

The Environment and Sustainable Development Programme at UNU Centre

Sustainable Development

Background

Poverty and the deterioration of our natural environment are the two most pressing problems facing humanity today. In order to meet development needs and eradicate poverty, it is vital to utilize natural resources in a sustainable manner while minimizing their depletion and pollution.

Some 1.3 billion people worldwide live on less than US\$1 per day, while 80 per cent of the world's resources are consumed by 20 per cent of the world's population. If everyone were to live like those 20 per cent, we would need four planets to provide all the resources necessary.

The Earth imposes two kinds of constraints on human activities: (1) the limitation 'of finite resources and (2) the coping capacity of ecosystems. Seventy-three per cent of people living in poverty are rural poor who depend on natural resources for their survival, yet they often live in marginal or unsuitable farming areas and fragile ecosystems.

We now recognize that some natural resources will eventually be depleted. The developed countries, therefore, must acknowledge their responsibility and clarify their intentions to convert their economic systems to minimize resource and energy consumption.

The Concept of Sustainable Development

“Satisfying present needs without compromising the ability of future generations to meet their own needs” [Brundtland Report, 1987]

In 1983, the World Commission on Environment and Development - tasked with preparing an environmental perspective to the year 2000 and beyond - linked environmental issues to economic and social development. In 1992, the UN Conference on Environment and Development produced a comprehensive action plan that integrated environment and development.

The Millennium Development Goals

An ambitious agenda for reducing poverty and improving lives, with specific goals and targets set for 2015 based on a 1990 benchmark, the Millennium Development Goals (MDGs) are to eradicate extreme poverty; achieve universal primary education; promote gender equality; reduce child mortality; improve maternal health; combat HIV/AIDS, malaria and other diseases; ensure environmental sustainability; and develop a global partnership for development.

The specific targets to ensure environmental sustainability are to integrate the principles of sustainable development into country policies and programmes, and reverse the loss of environmental resources; halve by 2015 the proportion of people without sustainable access to safe drinking water and basic sanitation; and achieve significant improvement in the lives of at least 100 million slum dwellers by 2020.

The World Summit on Sustainable Development

“We recognize that poverty eradication, changing consumption and production patterns, and protecting and managing the natural resource base for economic and social development are overarching objectives of and essential requirements for sustainable development.” [Declaration on Sustainable Development]

In August 2002, at a ten-year review of the targets and goals set at the United Nations Conference on Environment and Development in 1992 and in Agenda 21, the international community agreed at the World Summit on Sustainable Development (WSSD) on a Plan of Implementation. Its main goals are to eradicate poverty; change unsustainable patterns of consumption and production; protect and manage the natural resource base of economic and social development; and achieve sustainable development in a globalizing world, taking particular notice of the correlation between health and sustainable development.

The Environment and Sustainable Development Programme

The Environment and Sustainable Development (ESD) Programme focuses on the integration of economic, social and environmental aspects towards a balanced holistic concept of sustainable development.

The ESD Programme is one of two programme areas of the UNU system. The ESD team is located at the UNU Centre and is specially devoted to thematic programme areas. It aims to contribute to generating solutions to global environmental challenges. In particular, it targets the interaction between human activities and the natural environment, and its implications for sustainable development. It brings pressing issues to the forefront of international discussion. The basic issues of human survival, development and welfare are at the core of the themes covered within the realm of the ESD Programme.

A Multidisciplinary Approach

The ESD Programme adopts a multidisciplinary approach combining natural and social sciences. In implementing its activities, the Programme makes special efforts to include global perspectives as well as perspectives from developing countries and from countries with economies in transition. Networking and capacity development, particularly in developing countries, are given high priority.

Main Activities and Products

The main activities and products of the ESD Programme are:

- basic research in cooperation with an international multidisciplinary network of scholars;
- policy studies and analysis to synthesize research into policy-relevant prescription;
- dissemination of the results of its activities through articles, books, conferences, symposiums and workshops;
- capacity development for developing country representatives, policy makers, and the international academic and policy communities.

Guiding Principles and Values

The ESD Programme strives to adhere to the following guiding principles - that its activities:

- be relevant to, and based on, the working mandates of the UN and its specialized agencies;
- focus on developing countries;
- assist in making informed decisions on environment and sustainable development issues;
- strengthen the involvement of marginalized stakeholders in international decision-making processes (through capacity development and information management);
- further multinational and multidisciplinary research collaborations.

Long-Term Perspective

A key focus for UNU and its ESD Programme will be to contribute to the achievement of the Millennium Development Goals. The Programme will also enhance cooperation to ensure constructive cross-fertilization and continue to strengthen its capacity development

activities. It will carry forward its work related to the WSSD outcomes (including education for sustainable development), bringing together international organizations leading in science, technology and education. The future programmatic work will provide research on pressing global problems that are of relevance to the UN and its members, as well as address critical gaps in understanding the underlying root causes of existing problems or the lack of capacities to address them.

Project Activities

The ESD Programme is structured under several themes crucial to sustainable development. Its activities are carried out on a project basis, with the projects implemented by Programme Officers and affiliated faculty. ESD projects cover diverse and complex thematic areas, aiming to generate new solutions and foster their development.

ESD Themes and Projects

Management of Fragile Ecosystems

- **Managing Agro-diversity**
- **Sustainable Land Management in Drylands**
- **Mountains and Forests**

Water Crises

- **International River and Lake Basins Management**
- **Managing Basin Water Cycle for Sustainable Water Resources Development**
- **Terrestrial and Coastal Hydrosphere**

Sustainable Urbanization

- **Multi-Hazard Risk Assessment**
- **Innovative Communities Initiative**

Environmental Governance and Information

- **Forum for Globally-Integrated Environmental Assessment Modelling (GLEAM)**
- **Information Society and Environmental Issues**
- **Inter-Linkages: Synergies and Coordination Among Multilateral Environmental Agreements (MEAs)**

Associated Initiatives

- **The Global Environment Information Centre (GEIC)**
- **Zero Emissions Forum (ZEF)**

URL: <http://www.unu.edu/esd>

Management of Fragile Ecosystems

The international community has agreed on an ecological and participatory approach to natural resource management to assure productive and healthy ecosystems by blending social, economic, physical, and biological needs and values.

Managing Agro-diversity

One-third of the world's land area is used for agriculture. A harmonious co-existence of biodiversity and agriculture is a major challenge to achieve the twin goals of conserving biodiversity and improving rural livelihood and food production. Our understanding of the multiple goods and services provided by the different levels and components of biodiversity, and the relationship between diversity, resilience and production in agro-ecosystems, is severely limited and requires additional research. There is also an urgent need to strengthen capacities of farmers and indigenous and local communities.

Farmers, in collaboration with scientists promoting biodiversity friendly practices, can conserve biodiversity and prevent land degradation in agro-ecosystems while improving their own livelihoods. The best practice will be scaled up through regional training programmes and information exchange, building on the experiences of previous programmes and relevant research results.

Sustainable Land Management in Drylands

Drylands contain some of the world's most fragile ecosystems. More than 2 billion people live in drylands, and many of them confront daunting challenges in securing their daily subsistence in the face of limited water and natural resources. One of these challenges is desertification, the impacts of which are severe on both human society and ecosystems. Past responses to desertification have tended to focus on technological solutions while overlooking socio-economic and site-specific constraints. It is necessary to shift from the one-size-fits-all approach to an adaptive learning approach that emphasizes capacity development of stakeholders through learning from the past and from others on sustainable land management in drylands. This project aims to promote learning and sharing of experiences through interdisciplinary action, research, capacity-building components and workshops.

Mountains and Forests

The degradation of mountain ecosystems - home to some 600 million people and the source of water for more than half the world's population - threatens to seriously worsen already existing global environmental problems, including floods, landslides and famine. Sustainable forest development has been recognized as critical for maintaining the balance between the natural and the human environments in mountain areas, as well as in a broader context. The project on Sustainable Land Management in the High Pamir and Pamir-Alai Mountains an Integrated and Transboundary Initiative in Central Asia is a demonstration and capacity-building project concerned with conserving land and water resources, and biological diversity, in managed high-altitude semi-agricultural ecosystems in Tajikistan and Kyrgyzstan. The project on Forest Policy and Economics Education and Research (FOPER) focuses on forestry sectors in the Western Balkan region where UNU is developing on-line learning modules in partnership with local academic and research organizations.

Water Crises

Research projects under this theme seek solutions to sustainable environmental and political management of critical water resources that ensure an adequate quality and quantity of water for all. They are in line with calls for developing integrated water resources management frameworks, including integrated coastal area and river basin management, and preparing and implementing water management action plans at the country level.

International River and Lake Basins Management

Some 60 per cent of the world's population reside in the more than 200 international water systems in the world. This is an indication of the critical importance of developing effective mechanisms for the sustainable management of international basins. This project intends to bring innovative perspectives of international water management to the forefront of global discussions, both in the academic and policy-making spheres. Besides the hydro-politics surrounding the disputed Gabčkovo-Nagymaros project on the Danube (between Hungary and Slovakia) and in the Euphrates-Tigris River Basin, field-oriented project activities are focusing to study the Yali Falls Dam Project (between Vietnam and Cambodia).

Managing Basin Water Cycle for Sustainable Water Resources Development

Population growth and per-capita water consumption growth lead to over-exploitation of finite freshwater resources, with unexpected consequences in the form of land subsidence and water-quality deterioration. This project promotes sustainable water resources development and integrated water management through a sound scientific understanding of the basin water cycle. Modelling of hydrology as well as rainfall are being carried out in the Mekong, Kothmale (Sri Lanka) and Chao Phraya Basins in partnership with local organizations.

Terrestrial and Coastal Hydrosphere

A holistic approach toward effective management of two critical environments (terrestrial and coastal hydrosphere) is fundamental to maintaining human prosperity and security. This project comprises three clusters:

- The Drinking Water Cluster implements case studies on community-level safe drinking water management in developing countries using slow sand filtration methods. Understanding the arsenic removal capability of this method is also indispensable to the selection of water sources. The applicability of slow sand filtration mobile units as disaster reconstruction facilities will be assessed and discussed.
- The Ocean Management Cluster deals with research in relation to sustainable coastal management and disaster reduction designs toward sustainable development. A research network on marine and coastal ecology and social and policy science will be fully employed.
- The Chemical Management Cluster builds chemical analysis capacity for environmental pollutants, such as persistent organic pollutants (POPs), in Asia through training and monitoring practice in participating countries. The focus is to provide problem-driven and policy-relevant solutions for sound chemical management.

Sustainable Urbanization

Nearly half of the world's population now live in urban areas (compared with a little more than one-third in 1972). The other half, meanwhile, has increasingly become dependent upon cities for their economic, social and political development. Considering that by 2030 nearly 65 per cent of the global population will be living in urban areas, sustainability of urban areas - as well as the process itself - is of vital importance to the global community. Two ESD projects address issues relevant to the production process and human security to ensure sustainable urbanization.

Multi-Hazard Risk Assessment

Ensuring human security against natural hazards is an important component of a sustainable urbanization process. This project focuses on two areas that address these issues:

- Multi-Hazard Risk Assessment with Dynamic Spatial Information focuses on assessing and reducing human vulnerability to disasters by looking at the dynamic behavioural patterns of urban communities to understand the vulnerabilities brought about by urban infrastructure (such as impervious areas and underground spaces). A modeling study on city flooding, including in underground spaces, using high-resolution spatial data has been completed.
- Catastrophic Flood Risk Assessment in the Asia-Pacific Region conducts a modelling study to understand the nature of catastrophic floods in different countries in the Asia Pacific through analysis of catastrophic flooding in major cities. The study considers worst possible flooding scenarios to prepare for the “unforeseen.” €35

Innovative Communities Initiative

This project studies the concept of “innovativeness” as applied to the community level, and explores its implications in managing the local environment. It was developed based on the realization that change and innovation at the community level are critical to creating a sustainable society. Through research and training activities, the project aims to develop a framework of innovative communities and to promote its wide application by communities for their environmental management endeavours in and beyond the Asia-Pacific region, as well as by stakeholders working with communities.

Environmental Governance and Information

Environmental governance refers to the system by which policies are developed and implemented in response to or in anticipation of environmental challenges. The management of information flows in these policy processes is key to their success, including communication of research results to policy makers, feedback from individual and local levels to national governments and vice versa, and the coordination of various levels of institutions, regulations and implementation efforts. The projects under this theme focus on enhancing environmental governance through providing better information to decision makers. This goal is achieved through a combination of research and the creation of opportunities for policy dialogue.

Forum for Globally-Integrated Environmental Assessment Modelling (GLEAM)

The GLEAM Forum is an exchange platform for discussions and brainstorming on the issue of globally-integrated environmental assessment. Integrated assessment incorporates the environment as a natural system, human development activities, and the interaction between the two. The need for integrated assessment is steadily growing, and it is becoming increasingly feasible as the basic methodologies adopted in each of these three components have improved.

Information Society and Environmental Issues

The focus of this project is on the environmental assessment and management of the information technology (IT) revolution. The objective is to engage in quantitative research on key areas in the field, to act as direct input for policy makers, firm strategies and consumer behaviour. In the environmental management of IT equipment, extension of life span is a key strategy for governments, firms and civil society to consider as a future response. IT-driven shifts in business models and lifestyles, such as e-commerce and telecommuting, are also important issues to consider from an environmental perspective. About 260 kg of fossil fuels and at least 22 kg of chemicals are required to make a desktop computer system. Considering the rapid technology cycles that lead to short usable lifespans, the net energy cost of owning a computer (including its manufacturing) is greater than for a refrigerator.

Inter-Linkages: Synergies and Coordination Among Multilateral Environmental Agreements (MEAs)

The Inter-Linkages Initiative is an innovative approach to managing sustainable development. Since environmental management is affected by the interaction between humanity and nature, Inter-linkages promotes greater connectivity between ecosystems and societal performance. Its main focus is on capacity development and implementation efforts at national and regional levels to achieve integrative, practical solutions to connected environmental problems. Inter-linkages activities are undertaken jointly with international, regional and national partners in order to ensure close ties between realities and challenges at national levels, as well as decision-making processes and policy responses at regional and international forums. Specific attention is paid to the functional aspects of environmental governance - among them, institutional coordination, information and knowledge management, and compliance and enforcement.

Associated Initiatives

A Holistic View of Environmental Transitions UNU-ESD Summer School

This two-week course, accommodating over 45 hours of lectures by 15 professors and professionals, provides opportunities for graduate school students in the field of environmental research to become familiar with a variety of views on the environment. ESD considers this course as an opportunity to test the effectiveness of teaching materials for Japanese society.

Decade of Education for Sustainable Development

The United Nations Decade of Education for Sustainable Development (DESD) started in 2005. While another UNU research and training centre is taking leadership of DESD within UNU, the ESD Programme cooperate with the UNU Media Studio to play a key role in creating new and effective teaching materials content for several countries.

GEIC

The Global Environment Information Centre (GEIC) was established in 1996 as a joint initiative of UNU and the Japanese Ministry of the Environment. Its main objective is to support the involvement of major groups identified in the United Nations' Agenda 21 in implementation efforts for sustainable development. It therefore undertakes specific activities to better engage various stakeholders - such as governments, non-governmental organizations and the private sector - in international and domestic environmental processes.

UNU and the Ministry work together to utilize each other's comparative advantages in designing and implementing the GEIC programme, including national environmental networks as well as global interaction and links within the UN system. To strengthen sustainable development networks, both internationally and nationally, GEIC aims at:

- capacity development activities, conferences and interactive events
- research on environmental governance and practical case studies
- provision of environmental data and information to multiple civil society groups through its library, database and publications.

Zero Emissions Forum

The concept of Zero Emissions, born at UNU in 1994, is becoming one of the major leading principles towards achievement of a sustainable society as an alternative to the current mass consumptive society. A core component of the Zero Emissions approach is the concept of integrated industrial systems in which waste products of one industry/sector become value-added inputs for another. It promotes practical approaches to environmental sustainability and the application of science and technology with participation from academia, local governments, business and citizens.

About UNU

United Nations University seeks to contribute, through research and capacity building, to efforts to resolve the pressing global problems that are the concern of the United Nations, its Peoples and Member States.

In 1973, the United Nations General Assembly gave UNU a challenging mission: to develop original, forward-looking solutions to the world's most pressing problems and help build capacity, in particular in developing countries. Today, three decades later, UNU's mission is even more important, but major shifts have made it more complex. While globalization, rapid technological advances and economic shifts favouring knowledge-based economies offer great opportunities, they also present great challenges - even threats - to many countries.

To world decision makers, UNU offers fresh, alternative views on today's problems, proactive analyses of emerging problems and sound policy options to address them. UNU forms and cooperates with networks of partners (universities, research institutes and other relevant institutions) around the globe.

UNU provides specialized training throughout the world. Its "faculty" is an international network of scholars and other experts, while its "students" are mainly young researchers and other professionals (in particular, from developing countries) who receive postgraduate training as UNU fellows or benefit from UNU's other capacity-development activities.

UNU has five key roles, serving as:

- an international community of scholars
- a bridge between the United Nations and the international academic community
- a think-tank for the United Nations system
- a builder of capacities, particularly in developing countries
- a platform for dialogue and new and creative ideas

For More Information

UNU's Internet website provides direct access to the University's research and training activities. A bimonthly on-line newsletter, UNU Update, makes the University's work and research more accessible worldwide by offering a concise summary of news with links to more complete information.

Publications

UNU produces academic publications through its own UNU Press and other publishers, and cooperates in the production of five professional journals. Periodicals and newsletters also describe ongoing research and developments within the Environment and Sustainable Development Programme.