATER RESOURCES IN AFRICA

No. 3
April 1999

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UNECA's Executive Secretary's Message to the 2nd International Conference on Wetlands and Development (Dakar, 8-14 November, 1998)

Africa is at a threshold of changes and faces challenges that will have a fundamental impact on the survival and prosperity of its people. These challenges are already manifesting themselves in many ways, the most significant of which is the ability of African states to ensure food security for a growing population on a sustained basis.

The interactions between population growth, food security and the preservation of the environment, known also as the nexus issues, and the manner in which such interactions are managed by Africans will determine success or failure in meeting the challenge of feeding a population which under the most conservative projections is likely to grow at between 2.5 to 2.7 percent per annum till 2020.

Environmental limits have been reached in numerous areas. Drought which was a twice-a-century phenomenon in the not too distant past, occurs now, on average, twice a decade in the northern and southern regions of Africa. The environment, not war, is becoming the largest source of refugees as thin soils are mined, water supplies used up and desertification and deforestation accelerate all over the continent. This mostly occurs in the endeavour to satisfy the basic needs of growing populations.

Water, it's availability and management, forms one of the major crosscutting constraints in reversing the current negative synergies in Africa between the nexus issues. Currently, at least nine countries in Africa face water shortages and another ten are threatened with such shortages. There is, in addition, the potential for major destabilizing actions if effective water- sharing agreements are not reached in many of Africa's 57 shared river/lake basins. The gradual eco-human disaster, which is ongoing in the Lake Chad basin, is an indicator of a future where large populations (11 million in this case) stand to lose their traditional means of livelihood.

The ECA recognizes water and it's prudent management as a key to reversing the downward spiral in human welfare resulting from a combination of rapid population growth, stagnating per capita food production and accelerating environmental degradation across the African continent. The ECA has specifically created the Food Security and Sustainable Development Division to address these issues.

We intend to work with our member states and partners in:

- developing policies and programs for the better and more efficient management of our

water resources for increased agricultural production and for domestic and industrial use.

- harnessing the ecosystem services of water resources for present and future generations.

- increasing the scope for inter-state water sharing through the development of mechanisms for equitable and cooperative water assessment, development and utilization.

I am, therefore, gratified by the fact that we can work with Wetlands International, International Union for the Conservation of Nature and the World Wildlife Fund at this Second Conference on Wetlands and Development in shaping a more cooperative relationship between advocates of wetlands conservation and those of integrated water resources management.

I eagerly await the outcome of this Conference which will yield practical solutions to facilitate Africa's development by adequately addressing the issues of water resources utilization and management in the nexus context.

Water Resources Development and Management in Africa- Current Trends and Strategies for the Future.

Water is one of the most limiting constraints to African Development. Water Resources and their sustained use are essentials for human life. Historically, a reliable water source both in quantity and quality has been a prime pre-requisite for the development of all forms of human civilization and socio-economic activities.

The Economic Commission for Africa, as the regional arm of the United Nations Secretariat, recognizes the crosscutting nature of the constraining role of the lack of potable water and water for all forms of production.

Africa is characterized by extremes of potential water availability ranging from large areas of severe aridity (Sahara/Sahel and Kalahari in the North and South and the droughty semi-arid areas of Southern Africa) to potentially excess water availability region that straddles the Equator (Tropical and Sub-tropical zones).

In Africa, only a small fraction of the potential water resources (surface and ground) have been developed. Tables 1 and 2 show respectively estimates of water resources availability and withdrawals (use) for the continent.

At the current rate of development, water scarcity for a rapidly increasing population can be forecasted for many countries on the continent. It is projected that by the year 2025, nine African countries (Algeria, Burundi, Egypt, Ethiopia, Libya, Morocco, Kenya, Rwanda, and South Africa) will experience water scarcity and another nine countries will experience significant water stress. These include Burkina Faso, Ghana, Madagascar, Mozambique, Nigeria, Tanzania, Togo, Uganda, and Zimbabwe. Water scarcity occurs when the annual internal renewable water resources per capita is less than 1000 cubic metres and water stress occurs when this per capita indicator is more than 1000 but less than 1667 cubic metres. This annual internal renewable water resources indicator refers to average annual flow from rivers and groundwater generated from endogenous precipitation.

Table 1 Regional Distribution of Water Resources in Africa.

Sub-Region **	Area	Rainfall	Internal renewable resources *			
	($1000km^2$)	(Km^3/yr)	(Km^3/yr)	(mm/yr.)	% of total	% of precipitation
Northern	5753	411	50	8.7	1.2	12.2
Sudano-Sahelian	8591	2878	170	19.8	4.3	5.9
Gulf of Guinea	2106	2965	952	452.0	23.8	32.1
Central	5329	7621	1946	365.2	48.8	25.5

Eastern	2916	2364	259	88.8	6.5	11.0
Islands (IS)	591	1005	340	575.3	8.5	33.8
Southern	4739	2967	274	57.8	6.9	9.2
Total	30025	20211	3991	132.9	100.0	19.7

Source: FAO, 1995.

* Internal Renewable Resources: (cubic kilometres/year) Average Annual flow of rivers and groundwater generated from endogenous precipitation.

** The Regions are:

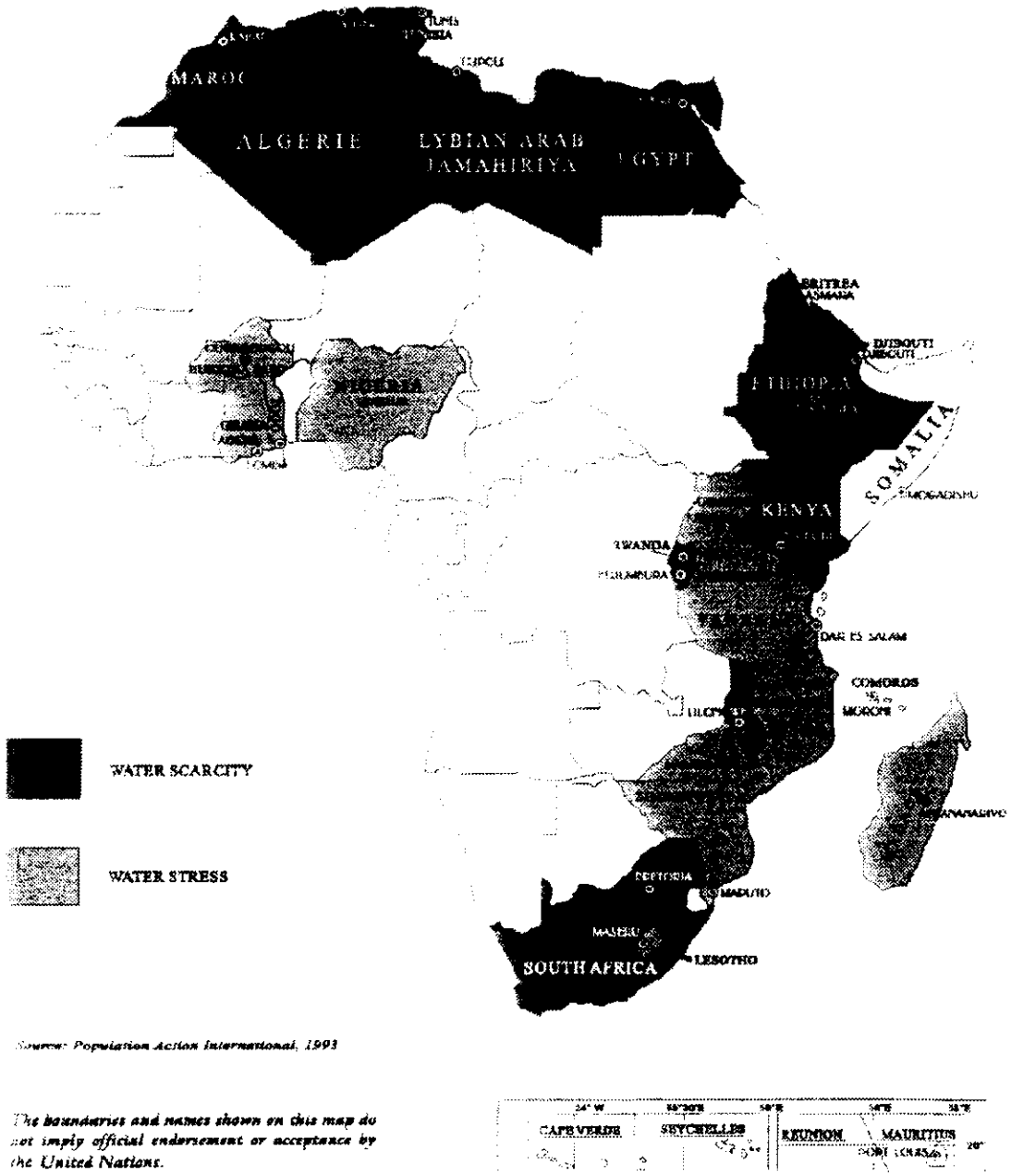
Northern: Algeria, Egypt, Libya, Morocco, and Tunisia.
Sudano-Sahelian: Burkina Faso, Cape Verde, Chad, Djibouti, Eritrea, Mali, Mauritania, Niger, Senegal, Somalia, Sudan.
Gulf of Guinea: Benin, Cote d'Ivoire, Ghana, Guinea, Guinea Bissau, Liberia, Nigeria, Sierra Leone, Togo.
Central: Angola, Cameroon, C.A.R., Congo, Equi. Guinea, Gabon, Sao Tome, Dem. Rep. of Congo.
Eastern: Burundi, Ethiopia, Kenya, Rwanda, Tanzania, Uganda.
Ind. Ocean Islands: Comoros, Madagascar, Mauritius, Seychelles.
Southern: Botswana, Lesotho, Malawi, Namibia, S. Africa, Swaziland, Zambia, Zimbabwe.

Table 2 Regional Distribution of Water Withdrawals in Africa.

Sub-Region	Withdrawals by Sector					
	Agriculture $x10^9 m^3/yr$	Community $x10^9 m^3/yr$	Industries $x10^9 m^3/yr$	Total $x10^9 m^3/yr$	As % of total	As % of internal resources
Northern	65000 (85%)	5500 (7%)	5800 (8%)	76300 (100%)	50.9	152.6
Sudano-Sahelian	22600 (94%)	1200 (5%)	300 (1%)	24,100 (100%)	16.1	14.2
Gulf of Guinea	3800 (62%)	1600 (26%)	700 (12%)	6100 (100%)	4.1	0.6
Central	600 (43%)	600 (43%)	200 (14%)	1400 (100%)	0.9	0.1
Eastern	5400 (83%)	900 (14%)	200 (3%)	6500 (100%)	4.3	2.5
Islands (I.D)	16400 (99%)	200 (1%)	20 (-)	16620 (100%)	11.1	4.9
Southern	14100 (75%)	3000 (16%)	1800 (9%)	18900 (100%)	12.6	6.9
Total	127900 (85%)	13000 (9%)	9020 (6%)	149920 (100%)	100.0	3.8

Source: FAO, 1995

WATER STRESS OR WATER SCARCITY BY 2025



Source: Population Action International, 1993

The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

A key statistic worth noting (Table 2) is that the percentage of the internal renewable water resources generated from endogenous precipitation which is withdrawn for the three major uses on a continental scale is only 3.8 percent

Increasing competition for fresh water resources has cast the spotlight on various aspects of water development and management in Africa. This competition is a result of increasing demands for water supplies from rapidly growing population and other sectoral pressures arising from consumptive

and non-consumptive uses. These include in particular, agriculture (irrigation and drainage), the provision of domestic water supplies and sanitation, a growing industrial sector, energy production, ecosystem maintenance, rural/urban shifts and unaccounted for losses in many old water distribution systems.

The question then arises as to what concrete measures are needed in the African context to meet the predictable challenges of water scarcity and stresses of the future.

The concrete measures we recommend include Integrated Water Resources Development and Management, improvements in Water Resources Assessment, Water Quality and Aquatic ecosystem preservation, and increased Urban and Rural Water Coverages.

The first and foremost need in Africa today is the development and implementation of Integrated Water Resources Management Policies and Strategies. These must recognize both the economic value of water as a natural resource, and the environmentally sustainable management of the resource to ensure the protection of freshwater ecosystems, water quality and human health.

Such an integrated approach, when set within national economic frameworks, is essential for achieving efficient and equitable allocation of water resources and thus for promoting sustainable development on the continent.

The key principles of the integrated approach should be sustainability, clear and executable water policies and the management of demand based on equity and efficiency. Fundamental to this process are the designation of river basins and aquifer units as basic management units in the planning, allocation, development and management of the water resource base.

Future Strategies for achieving integrated water resources management (IWRM) should include the following elements:

1. The strengthening of institutional and human capacities at both national and local levels for water resources analysis particularly the capacity to assess the quantity and quality of the resource base. The need for strengthening local capacity is especially strong in the African context and the training of local entrepreneurs has an important role in implementing such strategies. There is also the need to promote the use of indigenous technologies and knowledge, in addition to the transfer of appropriate technologies.

2. A second component of such a strategy is to establish and maintain effective data collection and dissemination through research and effective information management systems to support sound policy formulation, timely management decision-making and operations of the water resources. To this end Governments need to adopt, implement and monitor water-related indicators of progress in achieving management objectives including those of water quality.

3. Integrated water resource development in Africa should recognize the important role ecosystems play as users, water regulators and providers of freshwater-based resources (including fisheries) and therefore should encompass the promotion of an ecosystem approach to the management of both surface and groundwater. Such an approach will bring about productive and sustainable interactions between human activities and the ecological functioning of freshwater systems thus minimizing downstream impacts on estuarine and marine environments. It will also help reduce economic and social losses from droughts and floods.

4. Participation by beneficiary communities, especially women, in the planning and implementation of water development at the local level is an absolute essential for the successful implementation of IWRM. This prerequisite should be embedded in national legislative and regulatory frameworks as well as their implementation.

5. Another requirement for success is the need to design and adapt institutions to effect an integrated approach to policy analysis and management for specific socio-economic and environmental settings. The role of national governments should be clearly defined and the distinction between standard and regulation setting and control on the one hand, and direct management and provision of services on the other should be made. Where appropriate the private sector and other stakeholders should be encouraged to participate in the latter role.

6. Africa has more than 50 shared river/lake basins and many aquifer coincide with more than one national boundary. This includes the major rivers of the continent such as the Nile, Zambezi, Congo, Niger, and others. This means that any meaningful strategy for the sustainable development of Water Resources requires International Cooperation. This can be in the form of concluding new or building on old agreement principles, arrangements, instruments and programs of action taking into account the interests of the riparian states concerned.

Another aspect of international cooperation of relevance to Africa is the need for mobilizing and providing new and additional financial resources as set out in Agenda 21, to facilitate capacity building, transfer

of technology, research and information exchange.

It is the intention of the UN Economic Commission for Africa to play an active role in harmonizing, at regional and national levels, the recommendations being made to our member states for integrated water resources management strategies and their implementation.

Other UN Agencies notably UNDP, UNEP, WMO and the World Bank under the umbrella of the Secretary General's Special Initiative for Africa, (UNSIA), will be putting special attention on Water Resources Development on our continent. The ECA as co-chair of the UNSIA will play an active role in the implementation of this initiative.

It is our earnest desire that the management of water resources in the next century will result in clean water for every African, with improved sanitation and food security through irrigation-based agriculture.

LAND DEGRADATION

Land is the most valued resource and the basis for survival for most people in Africa, with agriculture being the main economic activity for most countries. The land resource base in most regions of the continent is facing serious degradation with detrimental impact on agricultural production and food security. Land degradation has been identified as a major problem in Africa. It is exacerbating the existing natural constraints on agricultural production, including poor soil quality, variable climatic conditions and reliance on rainfed agriculture.

The main causes of soil degradation are: overgrazing, particularly in drylands; extensive clearing of vegetation for agriculture; deforestation; extensive cultivation of marginal lands; the use of inappropriate agricultural technology; land shortages, usually due to unequal distribution; modernization of agriculture that has led to marginalization of subsistence farming; and drought. All these conditions and activities lead to depletion of soil fertility, water and wind erosion, and salinization. The magnitude of soil degradation is illustrated in the following tables.

The main causes of soil degradation by region in Africa are (million ha):

Cause	Region North	Sahel	Southern	Others--	Total
Overgrazing	27.7	118.8	44.0	3.9	194.4
Agricultural activity	8.6	34.8	12.8	4.2	60.4
Overexploitation	0.2	54.2	1.1	0.0	55.5
Deforestation	4.3	16.3	0.7	0.7	22.0
Total	40.8	224.1	58.6	8.8	332.3

Source: UNEP: World Atlas of Desertification, second edition, 1997.

Serious degradation problems

The most serious degradation problems are identified by the FAO in the following table. By region, they are:

Region	Arable Land	Grazing Land	Forest Land
Mediterranean and North Africa	- Declining soil fertility - Wind and water erosion - Salinization on irrigated lands	- General degradation of vegetation - Wind and water erosion	- Degradation of vegetation - Water erosion on degraded forest lands
Sudano-Sahelian Africa	- Decline in nutrient levels in the soils - Decline in soil physical properties - Wind and water erosion	- General degradation of vegetation - Wind erosion in sub-humid areas	- Degradation of vegetation
Humid and sub-humid West Africa	- Decline in nutrient levels in the soils - Decline in soil physical properties - Water erosion	- Degradation of vegetation - Wind erosion in sub-humid areas	- Degradation of vegetation
Humid Central Africa	- Degraded soil physical properties - Degraded soil chemical properties	-	-
Sub-humid and mountain East Africa	- Water erosion - Degradation of soil physical properties - Degradation of soil chemical properties	- Degradation of vegetation - Water erosion	- Degradation of vegetation - Water erosion
Sub-humid and semi-arid Southern Africa	- Water erosion - Degradation of soil physical properties - Degradation of soil chemical properties	- Degradation of vegetation - Wind and water erosion	- Degradation of vegetation - Erosion

Source: FAO: African Agriculture: the next 25 years, 1986.

Success stories

There are several success stories in land management, especially where local communities have been involved.

The highlands of East Africa provide excellent examples of both anthropogenic degradation of land and its recovery. These highlands, stretching across Tanzania, Uganda, Kenya and Ethiopia, have a high agricultural potential, and have supported large numbers of people throughout historical times. At present, rising population, a history of land mismanagement, and land scarcity have led to extensive land degradation, resulting in both erosion and loss of soil fertility. On the other hand, recognition of the seriousness of the problem has led to concerted attempts to arrest land degradation, often with low-cost technologies and at times with considerable success.

One of the success stories comes from the Machakos District in southeast Kenya where land degradation, which started in the 1930s has been arrested due to a long-term political, technical, social and economic commitment to water and soil conservation. Similarly, the long-continuing and extensive soil erosion problem of the Dodoma area in Tanzania has been resolved by the HADO Soil Conservation Project. Previously, this area was losing 1 cm of soil annually by erosion, which translates into 13 500-t/sq. km annually, and regional water reservoirs had a life expectancy of not more than 45 years. The project recognized the interdependence of agriculture, forestry and livestock; the importance of popular participation in soil and water conservation; and the importance of the introduction of conservation practices and training of farmers. Perhaps, the most dramatic event of the project was the government's effort at closing the intensely degraded areas to cattle in 1979 and relocation of about 85 000 heads of livestock on the neighbouring plains.

Such long-term commitments from both government and community are required across Africa.

SAFER AFRICAN CITIES: WHAT MUST BE DONE

(Message of the Executive Secretary for the World Habitat Day, 5 October 1998)

Urbanization in Africa is spreading at a rapid pace. Compared to other regions, Africa, with approximately thirty-three per cent of its population living in urban areas, is the least urbanized continent in the world. However, with an urbanization rate of about five per cent per annum (1980-93), the continent recorded the fastest urban growth rate. Given this trend, an estimated fifty-two per cent of the continent's population will be living in urban hubs by the year 2020.

In addition to the share of the urban population, the number of urban centers in Africa is also increasing. Urban centers with a population of two million increased from two in 1970, to eight in 1990, and is expected to reach thirty-one by the year 2010. By the year 2000, less than three years from today, there will be eighty-nine cities in Africa with more than half a million inhabitants and fifty-four cities with over a million inhabitants. The current urbanization trends coupled with the limited capacity of urban centers to provide adequate shelter, basic health and sanitation services will poses one of the major environmental and developmental challenges facing the continent.

The theme of this year's Habitat Day, Safer Cities, gives us an opportunity

to focus on two major urban problems facing Africa: unhealthy environment leading to high mortality and increased poverty leading to increased crime. According to current estimates, forty to sixty per cent of the African urban population live in slums and shantytowns where poverty, overcrowding, crime, unemployment, prostitution, pollution and homelessness are on the rise. Indeed, the African urban scene has become a sea of social discontent and disorder making most cities in the continent increasingly unsafe and unattractive.

Health is increasingly becoming a crucial aspect of the urban challenge in the continent. Diseases such as Tuberculosis and Malaria are now major causes of death in urban Africa. The spread of HIV/AIDS, fueled extensive by population movements, is affecting an alarming proportion of urban populations. In planning for Safer Cities for our children in the 21st century these vital health issues must be placed high on the agenda of African policymakers.

Although a discernible proportion of the urban population are migrants from rural areas, Africa's cities are increasingly devoid of the traditional social values and community spirit, characteristic of rural Africa. Instead, social disorder, juvenile delinquency and violence are on the rise. While, cities in of themselves do not generate violence, the spiral web of urban poverty, political and social exclusion, and economic deprivation often manifests itself in social tension and unrest that cannot easily be handled.

A recent report of the United Nations International Crime and Justice Research Institute (UNICRI), On Criminal Victimization of the Developing World, 1995, reveals that cities in Africa have the highest rates of violent crime. The study compared, over a five year period, the percentage of the population in different regions who are victims of crimes in cities with more than 100 000 inhabitants. This percentage stood at an alarmingly high rate of seventy-six per cent in Africa compared to sixty-eight per cent in South America, fifty-six per cent in East Europe and forty-four per cent in Asia. Over the same period, twenty four per cent Africans residing in urban areas were victims of theft and damage of vehicles. The similar percentage for burglary was thirty-eight per cent, other theft forty-two per cent, and assault and other crimes of personal contact, thirty-three per cent.

Crime statistics further show that since the early 1990s, urban violence has become increasingly associated with marginalized youths with drug habits. Given this, economic and social policies that target African offer the most promise breaking the cycles of crime and violence in our continent.

At an international symposium on youth crime held in Abidjan, Côte d'Ivoire, 5-7 May 1997, Mr. Alain Sissoko of the Institute of Criminology, University of Abidjan made a revealing observation about street children: "Most of the street children do not regret their leaving school since they believe that one can lead 'an accomplished social life' on the street. These youths deeply resent the society which, in their opinion, does not care for them and which they find oppressive, dominated as it is, by a money-oriented mentality. Though they criticize their families, these marginalized youths still project a positive image of the family in spite of their situation. This can be understood as a desire not to suffer a social exclusion from their homes".

Such observations offer us insights into the types of interventions required to deal with the re-education and social re-integration of minors in our societies. For various reasons, past efforts in many of our cities have yielded very paltry results. In order to move ahead in this area, the political leadership must be there to take charge of marginalized youths in our societies. However, the job cannot be governments alone. It requires the partnership of parent associations, local community organizations and other non-governmental institutions. Development alone will not provide a solution to crime and violence. Concerted action is required to address the marginalization of youths and their rehabilitation.

Economic development and growth will also not necessarily address the poverty problem in our urban centers. Strategies for reducing poverty in Africa and making cities safer, must have as their goal enabling poor people to be more productive; achieving universal access to basic services (health, education, water, sanitation, housing); improving basic infrastructure; and providing safety nets for the vulnerable groups. In other words African cities will become safer to the degree that poverty is reduced.

SEMINAR ON ENVIRONMENTAL AND NATURAL RESOURCES ACCOUNTING

Many African countries are endowed with rich natural resources such as forests, minerals and fisheries. Over the few decades, Africa has experienced rapid depletion of its natural resources. But the standard of living in many parts of the region has declined. One may suspect that many African countries have consumed much of the revenues generated from natural resources instead of making adequate investments. To improve the standard of living, net investments must be positive most of the time, and hopefully increasing over time.

In the computation of GDP and national income, the System of National Accounts (SNA) fails to recognize the full monetary value of natural resources and environmental services as factors of production or productive assets. The cost of environmental degradation and resource depletion are not subtracted from GDP. The result is an overestimation of the benefits of economic activities. The system for Integration Environmental and Economic Accounting (SEEA) can help correct such flaws and make the SNA more accurate. It can also be a tool to facilitate the distribution of investment to various areas of the environment or to identify beforehand the payers and beneficiaries of the policies envisaged.

Four African countries, namely: Ghana, Namibia, South Africa, and Zimbabwe recently experienced the SEEA. While it is early to assess their results, there were several prerequisites, mainly: effective and detailed database; technical skilled local staff in various ministries; economic and environmental research capacity; etc.

The overall objectives of the seminar was to support the efforts of African governments to identify, capture, and use resource rents for economic development effectively. The seminar raised awareness among participants of the potential contributions that the System of Integrated Environmental and Economic Accounting (SEEA) as a planning tool can make to Africa's economic development. In the context of development challenges facing Africa in the coming millennium, the seminar introduced the System of Integrated Environmental and Economic Accounting (SEEA) and its potential policy uses, disseminated the experience of several countries that have experimented with natural resource accounting and called for support from both African governments and the international community for the application of the SEEA in Africa.

Thirty-four high level participants representing eleven member States, five UN organs (FAO, UNDP, UNEP, UNESCO and UNSD/DESA), four institutions (NESDA, OAU, SESRTC and WWF) and four ECA/SRDCs (Northern, Eastern, Central and Western Africa) attended the seminar.

The seminar gave an opportunity for new partnership between ECA, WWF, ADANAC Pvt. Ltd. Zimbabwe, UNEP and UNSD/DESA. These institutions provide the seminar with speakers on topics of the agenda. The Statistical, Economic and Social Research and Training Center for Islamic countries funded participants from three African countries.

The seminar recommended as follow-up activities:

- Generate demand for, and promote application of, environmental and economic accounting;
- Build and strengthen capacity for implementing integrated environmental and economic accounting
- Conduct focused, practical case studies based on the framework of the UN and System of Integrated Environmental Economic Accounting (SEEA);
- Develop and consolidate database for implementing integrated environmental and economic accounting;
- Apply integrated environmental and economic accounting information to policymaking; and
- Strengthen regional coordination.