

**ACTIVITIES OF THE UNITED NATIONS UNIVERSITY  
INSTITUTE FOR NATURAL RESOURCES IN AFRICA (UNU/INRA)  
IN THE FIELD OF WATER RESOURCES\***

**BY**

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## **INTRODUCTION**

The United Nations University Programme on Natural Resources in Africa programme was started in April 1990 as a prelude to the launching of the United Nations University Institute for Natural Resources in Africa (UNU/INRA). This Institute was established in 1985 after a detailed multi-disciplinary feasibility study but due to unforeseen circumstances, it did not take off as planned. Since early 1991 the programme has been temporarily headquartered in the UNESCO Regional Office for Science and Technology in Africa (UNESCO/ROSTA). With the recent signing of an agreement between UNU and the Government of Ghana for the location of the Institute in Accra, the UNU/INRA will move to its permanent site in Ghana by October 1993. A Mineral Resources Unit is permanently located at the School of Mines in Lusaka, through a Memorandum of Understanding signed between the UNU and the Government of Zambia.

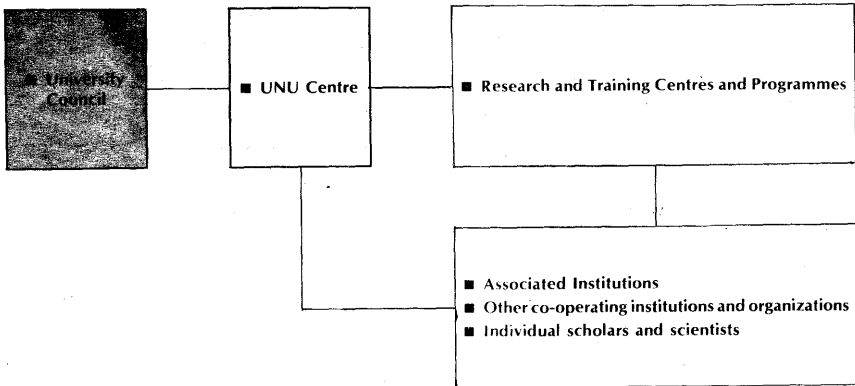
## **OBJECTIVES OF UNU/INRA**

Briefly speaking, the key objective of UNU/INRA and its current programme is human resource development and institutional capacity building through networking with African Universities and associated research institutes in advanced research/training (Fig 1) and dissemination of knowledge and information on the conservation and management of Africa's natural Resources and their rational utilization for sustainable development.

Based on extensive consultations with African Scientists, leaders and relevant functionaries of Government of African countries and national and international institutions and organisations in addition to the Lagos Plan of Action of the Organisation of African Unity, the following were identified as the main objectives of UNU/INRA.

- to undertake work in the area of natural resources within the overall Programme;
- to help African and other developing countries better appreciate and mobilize their natural resources endowment for the benefit of their people;

## Organization



## The UNU Network



- UNU/WIDER – World Institute for Development Economics Research (Helsinki, Finland)
- UNU/INTECH – Institute for New Technologies (Maastricht, Netherlands)
- UNU/IIST – International Institute for Software Technology (Macau)
- UNU/INRA – Institute for Natural Resources in Africa (Main location to be decided; a unit in Lusaka, Zambia.)
- UNU/BIO-LAC – Programme for Biotechnology in Latin America and the Caribbean (Caracas, Venezuela)
- ▲ Geothermal Energy (Iceland)
- ▲ Food Technology in Africa (Ghana)
- ▲ Nutrition and Health (Guatemala, Thailand, UK)
- ▲ Food Science & Technology (India, Indonesia, Japan, Korea)
- ▲ Food Policy and Planning (Kenya, United States)
- ▲ Microprocessors and Informatics (Cameroon, Ireland, Italy)
- ▲ New and Renewable Sources of Energy (India)
- ▲ Energy Systems and Technology (Colombia)
- ▲ Remote Sensing (Brazil)
- ▲ Science and Technology Policies (Brazil)
- ▲ Development Economics (Bangladesh)

**FIG. 1. THE UNITED NATIONS UNIVERSITY ORGANIZATION AND NETWORK**

to promote the development of natural resources through the generation and application of scientific knowledge, innovative technology approaches for productive work, and the formulation of planning and policy options;

to increase understanding of the socio-economic and other aspects of natural resources in the context of self-reliant development; to contribute to strengthening of national and other institutions and building endogenous research, development and consultancy capabilities in Africa and other developing countries with respect to their natural resources endowment;

to encourage inter-disciplinary research and dissemination of knowledge in the area of natural resources; and

to make the knowledge available to scientific communities everywhere, particularly in the developing countries.

### **PRIORITY PROGRAMME AREAS**

Africa is facing a food crisis and must increase her agricultural production in order to attain food security and acceptable standards of living. Consequently, the following programme priority areas were identified as necessary if the continent is to successfully harness her rich resources of Natural Resources for the benefit of Africans:

1. **LAND USE** with respect to conservation of land resources and improved integrated management of the physical and biological resources of major ecological zones to satisfy multiple land use requirements.
2. **WATER RESOURCES**, including ground and surface waters in various ecological zones, in relation to integrated river basin development and water transfers and alternative management strategies to satisfy various uses of water.

3. **PLANT RESOURCES**, in relation to the management and utilization of plants to satisfy nutritional, economic and social needs, including their use for drugs; various industrial purposes; and to satisfy environmental and agroforestry requirements, in addition to the use of biotechnology to achieve objectives in the most cost-effective and innovative manner.
4. **ANIMAL RESOURCES**, with respect to pasture ecosystems studies, conservation, improved management and rational utilization of wildlife, and fisheries resources including their genetic manipulation to enhance their uses as sources of food and other useful products.
5. **MINERAL RESOURCES**, with a high priority given to mineral exploration, mineral law, mining development, mineral processing for internal use and industrialization as well as mineral policy and training related to these; and
6. **ENERGY** with particular emphasis on fuelwood and efficient afforestation, development of integrated hydroelectric projects, energy conservation schemes and promotion and support of building alternative energy planning, research and development capabilities.

To deal in detail with all these important areas would somewhat detract from the main theme of this Symposium which simply put means "Sustainable use of Mine Drainage Waters". This paper will therefore dwell on water Resources activities in the broader context of the UN System and the UNU/INRA programme in particular.

At the UN level, of the Five constituent Councils of the General Assembly, (Fig. 2) the Economic and Social Council steers the committee on Natural Resources. The United Nations Department of Technical Cooperation for Development (UNDP) was established by the General Assembly in 1978. The Department's multisectoral expertise covers the fields of water, mineral and energy resources, infrastructure, development planning, statistics, public administration and finance, population and social development.

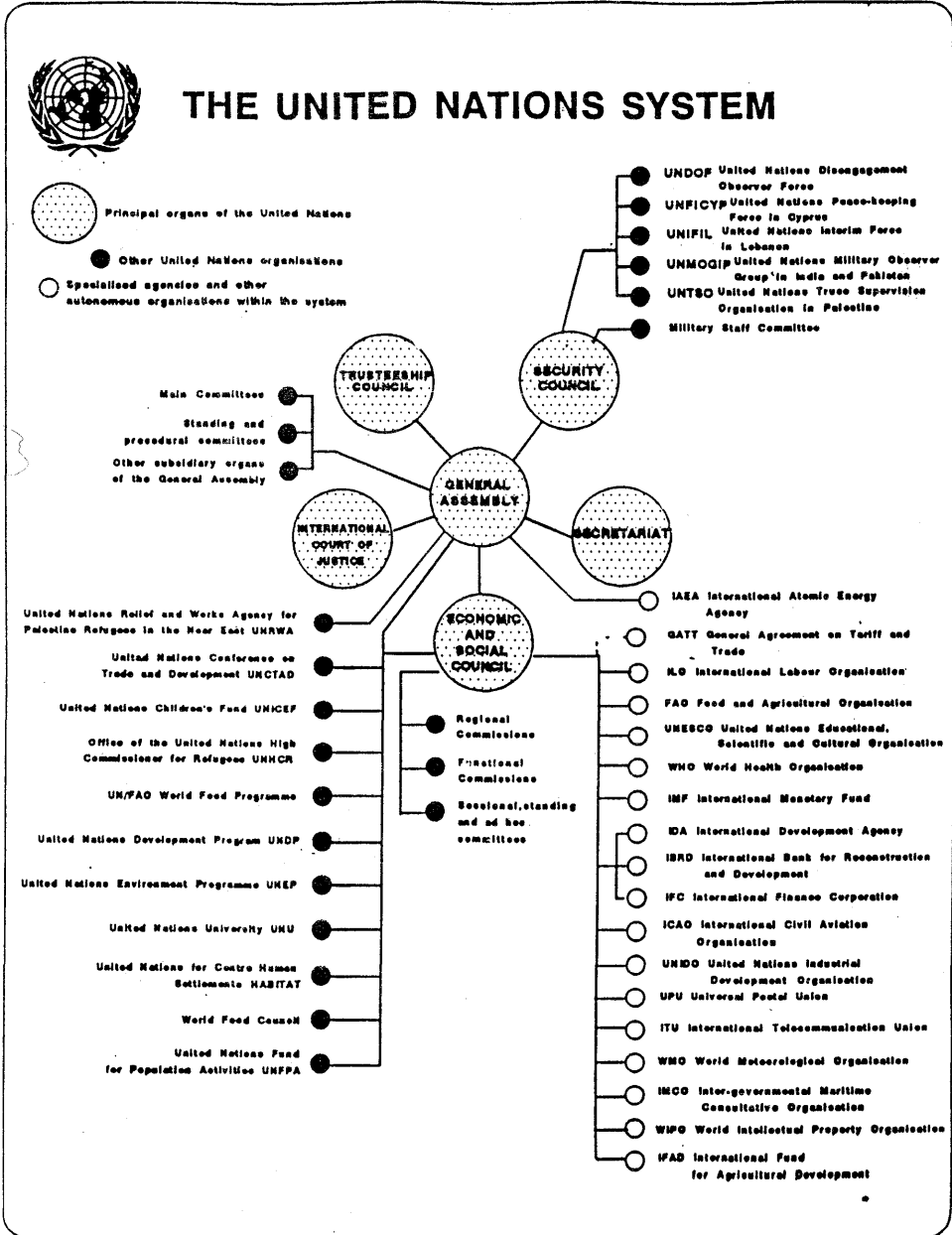


FIG. 2. The United Nations System

Following below is an outline of UNDTCD's work in the field of water resources:

1. Water for growth and Progress: UNDTCD helps developing countries develop and manage their water resources.
2. Finding and developing water resources: The widespread availability of ground water, its amenability to low cost, staged development and its relatively good quality make it an almost ideal resource. Over the past 25 years UNDTCD has carried out about 120 major ground water projects.
3. Water Planning and Management: UNDTCD conducts hydro-geological and hydrological surveys and offers technical assistance in rural water development in many parts of the world.
4. Protecting tomorrow's supplies: assistance is offered to developing countries throughout Africa, Asia and Latin America in formulating laws and pricing policies which encourage efficient water development and reduce water loss.
5. Developing self-reliance: A key element of UNDTCD work is human-resources development. The water resources branch holds seminars and workshops on all aspects of water use and training to national staff whenever possible.

The year 1992 was a year of change for the United Nations Technical Cooperation Programme in Water.

The Department of Technical Cooperation for Development (UNDTCD) was merged with the Department for International Economic and Social Affairs, the Centre for Transnational Corporation and the Centre for Science and Technology. The Resulting synthesis of technical cooperation and research

is the Department of Economic and Social Development (DESD). The focus of the New Department remains technical cooperation and this is now strengthened by the research and coordination capacities that have been absorbed.

Science, Technology, Energy, Environment and Natural Resources, is one division of DESD. A look at the first 4 of the six priority areas of the UNU/INRA Programme areas reveals that water is an important parameter in the sustainability of all of them. The Natural Resources Committee of the UN is keenly concerned with the availability and sustainability of resources. This involves the assessment of how resources needs can be met in the context of other requirements for land utilization and environmental conservation. In view of the overwhelming importance of water as a main carrier in the biochemical cycle, an ecosystems approach requires a detailed inventory of biological data, in particular with regards to fisheries, waterborne diseases eutrophication and biological indicators. A holistic approach to water and land management has therefore been recommended. This would require the integration of water and soil strategies. Soil is also a resource for minerals for natural ecosystems as well as for agriculture. These interrelationships and linkages have played an important role in the formulation of priority areas of activity in the UNU/INRA programme.

### **REASONS FOR EMPHASIS ON STRENGTHENING OF AFRICAN UNIVERSITIES**

In this age of sustainable development which calls for multi-disciplinary holistic or systems approach in research, training and extension with emphasis on grass roots popular participation, most African Universities remain isolated from national research systems and from development activities and programmes. Yet with the shortage of trained men and women in several disciplines and at different levels, the African University of which there are now over 100, constitutes in each country the location with the highest concentration of high level trained personnel.



Furthermore, African Universities have the academic freedom to conduct the full scope of basic, strategic, applied, maintenance and developmental research necessary for sustainable development which requires sound basic knowledge of natural resources; and the African environment.

Strengthening of selected Universities through networking in the UNU/INRA College of Research Associates is necessary because of the current adverse economic problems facing African countries under structural adjustment and heavy debt burdens. Major constraints they face include:

- . Lack of funds or inadequate and erratic funding;
- . heavy teaching loads and limited research;
- . low level of acquisition of up-to-date text books and journals.
- . low motivation and brain drain;
- . limited graduate training;
- . low number of students in science, natural resources and technology training.

The programme will function through a network of a College of Research Associates in different Universities by taking advantage of the differential strengths of their scientific staff, individuals or departments selected on the basis of qualifications, experience, track record and interest in various aspects of natural resources R & D in the UNU/INRA Programme priority areas.

### **PLANNED ACTIVITIES IN UNU/INRA WATER RESOURCES**

The main activities here will start with the setting up of data-base as a component of the geographical information system (GIS); encompassing data and information existing on water bodies, policies and programmes related to their utilization, pollution problems, etc. , cataloguing institutions engaged in water research and development including individuals. Initiation of core literature acquisition including relevant journals.

Research and Development areas will include:

- . inventory of water resources;
- . setting up of a network for water resources;
- . status and quality monitoring;
- . survey of traditional water harvesting and conservation techniques;
- . drinking water management and associated problems;
- . Industrial water management and problems;
- . river basin water management including interbasin water transfer policies and programmes;
- . irrigation, water management and associated problems;
- . water use planning and associated policy issues;
- . coastal water resources management and use; and
- . aquatic water resources management and use.

### **PROGRAMME ACTIVITIES**

**Institutional Capability Assessment:** This was aimed at appraising the human resources and institutional capabilities in terms of equipment, and facilities for R & D and status of their research and training activities as a basis for identifying prospective College of Research Associates members and institutions for collaboration with UNU/INRA.

**Consultative Meetings:** These were held in Lusaka, Zambia for East and Southern Africa and Accra for Central and Western Africa and were aimed at rapid diagnostic assessment of the natural resources and encouraging a participatory approach to problem identification as a basis for focussing UNU/INRA activities on constraints for which there is a consensus among prospective collaborators.

**Training Course:** This was held from 12 - 31 August 1991. Known experts in relevant priority areas gave lectures and demonstrations. Topics covered for the Water Resources component dealt with the extent, utilization and constraints to water resources management to sustainably satisfy the multifarious needs for drinking, other domestic uses, industry irrigation etc.

**Field Surveys:** These constitute the last phase of the preliminary programme activities and most of them have been completed. Target information for soil and water resources has concentrated on their conservation, management and constraints to their utilization for sustainable development.

Information gathered from above activities is to be used for the formulation of specific research priorities. The initiation of research and related activities in Phase II is being preceded by efforts directed at developing key-headquarters facilities at the Legon Campus of the University of Ghana.

### **CONCLUDING REMARKS**

Although the UNU/INRA programme has taken time to get off the ground and currently lacks resources it promises to contribute significantly to sustainable development in Africa. Reasons for this include the following facts.

Its programme is focussed on Natural Resources the conservation of which are necessary for sustainable development.

The UNU/INRA programme has built-in environment and development concern.

It involves many countries and covers several disciplines thus facilitating collaborative and regional approach to institutional strengthening.

The institute is decentralized and does not operate from a large bureaucratic institute.

Focus is on the major constraints in Natural Resources management of the day, human resource development and institutional capacity building.

Foreign assistance to UNU/INRA has built-in coordination which has remained a problems in Africa in the past.

With UNU located in Japan, UNU/INRA has a lot to gain from collaboration with Japanese Universities and research institutions that are centres of excellence and some of whose staff are experts in various aspects of natural resource management. Some are in fact already working in African Universities. Such as the University of Zambia on soils of the African Savannas.

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