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UNU Partnerships and Activities to Implement Agenda 21
The obvious decline in the condition of the natural environment has generated a global level appreciation of the urgency with which we prepare for the WSSD. This reality points to the core consideration that the goals of sustainable development must be more effectively mainstreamed within the broader global political agenda. And this is why the Johannesburg World Summit on Sustainable Development is so crucial. The summit has the potential to serve as a turning point in the way that the international community pursues the goal of sustainable human development.

The Johannesburg Summit MUST signal a new, global level, appreciation of the need to approach sustainable development in a more – comprehensive – strategic - and integrated manner.

Hans van Ginkel
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United Nations University
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**Poverty Eradication**

A focus on the eradication of poverty is paramount to the success of the Summit. In order to move forward on the issue, we need to concentrate on the lessons learned since the Rio Summit in 1992. Key lessons include the need to focus on both sides of the reciprocal relationship between environment degradation and poverty. It is also important to give priority to improving the ecosystems and resources upon which the poor depend (e.g. water) and to endorse the ownership of essential support systems by the poor themselves. Other lessons include the importance of giving priority to pre–growth stage of economic development rather than relying on ‘trickle down’ economic approaches. Empowerment of the poor is, for example, a core pre–condition for sustainable development and equitable environmental problem solving.\(^1\) In addition, there is a need to upgrade the fiscal system in many countries to ensure that any savings from debt relief are effectively and speedily translated into pro–poor spending (particularly primary education and basic health services).

Given the scale and depth of poverty in the developing world, fast poverty reduction is imperative. It is not only the case that people’s incomes must be increased through better livelihoods in smallholder agriculture and micro–enterprises. It is also crucial that human development be raised directly, through better basic health care, higher quality primary education, and investment in safe water and sanitation. Given the large demands that these pro–poor investments will place on the scarce financial and managerial resources of countries, close attention must be paid to the setting of priorities. At present, national priorities are often ill–defined as a result of underfunded and underdeveloped budgetary and planning mechanisms that are a reflection of fiscal problems and, in many countries, social conflict. This has meant that opportunities for accelerating poverty reduction are often missed.

**Conflict and Poverty**

Conflict, both civil war and war between states, is highly destructive of human capital and of development more generally. UNU research has demonstrated the importance of reducing the gap between rich and poor in an effort to ensure that grievances are not available to be exploited by unscrupulous leaders. In particular, this research highlighted the importance of ensuring a fair and equitable allocation of public spending on basic services (across ethnic groups and regions), as well as a fair allocation of the burden of taxation. If peace can be secured, then it is vital to engage in early economic and social reform to shift

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\(^1\) A useful resource for policymakers is the UNU/WIDER’s income inequality database (the World Income Inequality Database found online at http://www.wider.unu.edu/wiid/wiid.htm) which tracks inequality over time and across countries, enabling national policymakers and their donor partners to give more attention to inequality–poverty linkages.
resources to pro–poor spending so that the most vulnerable can speedily rebuild their human capital and livelihoods. Unfortunately, the reconstruction process often leaves the poor behind, resulting in the creation of further grievance and an unsustainable peace.

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Water

Arsenic Poisoning

The pollution of groundwater – the primary source of drinking water – by arsenic in West Bengal (India), Nepal and Bangladesh has led to a crisis of unprecedented proportions. Some recent estimates show that more than 35 million people are potentially at risk from drinking arsenic-contaminated water (Smith et al., 2000) – this indeed brings the problem to a catastrophic scale. In comparison, the current estimate of people possibly infected by the HIV virus all over the world is around 34 million (UN AIDS, 2001). The sheer magnitude of this disaster means that we face new and unique challenges and tasks.

Awareness about the pollution of drinking water with arsenic and the significance of the crisis has risen significantly during the 1990’s. Naturally-occurring and human-induced arsenic pollution in drinking water has since been discovered in many parts of the world such as Argentina, Bangladesh, Chile, Taiwan, Hungary, India (West Bengal), Mexico, and the USA. It is now recognized that dealing with arsenic contamination in groundwater is a problem of global dimensions.

It is important to understand the suffering of the large population impacted by arsenic poisoning through drinking contaminated water. Long-term exposure to arsenic in drinking-water causes increased risks of cancer in the skin, lungs, bladder and kidney. It also leads to other skin-related problems such hyperkeratosis and changes in pigmentation. A large number of patients with visible or measurable health impacts are anticipated – although precise estimates for South Asia have not even been developed as yet. It is important to note that it takes several years of drinking arsenic-contaminated water to develop visible symptoms – although they may appear earlier in some patients. This makes estimation of the future number of arsenicosis patients quite difficult. At the moment, no reliable cure for these arsenicosis patients is available. At a minimum, ceasing the consumption of arsenic-contaminated water and improving nutritional health are shown to assist in recovering from early stages of arsenicosis. Therefore, provision of clean, safe water to all becomes an essential requirement.

In order to fully understand the arsenic crisis and to adequately respond to it, a number of gaps in the scientific knowledge must be filled. Importantly,
information from scientific research should be directly fed into the development of strategies to cope with the arsenic crisis. UNU has undertaken such research work focused on better understanding the scientific problems. UNU is also engaged in conducting policy-relevant research and facilitating the dialogue on the mitigation of the arsenic crisis.

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Gender Inequality and Poverty in Africa

African women, particularly those in rural areas, are the main custodians of indigenous knowledge in natural resource conservation, management and food preparation. Studies in traditional food and agricultural systems have shown that women have developed effective methods of sustaining such practices as intercropping, that enhance the productivity of soils and crops. Through experimentation with wild species, the African women have discovered a diversity of wild resources for food. Subsequently, they have domesticated some of these plants and have accumulated and packaged information on their uses and preservation. Over the years, such information has not only been passed from one generation to the other but also has been shared and exchanged with other groups.

African women, since the 1985 Nairobi Conference marking the UN Decade for Women, have been linked to activities that promote sustainable development. However, they still form the bulk of the poor in Africa and continue to face problems in almost all sectoral development activities dealing with natural resources management (production, processing, manufacturing industries, marketing or sales and utilization, etc). These problems arise because of inequalities that put women at a disadvantage in education and training, employment, access to financial and other resources, access to innovative or appropriate technologies, access to loans, collateral and other measures to reduce poverty, adherence to unfavourable cultural and traditional practices, customs, and adherence to male-generated policies that do not create a level playing field and an enabling environment for women entrepreneurs.

UNU believes that changes in these conditions will lay the foundation for sustainable development. To foster these changes, studies must highlight policies and interventions that minimize gender inequalities and emphasize the critical role played by African women in the conservation and management of natural resources. In furtherance of this objective, UNU has:

Urbanization

Of the two billion people that will be added to the world’s population over the next thirty years, approximately 99.5 percent will be located in urban centres. This
translates into the addition of approximately 190,000 people daily to cities around the world. Yet the urbanisation of the world will not take place evenly as most of this population growth will take place in cities of the developing world. That is, for every five to six people added to cities in the developed world, one hundred will be added to cities in the developing world. Within the developing world there will also be extreme variation. Of total urban growth, approximately 61 percent, or almost 1.3 billion, will be added to Asian cities. If new cities were built to accommodate all these people, this would mean that 130 new megacities would need to be created within the Asian region.

A comparison between cities in Asia and Africa highlights the need for diverse responses to urban growth that are based on local, national, and international conditions. It is becoming increasingly clear in the twenty-first century, for example, that urbanisation is a driving force in terms of environmental change and that cities are the new engines of global economic growth. This is nowhere more so the case than in the Asian context and in parts of South America where cities are increasingly being considered as lynchpins in the search for regional environmental if not ‘earth security.’ Yet, in other regions of the world such as sub-Saharan Africa, massive urbanisation is taking place but without the high economic growth that is associated with Asian urbanisation. Furthermore, many of the cities in other parts of the African sub-continent have remained largely marginalised.

Recent UNU studies have indicated that rapid development processes that have occurred under the influence of globalisation flows have followed a dramatically different path to those development processes that have been overlooked by globalisation. In Asia, transnational economic flows have been encouraged by national and local decision making that privileges growth over environmental concerns. This has left many cities within the Asian region in a condition of environmental stress. While many nations and cities have, since the 1997–98 financial crisis, demonstrated an increasing interest in sustainable urban development, most public decision makers remain uncertain as to the type and nature of policies to implement in order to improve their environments. This is partly because environmental conditions vary tremendously among cities and across the region due to a variety of factors including differences in income, health, basic infrastructure, housing stock, and culture. At the same time, variations between environmental conditions within cities also seem to be on the increase. This said, the positive impact of recent efforts to reduce environmental degradation within these cities is becoming increasingly evident in some areas.

In many African cities that have remained largely isolated from the impacts of economic globalisation, the situation is very different. Rapid urbanisation has left many cities in a state of crisis because they lack sufficient economic vitality to employ vast numbers of migrants. As a consequence, entirely new cities have sprung up almost overnight with no water supply or sanitation and sewerage systems. What is more, many of the cities in Africa risk becoming even more
disconnected from the global economic system because of the increasing digital divide.

There is still a crucial need for more in-depth research concerning the relationships between increasing wealth because of globalisation-driven growth and demographic shifts, and environmental conditions in cities and the well-being of urban populations. As most data is collected at the national level, there is only a limited body of regional knowledge relating to the environmental conditions of most cities. This remains the case despite the recognition that cities play such a crucial environmental and economic role. It is vital, therefore, that more information be collected and assessed in order to further our understanding of the relationships between the driving forces of change, their impacts, the state of the urban environment, and current policy responses. The first step in understanding these complex inter-relationships is an urban assessment.

Urban ecosystem assessments, or the urban ecosystem approach, must become part of urban action plans to promote the understanding of these linkages. The key to urban ecosystem approach is the connection between driving forces (i.e., demographic shifts), pressures (i.e., wealth and poverty), states of the environment (including the health of populations), and responses (policies) related to urban activities that focus on the ability of cities to provide the environmental/ecological services needed for human well-being. As many cities throughout the developing world have not performed environmental assessments, notwithstanding integrated efforts, urban managers are at a loss for responding to pressing environmental conditions. Urban ecosystem assessments have the promise of facilitating integrated and multi-scaled policy analyses and therefore would be vital to decision-makers at all levels.²

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Protecting and Managing the Natural Resource Base of Economic and Social Development

At the core of UNU’s activities on sustainable development is the use, and operationalization of integrated approaches. At the very essence of such approaches is the understanding of the link between natural ecosystems and the goods and services they provide for human development and well-being. This is

² In collaboration with a number of scholars and UN agencies (WHO and UNESCO/MAB) and other international organisations (International Institute for Environment and Development), the UNU/IAS is leading an effort to conceptualise and promote urban ecosystem assessments as part of the Millennium Ecosystem Assessment. The assessments are envisioned to operate in ways commensurate with Local Agenda 21, as multi-stakeholder dialogues and public participation will be important components.
an imperative that is behind much of the work that UNU has been doing on fragile ecosystems such as arid and semi arid ecosystems, mangroves, mountains, and also in the area of agrobiodiversity.

The UNU has also recognized that the present state of knowledge, from an integrated perspective of the Earth’s ecosystem, and its potential to provide continued service to humankind is weak. Therefore, it is lending support to the Millennium Ecosystem Assessment (MA), which is a major global scientific assessment that will contribute significantly to the development of a more complete understanding of the link between biodiversity and other environmental issues such as wetlands, desertification, and climate change. This assessment will also provide a more comprehensive account of the capacity of various regional, sub–regional, and sub–national ecosystems to provide the goods and services that are essential to the well–being and development of the peoples of the world.

**Combating Desertification and Drought**

The UN estimates that some 70 percent of the 5.2 billion hectares of drylands used for agriculture around the world are already degraded. This impacts approximately 250 million people across the world, although some estimates suggest a figure that is four times higher than this. As an example, the worldwide area of arable land per person has been reduced by as much as 25 percent during the last quarter of the twentieth century. This has serious implications for food security and the livelihoods of people who are dependent on the degraded lands. The impact of land degradation on ecosystems is also readily apparent in the destruction of biodiversity resources. According to UNEP estimates, about 65 million hectares of forest were lost across the globe during just five years (between 1990 and 1995). The resultant loss in biodiversity at genetic, species and community level is also severe.

Development of integrated approaches for water and land management in drylands is critical to minimizing adverse societal and economic impacts. This calls for actions to build and strengthen existing institutional capacities for regional, national and basin-level agencies to effectively address and integrate cross-sectoral aspects. These integrated approaches should be adopted to local and regional requirements, rather than using them as ready-made solutions. A general framework for such integrated approaches must address the following closely interlinked dimensions:

- **Scientific Dimension:** Innovative solutions have to be identified for managing land degradation, mainly through water use efficiency and productivity, and soil conservation. Re-use and recycling of water for agricultural and other uses is becoming increasingly attractive.
Human Dimension: Impacts of integrated water management on livelihood of local people need to be accounted for when designing and discussing resource management approaches. This, in turn, requires active involvement of local communities in development and implementation of such strategies. It is also important to account for the effects of indigenous practices on water resources, both positive and negative.

Economic Dimension: There is a need for evaluation of social, environmental and economic costs and benefits to ensure long-term viability of integrated approaches. At the same time, capital investment into developing new infrastructure as well as maintaining existing and traditional practices is essential.

Natural Resource Dimension: Rehabilitation of ecosystems in marginal lands should have the highest priority in integrated programmes, primarily through in situ conservation approaches. Due consideration must be given to trans-ecozone characteristics of resources – especially water. Planning and conflict resolution on a trans-ecozone level become crucial in approaches to improve the water resources distribution in drylands.

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*Conservation and Sustainable Use of Biodiversity*

Conservation and the sustainable use of biodiversity is a key goal that has been stressed on a number of occasions in the preparations for this year’s world summit and in major environmental treaties such as the Convention on Biological Diversity. The UNU has been working on the issue of biodiversity from the point of view conservation of agricultural crops and integrated land management. Biodiversity exists largely in landscapes that are managed for agriculture and rural livelihoods. Through generations of innovation and experimentation, farmers have nurtured a diversity of plants and animals, either wild or domesticated, and accumulated a vast amount of knowledge concerning the management of biodiversity. New commercial and intensified farming methods are, however, beginning to contribute substantially to biodiversity loss. In the face of these increasing pressures, it is crucial that the indigenous knowledge that has been gained through the process of learning, experimentation, and innovation in farming and land management throughout the developing world is not lost. Indigenous knowledge of the management of fragile environments, the local genotypes of food crops and traditional farming practices has the potential to teach us many lessons on how to preserve diversity and halt environmental degradation. At present, an insufficient amount of research has been aimed at capturing the potential embedded within these indigenous knowledge systems.

Generations of farmers have experimented and developed innovated ways to manage biodiversity. In the process they have devised management practices
that combine superior production along with the enhancement of biodiversity. One useful approach to the preservation of biodiversity within Asia is to promote best practice farm management by identifying "expert" farmers and facilitating their training of other farmers, technicians, scientists, extension agents, and policymakers. This represents a bottom–up approach to technology and knowledge transfer that is dramatically different from the top–down approach that is often used in agricultural extension and reforestation programmes.

The most promising method of improving livelihoods by encouraging the maintenance of agrobiodiversity, relies heavily on hybrid management systems that take the insights offered by locally developed knowledge, expertise, and practice and integrates them with the most modern techniques. This strategy creates entirely new management systems that are both distinct and well adapted to local resource use patterns.

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Mountains

Mountains are the home to 600 million people and the source of water for more than half the world's population. Degradation of these fragile ecosystems threatens to seriously worsen national and transnational environmental problems including floods, landslides and famine. Climate change, pollution, armed conflict, population growth, deforestation and exploitative agricultural, mining and tourism practices are among a growing list of problems confronting these “water towers of the world.”

Mountain issues remain relatively isolated from the greater national and international political agenda. However, the designation of 2002, coinciding with the year of the Johannesburg Summit, as the International Year of the Mountains (IYM 2002) will work toward ensuring the well being of mountain and lowland communities by promoting the conservation and sustainable development of mountain regions. The UN Food and Agriculture Organisation, the lead agency for IYM, is working closely with the United Nations University and other organizations to ensure that the broadest possible range of expertise is focused on reaching the goals of sustainable mountain development. Much of UNU's work on mountain issues has been in the form of awareness raising through conferences, reports and a yearly calendar distributed globally depicting mountain ecosystems. The UNU has also been conducting research on mountain issues and many of the findings have been instrumental in challenging conventional thought on mountain issues such as the cause of environmental degradation, flooding and the role of mountain people in conserving their own environment.
Regional dissimilarities make it impossible to propose generalized approaches to mountain-related issues, however, there are several issues that require urgent attention. The widespread conflict in mountain regions, including conventional warfare, terrorism, guerrilla insurgency and repression of minority peoples, must be tackled far more vigorously. The management and utilization of the natural resources of mountains, especially water, must be undertaken in such way that mountain people share in the benefits.

Information and data collection are needed before effective policy formulation can occur. While several of the world's mountain areas are in relatively good ecological shape, many face accelerating environmental and cultural decline brought on in part by government and multilateral agency policies too often founded on inadequate research. One of the problems here is that the opinions and experiences of mountain people need to be combined with scientific knowledge before a better understanding of mountain processes can be obtained. Cultural diversity, which is a prevailing feature of mountain life, must be considered as complementary to biodiversity if sustainable mountain development is to be achieved. What data policy makers do rely on often relates to mountain ranges in the developed world, inappropriately applied to developing countries. Notions based on scant scientific data are often accepted as truths. For example, while there are serious problems in the Himalayas, massive deforestation has not occurred across the entire mountain system. Such misinformed assumptions have led to simplistic, and often counter-productive, remedies.

In addition to gathering and sharing more and better data and information worldwide, there is an urgent need to strengthen capacity in developing country mountain regions, such as in meteorology, hydrology, ecology and soil sciences. These also must be firmly linked as well to the human sciences - anthropology, social science and human geography. The management of mountain regions and watersheds in a way that embraces and integrates many sciences will be a key to success. Also important is the promotion of alternative livelihood opportunities for mountain people in developing countries. This should help to alleviate poverty at the root of so many of their health and environmental problems.

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Deforestation

Over the last decade of the twentieth century, rapid deforestation has taken its toll with some fifteen million hectares of forests lost annually, mostly from the tropics. It is also clear that the structural integrity of much of the forest cover that remains has deteriorated. The facts are startling. Forests have virtually disappeared in twenty–five countries; eighteen have lost more than ninety–five percent of their forests and another eleven have lost ninety percent. The highest current estimate of the world’s remaining forested areas is about 3.6 billion
hectares from an originally forested area of more than 6.0 billion hectares. Primary forests have undergone the greatest transition. About fourteen million hectares of tropical forests have been lost each year since 1980 as a result of changes in land–use from forest to agriculture. Forest decline threatens the genetic diversity of the world’s plants and animals. The decline of forests is relentless and could change the very character of the planet, and of human enterprise, within only a few years.

An effective approach to the problem of deforestation is based on an intrinsic understanding of the true nature of the value of forests. As people often do not realise the multiple uses of forests, its proper utilisation is often overlooked. A greater level of coordinated and integrated scientific research on the multiple different values of forests is needed among the international academic community. There is also a need to strengthen capacity development in order to inform foresters, researchers, policymakers, local communities and other actors of the true value of forests and to stress the important role of forest–based communities in supporting sustainable forest management.

Worldwide awareness building and a concerted effort for improving forest policy management are needed to promote the adoption of an “International Year of Forests” by the United Nations in the near future.3

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Oceans, All Kinds of Seas, Including Enclosed and Semi–Enclosed Seas and Coastal Areas

The coastal areas of East Asia are a critical and high–priority ecosystem. Agriculture, manufacturing industries, and urban areas are all major contributors to the pollution observed in East Asian coastal waters. The level of pollution in these areas can be approximately correlated to the level of industrialisation in the countries adjacent to the coastal areas. This means that the most highly industrialised countries tend to have the worst pollution in their coastal waters. In addition, the concentration of certain toxic pollutants, such as DDT, appears to be on the rise in East Asian coastal waters despite a ban on their commercial use. The influx of fertilisers, pesticides and herbicides has also increased in the recent years. Various parts of the coastal ecosystems have been seriously

impacted by toxic pollutants that have land–based sources. The negative impacts on shellfish (such as mussels), mammals (such as dolphins), and mangrove forests are pronounced and have been well documented.

Furthermore, the previously widespread mangrove ecosystems in the Asia–Pacific region have been decimated in recent years as a direct result of human pressures including, shrimp farming, urban development, and tourism, etc. The loss of biological diversity as a result of this damage to the mangrove systems is severe. It is crucial from an economic development perspective, however, that any attempts to remedy current environmental problems take full account of the potential social–economic impacts that these remedies may have on those groups whose livelihoods depend upon coastal natural resources.

It is essential that some quantifiable indicators for evaluating mangrove ecosystems be developed. These indicators must incorporate socio–economic factors and could, usefully, be based on an assessment of goods and services provided at an ecosystem level. An in–depth evaluation of the impacts of the introduction of foreign species of mangrove plants into coastal habitats is also urgently needed. This is closely linked to biotechnology issues pertaining to the exploitation and modification of the living resources in mangrove ecosystems. Emphasis should be given to the evaluation of various novel uses of mangroves plants, including for medicinal purposes and as a food source.

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Conservation, Protection and Rehabilitation of Coastal Communities and Ecosystems

Human society and coastal ecosystems are very closely interlinked and interdependent. Vast majorities of the population live in coastal areas, and depend on marine and coastal resources for food, employment and income. Focused assessments made by United Nations University (UNU) indicate that this human dependence on the life-sustaining coastal resources is under threat from a range of destabilizing effects associated with human activities, including different forms of pollution and over exploitation. Coastal communities need to respond to these issues with informed management of coastal areas, and to share the lessons that they have learned in rising to this challenge.

A number of key strategies must be following to ensure protection and conservation of coastal ecosystems; these include:

- Involvement of communities in design and implementation of coastal management approaches; particular emphasis should be on introducing supplementary – rather than alternative – livelihood options.
- Raising the awareness of various stakeholders is crucial, and popular media and NGOs can play an important role in this.
There should be systematic and sustained effort to map threats to coastal ecosystems; this will greatly help in prioritizing action and focusing limited financial and human resources.

It is essential to develop regional and international policy frameworks that help ameliorate some of the transboundary and regional impacts on coastal ecosystems. In order to undertake these approaches, human and institutional capacity development in poor coastal communities is absolutely critical.

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_African Natural Resources_

Africa is richly endowed with diverse natural resources and its forests host the largest proportion of the world's reservoir of genetic materials. For example, Africa's tropical forests harbour over 8,000 species of higher plants, a figure only rivaled by the Mediterranean vegetation zone of South Africa. Africa's mineral wealth is legendary as the continent is one of the world's major sources of gold, diamonds, copper, tin, bauxite, manganese, uranium and crude oil. This enormous wealth in natural resources should provide potential opportunities for addressing the multifaceted challenges facing the continent. However, past modes of exploitation and management of the natural resources have engendered some problems. In many instances, the exploitation of Africa's mineral wealth has fostered and fueled war and deprivation; situations that compound the already dire situation of the poor rural population.

Another concern is that the natural resources (food crops, useful plants, animal and land) that form the mainstay of the livelihoods of most Africans and are being rapidly degraded. This degradation manifests itself in many ways, most noticeably in deforestation, in the loss of productive capacity of soils used for agriculture and pasture, in serious distortions in the hydrological balance and the access to water resources, and in the continuing loss of plant genetic resources.

The challenge is to ensure that Africa's natural resources serve as the basis for economic growth that would result in more active and sustainable participation in the global economy. Also crucial is to reverse the degradation of the natural resources. Consistent efforts must be made in the short to medium term to build up the resources to levels never before attained in order to meet the demands of a population growing at more than 3 percent a year.

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Impact of Natural Disasters

It is in cities, with their large collection of human habitation, where disasters can cause the greatest damage. Death tolls from recent urban earthquakes have been large. The 1996 Tangshan Earthquake in China reportedly killed 250,000 people, the 1990 earthquake in Tabas, Iran, killed 40,000, and the 1991 earthquake in Spitak, Armenia, killed 20,000. Earthquakes are not the only deadly natural phenomena. In 1992, Hurricane Andrew brushed Miami and caused US $22 billion in damages in the area. While the problem of disasters is a concern for both developed and developing countries, the impacts of disasters are much greater in the developing world. In areas such as Mexico City, Manila, Lagos and Accra, development has caused cities to grow in ways which exacerbate disasters because it forces more and more people to live in hazardous or disaster prone areas.

Although there are also mitigating aspects of living in a city that increase the chance of surviving disasters, these positive aspects such as the existence of facilities and the abundance of supplies, are usually countered by other negative factors. These include over-crowding, poor infrastructure, and the existence of more human-made hazards, such as dangerous materials and chemicals.

While these types of shortcomings are offset in developed countries through intensive planning, recent earthquake disasters in California and Kobe have demonstrated that these extensive mitigation measures are not enough. In many of these cases, the mitigation measures that were put in place fell short on one critical characteristic; the treatment of the social aspects of a disaster. Research has shown that city vulnerability is equal to human vulnerability. Yet, most disaster planning currently focuses on the physical aspects of disasters, the weakness of buildings and structures, while focusing very little attention on the people who actually use and occupy the structures, i.e., the people.

The key role that disaster management plays in the effective implementation of Agenda 21 has been stressed on numerous occasions in preparation for the Johannesburg Summit. Natural disasters divert much-needed resources from other purposes, thus hampering an already difficult development process, especially in the poorest countries. The recently concluded International Decade for Natural Disaster Reduction has shown that it will not be easy to deal with such phenomenon.

In order to more effectively prepare for disasters it is important to consider the social aspects of vulnerability, effectively dealing with the people that will be affected by disasters. Linked with the other aspects of sustainable development, this will include the upgrading of the well-being of people before disasters, social support systems, partnership and networking, awareness and education, eradication of social and cultural stigma and racism, as well as prodding of political will and corruption reduction. Although somewhat distant to the usual
approach to disaster management, it is nevertheless obvious that these are the root causes of vulnerability, which not only affect resistance to disasters impact, but also influence the capability of communities to rebound and reconstruct.

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**Unsustainable Consumption and Production Patterns**

As pointed out in the Secretary-General’s Report “Implementing Agenda 21” a key to achieving sustainability is a “fundamental change in the industrial societies produce and consume.” Most of us are familiar with statistics of over consumption and overproduction, that 15 % of the world’s population, in high-income countries, accounts for 56% of the world’s total consumption, while the poorest 40%, in low-income countries, account for only 11% of consumption. The question is how to work in practical and effective ways to improve these unsustainable patterns? In this section of the report the UNU offers two practical means that industry and the United Nations itself can work to achieving greater eco-efficiency.

**Industrial Waste and Eco-efficiency**

At the industrial level the UNU has been tackling the question of eco-efficiency through a programme called ZERO Emissions that seeks to reduce waste and improve the productivity of resources by enhancing symbiotic linkages between industries. The ZERO Emissions strategy is achieved by identifying value–added uses for process emissions as raw–material inputs for other processes. The ZERO Emissions concept is a practical method to achieve greater environmental sustainability. This approach has proved to be especially effective in Japan, where many firms have used it successfully to reduce industrial waste while maintaining profitability. Zero Emissions has excellent potential for a broader application. Such strategies could be implemented by reorganising industries into clusters such that each industry’s wastes or by–products are fully matched with the input requirements of another industry, and the integrated whole produces no waste of any kind. National governments could, with the cooperation of industry, sponsor feasibility studies to determine what sectors could most benefit from the application of Zero Emissions. In some cases, national investment in research and development will be needed to get past the initial non–market barrier that exists for all new technologies. As Zero Emissions symbiosis requires new cooperation between companies, local governments can play an important brokering role between firms, as well as stimulate development of Zero Emissions industrial parks.

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4 See http://www.unu.edu/zef/ and http://www.ias.unu.edu/special/zeri.cfm
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**Greening of the UN System**

Under the Global Compact launched by the UN Secretary–General Kofi Annan in January 1999, a new relationship between the UN and the world’s business leaders is emerging. This relationship could help build the social and environmental pillars that are required to sustain the new global economy and make globalisation work for all the world's people. Within this framework, the Global Reporting Initiative has been established as a multi–stakeholder effort to create a common framework for voluntary reporting on economic, social and environmental aspects of corporate activities. Related to this, as of December 2001, around 36,000 businesses around the globe, including a large and growing number in developing countries, have obtained certification under ISO14001 and the European Eco–Management and Audit Scheme.

While ensuring the move towards the creation of sustainable business practices, it is also important that the UN system as a whole promotes green practices within its own operations. The UN spends US $3 billion every year on the procurement of goods and services (about thirty percent of the UN's total budget) and operates facilities across the globe. It is also a convener of major international conferences and activities in different countries that require considerable travel for UN personnel.

A number of UN agencies take their environmental responsibilities very seriously. UNHCR, for example, has developed and implemented a green procurement system⁵; UNDP has implemented the Green Office Initiative, and UNU obtained ISO14001 certification in January 2001.

In line with the requirements of the Global Compact, there may considerable merit in making greater efforts to ensure that the UN system has its own house in order by promoting the greening of the UN through the establishment of an effective environmental management system. Related to this, the UN should take measures to ensure that the major conferences, including WSSD, are implemented in a manner that is friendly to the environment and involves minimum waste. The UN organisation could also increase its use of information and communication technologies, including video–conferencing, in an effort to reduce staff travel and its associated environmental impacts.

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Globalisation and Sustainable Development

Globalisation has an impact on the environment and sustainable development in a wide variety of ways and through a multitude of channels. The core challenge in this regard relates to the question of how the positive aspects of economic globalisation can be more directly focused toward those who need it the most. There are several possible solutions to this question, all of which need to be more fully researched and considered. Most of these solutions relate to the structure and functioning of the current global governance system. Some have suggested that current difficulties stem from the fragmentation of environmental and economic international institutions. Others suggest that environmental institutions are weak and have no teeth when compared to global economic institutions. Still more have suggested that there are no institutions in place that can gain control of the rapid forces of globalisation or its tendency to move power, capital, and technology in ways that serve only to make the rich richer, while leaving the poorest out on the margins.

If we are to truly realise the concept of sustainable development then we should work towards making better use of the positive connections between globalisation and sustainable development. One very practical area where this positive connection could be demonstrated is the Trade and Environment debate.

Trade and Environment

The trade and environment debate has continually raised speculation and created a climate of uncertainty in regard to the potential incompatibilities between international trade and the goal of sustainable development. The underlying cause of this debate is the concern of developing countries that the linking of environmental and trade issues within the context of the WTO would lead to an increase in the number of environment-related trade restrictions that would limit their access to global markets. Any future environmental or trade negotiations must be aimed at ensuring that this concern is not realised.

The Doha WTO Ministerial Declaration reaffirms the need to place developing countries at the heart of the future round of trade talks and also stresses its commitment to the objective of sustainable development. These two guiding imperatives must form the basis to finally resolve the ensuing international debate on the multilateral trading system and legitimate environmental concerns.

In this context the work programme on trade and environment of the WTO that, according the Doha Ministerial Declaration, will be proposed for the Fifth Session of the WTO Ministerial Conference and be considered for the “desirability of future action” should include the following key issues:

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• Consistent interpretation and application of the precautionary principle, and other recognized principles under international environmental legal instruments in WTO dispute settlement proceedings.

• Perverse subsidies are both harmful to the economy and to the environment. In a number of sectors (such as fish and fish products, and agriculture) they restrict imports from developing countries. In such cases, removing perverse subsidies is considered to be a “win–win” scenario where the environment could be improved and the exports of developing countries and least developing countries could be expanded.

• Multilateral environmental agreement rules that have trade implications and which enjoy “universality” must be recognised as having supremacy and authority over conflicting trade rules. Such cases must be recognised as legitimate exceptions under the WTO and regional trading agreements. Member states of multilateral environmental agreements and the WTO and other economic legal instruments should conclude mutually recognised guidelines of how possible legal inconsistencies could be interpreted between their respective agreements.

• Other UN agencies and international organisations must join forces to provide greater capacity development and technical assistance to create awareness and expertise to ensure that trade and environment can be mutually supportive. UNU, as the premier research and training institution within the UN system, could play and strong role in this regard.

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**Health**

On the health issue there is both good news and bad news since the Earth Summit. The good news is that with the exception of HIV/AIDS, significant progress has been made on health issues in the last ten years. As a consequence, average life expectancy has risen at a much sharper rate than in previous periods. For example during the 1990s, China, India, and Indonesia added two to four years to their average life expectancy. Chinese life expectancy increased from 68.8 in 1990 to 70.1 in 1999, Indian and Indonesian life expectancy increased from 59.8 and 61.7 in 1990 to 63.2 and 65.7 in 1999 respectively.

The bad news is that there is tremendous amount of work that must be done on environment-related diseases. Poor environments such as contaminated water, sanitation, severe indoor air pollution, are at the root of many the health problems such respiratory and cardiovascular problems, vector borne diseases such as
malaria and infectious diseases such as the spread of HIV/AIDS. The UNU has been working in several areas including on health in cities, water and health, and food and nutrition.

*Health and Cities* *(Working on this section)*

*Water, Environment and Health*

At the Rio+5 Special General Assembly Session in 1997, UN member states called "for the highest priority to be given to freshwater problems facing many regions, especially in the developing world." Such water problems contribute to a growing toll of human life each year, including the deaths of 2.9 million children. By U.N. estimates, two thirds of humanity will face shortages of clean freshwater by the year 2025.

In effort to address this need and to work on water issues from the standpoint of human health, the UNU created a global network on Water, Environment and Health (INWEH). The Network is addressing water issues in developing countries with an emphasis on ecosystem approaches to water and watershed management. One of the main interests of the network is to foster the application of appropriate technologies to meet water needs and assist environmental industries in developing countries to ensure the ongoing availability of affordable products and services.

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*Food and Nutrition* *(I’m working on this section awaiting something from our FNP)*

According to the World Health Organization (WHO) nearly 30% of the world’s population suffer from one or more or the multiple forms of malnutrition, and almost 50% of the 10 million deaths among children under the age of 5 in developing countries are malnourished. But what is the link with sustainable development and why I this a concern for the WSSD deliberations?

The UNU Food and Nutrition Programme (FNP) has been assists developing countries to enhance institutional and individual capacity in food security and nutrition for over 25 years. Recent activities have been focused in Africa where the need is the greatest. As part of the African Capacity Development Initiative, the programme has been building competence and leadership on food and nutrition issues. The idea behind this work is to drive nutrition agendas at the
national level and to mobilize regional and inter-regional cooperation to eradicate malnutrition as a public health concern.

The FNP is working with the WHO to develop new growth references for infants and young children. The new reference will bring major technical improvements and, most importantly, also serve as a tool for advocacy in support of children’s health. Other areas that the UNU is working on is the Global Cereal Fortification Initiative and the Iron Deficiency Anemia Programme Advisory Service. This activities are carried out in collaboration with Asian Development Bank and the UNICEF and other organizations.

**Means of Implementation**

The implementation of Agenda 21 is a multidimensional and complex task that requires tough commitments by national governments and more generosity by the industrialized international community. To some extent since the UNCED there has been a greater recognition of the importance of mobilizing adequate financial resources to achieve the ambitious poverty reduction goals of the UN Millennium Declaration and to invest in the sustainable development of the developing world. There is also growing global concern over the increasing polarization between the haves and the have-nots in the world. There is now a more concerted effort to identify and develop resource mobilization strategies for the developing world as was demonstrated at the Monterrey Financing for Development Conference. Turning awareness and improved understanding into a deeper financial commitment will, however, remain as the greatest single challenge for achieving sustainable development.

Making science and technology work for sustainable development and creating a global learning space for sustainable development at all levels of education, from primary school to university is also an extraordinary challenge. In this regard the call made for a new contract between the science and technology community and society is a timely and a significant one and must be transformed into action.

**Finance**

In recent years, discussions relating to the challenge of providing adequate financing for sustainable development have become mechanical and predictable. The issue of financing sustainable development has also become incorrectly framed as a case of charity to be disbursed from the wealthier industrialised world to the poorer developing world. What is required is a fundamental reassessment of the way the international community currently views the relationship between financing and sustainable development.

The key to a possible solution may lie in the development of a more integrated policy approach that builds on the inherent inter-linkages that exist between
different environmental concerns and takes advantage of the improved coordination among policy mechanisms.

There is evidence that the GEF’s position at the centre of more than one MEA has helped it to avoid funding projects in one focal area that could have undermined the objectives of another focal area. For example, its climate change portfolio has not included sequestration projects, which have been criticised as carrying the risk of promoting forestation projects with an emphasis on monoculture, rather than species diversity. Projects that hold the potential to interact with more than one focal area are grouped in a multifocal programme area of its own, which promotes investments consciously designed to be complementary across MEA objectives.

If greater synergy and coordination of multilateral environmental policy concerns can be achieved, it may be possible to balance potentially competing international agendas for environmental protection law, policy, and institutions (e.g. trade/investment and environment).

Regardless of amount, increasing the level of financial resources, without linking it to other types of institutional reforms, is not going to “solve” the global environmental dilemma. However, if properly enacted and nurtured with adequate institutional support, innovative financing schemes may help leverage funds toward addressing a wide range of sustainable development objectives.

Science and Technology

Science and technology policies are crucial to the achievement of sustainable development. The reason for this is that most if not all of the environmental problems facing the world ultimately derive from the long-run processes of technological change that began with the first industrial revolution. The distinctive feature of modern economic evolution has been persistent innovation. While this has had spectacular effects on the performance of technologies and on human welfare, the benefits have been unevenly distributed, and have been at the cost of significant environmental effects. The benefits and environmental costs are in fact related, since market economies provide considerable incentives to innovation, yet are characterized both by imperfect appropriability of innovation benefits, and by imperfectly assigned costs. So market systems encompass both positive and negative technological externalities, on a very large scale. Environmental problems, broadly speaking, derive from these negative technological effects, and will require further innovation if they are to be controlled or removed. But such innovation will be far from simple to achieve. So the UNU view is that continued innovation is central to the solution of environmental problems. Such innovation can be small-scale and incremental, but some changes must be radical in character.
Some of the damaging externalities of existing technologies are dealt with over time by the economic process. Where resources become exhausted, rising input costs can generate substitution processes, and more general incentives to cost reduction can have powerful effects on types and levels of inputs, and on accompanying pollution problems. At the same time, there are many changes that can be made via regulatory instruments, to palliate or remove environmental damage. However, we should recognize that there are many environmental problems that are unlikely to be significantly affected by economic factors or regulatory action. This is particularly the case where innovation has been characterized by long-run cumulative development – that is, by building on past developments, with development occurring along a trajectory that builds on existing techniques. It is this cumulativeness that underlies “lock-in” – the inability to move away from technologies that are in some sense less adequate than alternatives. This is a particular problem in environmental technologies, since many of major environmental problems spring from long-standing patterns of energy use, or long-standing patterns of pollution effects, that are intrinsic to the technologies that are dominant in the market and in use. In such cases any change from the existing technology needs to be highly innovative and usually large-scale. Where such changes are needed public policies have a vital role to play in

- Developing technological alternatives
- Nurturing new patterns of production and use of technologies
- Helping to diffuse environment-friendly technologies
- Devising appropriate systems of regulation and governance
- Creating technological collaboration between countries, in particular North-South co-operation on environmentally-friendly technologies

Because science and technology policies are so central to the repair of environmental degradation, and to the achievement of sustainability, the development of science and technology capabilities with respect to the environment should be a central objective of governments worldwide. But governments acting alone cannot achieve globally relevant outcomes: a new pattern of transnational research and innovation collaboration is needed if our industrial economies are to achieve a sustainable technological basis.

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**Higher Education and Sustainable Development**

The advances in science and technology offer so much for the greater good of society at large, but it still must be harnessed and mainstreamed into sustainable development. The global academic and scientific communities have been examining how new social contract could be developed that achieved this very goal. The idea behind this initiative is to increase the percentage of research and
development that is carried out on areas of sustainable development. This would eventually enable societies to devote the right kinds of resources to ameliorating social, economic and environmental sectors.

A new social contract such as is envisioned by the global scientific community, however, could only materialize with basic commitments from key sectors such as business, industry and government. At the most fundamental level it will require a strong push towards bringing sustainable development into education at all levels, from primary to higher education.

The Lüneburg Declaration on Higher Education for Sustainable Development⁷ of 10 October 2001 recognized the indispensable role that higher education plays in addressing the critical challenges of sustainable development. The Declaration recommends that governments, higher education institutions, non-governmental organisations and other stakeholders, and the various UN agencies and bodies involved in training and capacity building activities must become part of the kind of this new social contract on science and technology. In particular it calls on the WSSD to include education in general and specifically higher education in its future programme of action. The Declaration also calls on the UNU to support and these efforts and for global university associations to creating a global learning environment for sustainable development.

The UNU is well situated as both the think of the UN systems and as an international academic organization to work towards promoting and realizing the challenges of the Lüneburg Declaration. One area that the UNU can have a strong impact is on higher education. Through working with university professors, educators and advance trainers, the UNU can assist higher education institutions to develop sustainable development modules into their curriculum.

It is in this context the Institute of Advanced Studies of the UNU (UNU/IAS) will launch a type two partnership at WSSD on Education, Science and Sustainability. The UNU/IAS fellowships will be for educators to participate in workshops and on curriculum development for creating university courses in the area of sustainable development. It is thought that this “training the trainers” method will spur more sustainable development course and direct science more towards the application of sustainable development at a grass roots level.

Information and Communication Technologies

While Agenda 21 acknowledges the importance of information and communication technologies, there was no way that delegates at the Rio

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⁷ The Lüneburg Declaration on Higher Education for Sustainable Development was adopted on 10 October 2001 in Lüneburg, Germany, on the occasion of the International COPERNICUS Conference “Higher Education for Sustainability: Towards the World Summit on Sustainable Development (RIO+10)” held at the University of Lüneburg from 8–10 October 2001.
conference could have anticipated the vast implications of the information revolution that so dramatically shaped the last decade. Indeed, it is now widely recognized that information and communication technologies are “changing the ground rules for information flow in society.” The Internet and computer-mediated information systems shift the balance of control from information suppliers to consumers. Moreover, the pool of electronic information worldwide is growing exponentially.

In recognizing the role that information and communication technologies could play, and to some extent are already playing, within the sustainable development challenge it is crucial that the benefits of these technologies are made available to all. It was in this context and in response to the resolutions made at the Millennium Summit in September 2000, that the UN Secretary-General formed an advisory group of twenty-one experts from the private and public sectors to help bridge the digital divide by harnessing the potential of these technologies for human development. While this represents a significant step in the right direction, much research is still needed in order to identify how information and communication technologies can best be used to further the purposes of sustainable development and, particularly, how they can best be utilised to the advantage of the developing world.

The rapid diffusion of information and communication technologies has resulted in the opening up of new avenues for the preparation and presentation of environmental information in formats that can be more easily understood by decision makers and the general public. Multimedia technologies, software packages, and such tools as indicators and animated graphical presentations, can assist decision-makers in understanding environmental change. Utilisation of the World Wide Web and other computer networks can facilitate rapid information exchange and communication essential to the pursuit of sustainable development goals. Sophisticated global, national and local environmental monitoring systems can be linked and accessed real–time to ensure feedback on the implementation of environmental sustainability objectives.

The speed inherent in information and communication technology use has brought additional benefits in terms of bridging the gap between scientific data, policy decisions, action and education. This has the additional bonus of improving environmental governance by increasing the transparency of decision–making processes and enhancing public awareness of environmental concerns, thus complying with the objectives set out in Chapters Thirty Six and Forty of Agenda 21. The potential being opened up by these new patterns of ICT supported communication, policy formulation and education is revolutionary and still far from being appreciated adequately and needs to be further explored.

It has also been increasingly recognised that the application of information and communication technologies can bring about environmental benefits through schemes such as teleworking and the development of e–commerce solutions.
Regional strategies (e.g. European Commissions e–Europe strategy) could also offer a way to maximise the potential economic and environmental opportunities associated with the shift to an information society in across the globe. This should not be a case of "grow now, clean later" but "grow a clean industrial structure now" and share knowledge in the process.\(^8\)

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**Criticality of Innovativeness in Communities**

*Agenda 21* clearly realised the criticality of local communities, and civil society in general in managing the local environment and almost every chapter contains a reference to the need to involve communities at the local level in environmental management. The increasing attention that is being focused on the local level has raised concerns regarding the capacity of local institutions and groups, including communities and citizens groups, to address local concerns while keeping global issues and implications in mind. This highlights the criticality of developing innovative capacities at the local level, to be able to come up with local resources and local solutions to solve local problems that have beneficial global impacts. The urgency of translating global talk to local action, and building capacity to facilitate that action, has spurred much discussion on the criticality of innovative action by and for communities.

Many ingredients go into the development of successful community–centered local environmental management, but key is the facilitative, or fostering, environment that enables communities to be innovative. Innovative communities nurture new ideas and solutions, focusing on knowledge, education, information exchange, networking. Absorption and diffusion of knowledge and information is a critical part of its innovativeness. These communities can better manage development with a long–term perspective, focusing on implementation, behavioural change, and lifestyle. Innovative communities also tend to be more sustainable because of their capacity to respond to changes in the larger environment. They are better able to utilise their resources in a way to ensure that community members can attain a high degree of health and well–being, economic security, and have a say in shaping their future while maintaining the integrity of the ecological systems on which all life and production depends.

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\(^8\) The UNU is implementing a number of projects under the theme of ICT and the Environment. These include projects on information harmonisation for national reporting on multilateral environmental agreements, exploratory research on the impact of ICTs in relation to environmental conservation, and an exciting initiative called the UNU Virtual University.
Institutional Framework for Sustainable Development

For WSSD one of the most crucial areas is strengthening the institutional framework for sustainable development. Why? Policymakers need to ask themselves a very simple question. If most indicators show continued environmental degradation despite a proliferation of organizations and institutions put in place to protect the environment and work towards sustainability, then logically this begs the question of whether institutions are not the problem? Have they been effective enough? How can we strengthen them to fully address the scope, magnitude and complexity of sustainable development?

To effectively protect and preserve the natural environment, environmental institutions, at all levels of governance, must better reflect the link between environmental problems and the underlying economic and social issues that most likely led to them. In this respect, all aspects of the debate over institutional reform is influence by the recognition that, in an increasingly globalised economy, international environmental institutions must be able to address key social and economic issues that may not be included in their primary mandate.

Without an overarching structure or process to provide guidance, one of the keys to establishing and maintaining coherency within sustainable development governance lies in the relationships between the institutions of different regimes, including, environment, trade, health, and peace and stability. The development of strong and clear complementarities and compatibilities between different international regimes and bodies of international law will both help to create, and reflect, a balance between the three pillars (economic, social, and environmental) of sustainable development.

An explicit recognition of the inherent links between the economic, social, and environmental aspects of sustainable human development was evident at the first UN Conference on Environment and Development ten years ago. Yet, this recognition is still not adequately reflected in the overall architecture of the international governance system.

The lack of coherency within the formal international institutional architecture reflects the high level of disagreement that still exists in regard to what would constitute an effective and appropriate approach to achieving sustainable development.

The inability of the international community to agree upon a common approach to sustainable development governance is rooted, to a large extent, in disparities between the perspectives and priorities of developed and developing countries. Reducing and overcoming these disparities remains, therefore, a critical
prerequisite for the creation of an effective, efficient, and equitable system of sustainable development governance.

The following section looks at how to strengthen sustainable development governance from three levels, between the institutions of the three pillars of sustainable development, within the environmental governance sector itself and between the scales (local, national, regional and international).

**Strengthening Governance Between the Three Pillars of Sustainable Development**

What is the Most Effective Governance Framework for Sustainable Development?

The international community, in the past decade, has expressed growing concern over the proliferation of international legal and institutional arrangements aimed at addressing specific environmental problems. This concern centers not only on establishing a functional framework for coordinated international action but also for maximising the limited resources available for environment protection.

Recently, the Secretary-General of the United Nations established a Task Force on Environment and Human Settlements as part of the overall reform of the United Nations, and noted the formidable challenge facing the international community in attaining "a sustainable equilibrium between economic growth, poverty reduction, social equity and the protection of the Earth’s resources, common and life support systems.” He also concluded that experience had demonstrated the need for a more systemic approach to policies and programmes through mainstreaming the United Nations commitment to sustainable development.

Many of the specific proposals put forward with this goal in mind involve reforming existing UN bodies in an effort to provide them with a broader role, for example, UNEPs Global Ministerial Environment Forum (GMEF), the Commission on Sustainable Development (CSD), the Economic and Social Council (ECOSOC), and the UN General Assembly.

i. GMEF

In 1999, the UN General Assembly established the GMEF as an annual, Ministerial-level forum, with the UNEP Governing Council constituting the forum in the years that it meets in regular session, and in alternate years it is to take on the form of a special session of the Governing Council. An effectively functioning GMEF could help strengthen the normative authority of UNEP. It could clarify the links between UNEP and existing instruments, such as MEAs. It would also clarify the role of UNEP in contributing to the wider sustainable development agenda. Similarly, as the G-77 has recently proposed, the GMEF could be
remodelled to transcend the mandate provided the UN General Assembly and "provide general policy guidance to, and promote coordination with, the other relevant organizations in the environmental field".  

ii. CSD

Rather than seek a more powerful mandate or higher intergovernmental status, a better approach may be to redirect the CSD toward the type of work where it could make a difference and combine it, where possible, with similar UN organizations that focus more closely on aspects of sustainable development. Rather than “bigger and broader”, the focus should be more narrowly focused on tasks that the CSD could actually accomplish and to areas where it could add value. A redefined mandate, therefore, could include the following:

A more narrow and realistic focus for the CSD could be to train its focus on the functioning of the UN itself, rather than the world as a whole. A systemic approach would focus, in simplest terms, on what the UN is or is not doing; or if the UN is acting, is it adequately addressing the sustainable development aspects of any given issue area. Two of the CSD’s most notable areas of successes stem from the CSD-7 decisions on oceans and tourism, both of which led to actual changes in the manner in which the UN considered these issues. Its decision on oceans, inter alia, recommended that the General Assembly establish an open-ended informal consultative process to facilitate the consideration of matters within the GA’s existing mandate. For tourism, it actually introduced the issue into the Rio process and developed an international work programme on sustainable tourism. In both examples, the CSD focused on how it could contribute to integrated decision-making by providing better consideration of the overall policy matrix.

This approach for the CSD should be distinguished from the coordination role under consideration for the EMG. Governments clearly attach importance to coordination efforts that go beyond issue management and proposed actions, which strive for enhancing policy coordination across the UN system, include reporting annually to GMEF on specific issues arising from the work of the UN system in the environmental area. While a systemic approach for the CSD could overlap to some extent, its revised mandate should go beyond environmental matters to address developmental aspects as well.

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10 EMG was established following the adoption of General Assembly resolution 53/242, and includes amongst its members the specialized agencies, Funds and Programmes of the United Nations system and the secretariats of multilateral environmental agreements. It follows an issue-management approach whereby issue-management groups are established within the organizations concerned in order to address specific issues identified by EMG within an established time frame. Issues selected so far include the harmonization of biodiversity-related reporting, the development of a system-wide approach to environmental education and training, waste management and chemicals.
iii. ECOSOC

ECOSOC could play a useful role in terms of providing for greater coherency and direction to all environment-related UN activities. Its broad mandate, which encompasses economic, social, human rights and other issues, could provide a basis for integrated and comprehensive institutional development because it offers scope for some adaptability. ECOSOC could attempt to develop its coordination function, which encompasses a large part of the UN system. This could involve strengthening its relationships with UN specialized agencies and strengthening its current role in promoting integrated and coordinated follow-up to major UN conferences.

The political acceptance of new role for ECOSOC would be limited in light of its less than prominent role in the past. ECOSOC is not generally regarded as an effective body. The Secretary-General’s proposals for UN reform in 1997 noted that there may be a need for a long-term fundamental rethinking of the role of ECOSOC, in addition to the immediate priority of enhancing its policy management and coordinating roles. The issue of Charter revision could also arise if extensive adjustments were made to ECOSOC’s area of activity. This would be difficult if attempted, in that ECOSOC’s mandate is extremely challenging because it “competes” with the Bretton Woods institutions (the IMF and World Bank) in its task of advancing UN purposes in the economic and social areas. Furthermore, ECOSOC’s large subsidiary machinery makes it difficult for it to implement a strong coordination role.

iv. A New General Assembly Committee on Sustainable Development

Another option for sustainable development governance is to increase the sustainable development focus of the General Assembly, possibly through a new committee. The General Assembly debates on environment and sustainable development could provide more overall direction to the international regime, as well as highlight broad priorities and address overlaps and unclear mandates. Recent developments on enhancing complementarities among international instruments related to environment and sustainable development could be built on.

One limitation is that the General Assembly’s large membership and extensive agenda may not provide an ideal basis for effective outcomes, as many of its resolutions tend to have little impact. The non-binding nature of the Assembly’s resolutions has attracted attention, with detrimental comparisons being drawn with the decision-making powers of the Security Council. UN reform proposals have tried, but so far mostly failed, to focus the Assembly’s agenda and revitalise its debates.

The most prominent obstacle is that issues on the Assembly agenda usually become part of a complicated package of trade-offs, which means environment
and sustainable development can “lose out” in the process. The personalities and working methods of the Assembly, for example the informal, unpredictably scheduled processes for agreeing resolutions, can also be a problem.

Nonetheless, developing countries view the Assembly as a body in which their interests are fairly represented, which could help build acceptability of reinforcing the Assembly’s role. It also has the power and legitimacy to coordinate economic and social institutions outside the environmental sector.

Sustainable Development Law

There is a strong need for coherency and complementarity between international environmental law, emerging sustainable development law, and the wider corpus of international law. Whatever dispute settlement, enforcement, or judicial mechanisms that exist or that are emerging to support international sustainable development governance, they must be able to work in close coordination with other international organisations, courts, tribunals, and also the wider nongovernmental community. For example, the GATT/WTO system when it was first established as the trade regime it was wrongly considered as a special regime de-linked from other rules of international law, including international environmental law. It is in fact this de-linking of the trade regime that represents a large part of the current challenge for the architects of international law.

Strong arguments can be made in support of the current system of institutional monitoring, a system that has, one should add, been relatively successful in terms of achieving compliance and avoiding disputes. At the same time, there is no technical or specific reason why a system of judicial enforcement could not complement, rather than replace, the current monitoring system. This could be done either (1) by injecting a stage of third-party adjudication, based on the rule of law (not power-politics), into current compliance procedures, or (2) by providing for a distinct process of judicial settlement when compliance procedure have failed to resolve a matter.

Without a judicial branch of international sustainable development law there is a danger that a two class society of international norms will develop based on those that can be judicially enforced, such a WTO rules, and those that can not. Judicial enforcement of international sustainable development law would help ensure that sustainable development norms do not become second tier norms.

The lack of compulsory universal, or semi-universal, enforcement or dispute settlement mechanisms within international environmental law and sustainable development law is the result of a political decision on behalf of states that will not be resolved by institutional reform. Judicial settlements have not happened because states are reluctant to grant jurisdiction to courts and tribunals that would allow states and or non-state actors to challenge their environmental policies or conduct.
Until such point in time, if ever, that the political will to exists to establish an international judicial organ, with both compulsory and universal jurisdiction, the purposes of international sustainable development governance may be well served by strengthening concern for the environment within other international regimes such as trade (WTO dispute settlement mechanisms) and peace and stability (UN Security Council) in the context of the environment.

**Strengthening Coordination Within the Environment Sector**

Interlinkages between Multilateral Environmental Agreements at the Regional and National Level

In recent years, attention has focused on improving inter–agency coordination at the global institutional level, mainly as a result of the UN Secretary–General's proposals for better issue management and the 1998 Report of the UN Task Force on Environment and Human Settlements. Several of the Task Force's recommended actions pertain either directly or indirectly to the growing number of linkages among environmental conventions.

While efforts to enhance synergies at the global level must continue, challenges and opportunities for enhanced coordination at the regional and national levels also need to be addressed. Examining the dynamics of these two scales is important for a number of reasons. First and perhaps foremost, abundant natural linkages exist in ecosystems having boundaries within and across the sub–national, national and regional levels. This geographic grouping offers promising scales to implement agreements using a synergy approach and can achieve visible as well as tangible results on the ground.

Second, implementing global multilateral environmental agreements often requires regional frameworks and cooperative action plans to specify how global agreements can be applied to the contextual particularities of a geographic or ecological region or sub–region. Such frameworks and action plans are elaborated regularly in the scope of regional or sub–regional intergovernmental meetings, such as the African Ministerial Conference on the Environment, the Asia–Pacific Ministerial Conference on Environment and Development, the ASEAN Senior Officials on the Environment or South Pacific Environmental Cooperative Programme. They may also result from the negotiation of specific arrangements designed to apply global multilateral environmental agreements to a given region, or to protect a threatened resource in a given area. The same

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13 The regional and national levels are defined broadly. Regional may comprise any sub–regions; national may include sub–national and local levels.
applies to the national level in the sense that global and regional agreements require action plans (NAPs) and strategies that provide guidance on how environmental commitments will be implemented sub-nationally and locally.

Third, although there are worthy avenues to establish synergy and mutual support among global multilateral environmental agreements (e.g. Rio Conventions), most agreements are regional in scope, such as the various environmental conventions negotiated under the auspices of the UN regional economic commissions or sub-regional organisations and programmes (e.g. ASEAN, SPREP, SACEP). There are also interesting avenues and possible synergies to pursue across regional and sub-regional arrangements.

Fourth, many of the administrative problems experienced at the global level also surface at the regional and national levels in the form of coordination and conflicting institutional roles, communication failures, duplication, etc. For effective implementation to take place it is important to address any existing deficiencies that may impair proper and effective environmental management.

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Clustering of Multilateral Environmental Agreements

A fundamental starting point for environmental law and policy is science. The bio/geophysical relationships between sectors, substances and the inter-relationship of ecosystems, and activities that multilateral environmental agreements seek to protect or regulate, provides an obvious organising principle for their coordination. From this starting point policymakers could ensure greater effectiveness and cost efficiency of multilateral environmental agreements by initiating a process to strategically group MEAs together according to their scientific and natural relationships. A suggested grouping could be the following:

- Conventions related to biodiversity (possible sub-clusters are regional, sea, etc)
- Conventions related to oceans and seas
- Conventions related to fresh water, forests and lands
- Conventions related to the atmosphere
- Conventions related to chemicals and hazardous wastes

Pragmatic work programmes could be devised within each grouping based on common functions such as capacity development, technology transfer, education and awareness raising, and information dissemination and reporting. Such clustering should consider more effective modalities for future international

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14 Ibid.
negotiation, scientific assessment, and international–regional–national implementation and coordination. There is no one single approach to the strategic integration, or clustering, of MEAs that is likely to present the most beneficial or practical option because each clustering effort should be aimed at resolving a specific problem or weakness in the current system. The most promising way to approach the clustering of MEAs appears to be a pragmatic combination of approaches. In each case, it would need to be assessed which elements or functions of which MEAs can reasonably be integrated.

The clustering of MEAs is best understood as a step-by-step process rather than as an objective in itself. As a first step, structures for co-ordination between MEAs can be established and/or elaborated and diversified, including joint meetings of convention bodies and secretariats, memoranda of understanding, joint implementation of common activities, communication networks, routines and structures etc., where appropriate and feasible. Such co-operative arrangements might then evolve over time leading to more formal structures of co-ordination.

Further information: Please contact UNU/IAS: W. Bradnee Chambers chambers@ias.unu.edu or UNU/GEIC: Jerry Velasquez jerry@geic.or.jp

**Strengthening Governance Between Scales (Local, National, Regional, International)**

National Frameworks for Sustainable Development\(^{15}\)

Strategic planning frameworks for sustainable development are an effective method of identifying the priorities, compromises, and trade-offs that countries must take account of in order to achieve sustainability. Such frameworks should measure progress and set priorities. They should also serve to identify, analyse, and help show how best practices can be adapted in pursuit of the socio–economic and environmental goals outlined in *Agenda 21*. As an example of how such frameworks could be constructed UNU has formulated three strategic frameworks that focus on China, India, and Indonesia. The frameworks were country driven and took into consideration specific country factors that are inherent to large developing countries. These include the tremendous population pressures that can give rise to deforestation and soil erosion as well as the natural resource endowments of each country.

Many of the key recommendations put forward in the sustainable development frameworks formulated within UNU projects have centred on the need to create more effective, integrated, and transparent national institutions. Such institutions

are required to develop the kind of broad packages of policy instruments, including economic instruments, which are essential to sustainable development. These institutions are also crucial in terms of reconciling economic development and environmental priorities within large countries with diverse populations. This is even more so the case given the additional pressures that are caused by rapid globalisation.

The effectiveness of these integrated national institutions will depend, to a large extent, on their capacity to establish positive partnerships with national and international private sector interests and also upon their ability to engage civil society and community actors in a constructive manner. This is because some of policy reforms directed towards sustainable development are controversial nature such as raising prices, closing polluting factories, accepting international agreements and prohibiting farming or grazing in degraded ecosystems. Without popular support for these reforms, changes will be difficult and well designed. The effectiveness of these institutions will also depend on their success in terms of coordinating the work of various ministries and agencies in order to reduce the overlaps and contradictions that exist between them. Their effectiveness would also be enhanced if they prove capable of taking advantage of any possible synergies that exist between various ministries and agencies.

Further information: Please contact UNU/IAS: T. Palanivel palani@ias.unu.edu or http://www.ias.unu.edu/research/sdf.cfm

Subsidiarity and Environmental Decision–Making 16

The principle of subsidiarity, which calls for decisions to be made and implemented at a level appropriate to the problem they address, should be facilitated in environmental management and governance. Ecosystems are best defined, understood and protected at the regional or local level rather than the global level. The level and type of decisions taken have to match the scale of the challenge or issue. This has long–term implications for the empowerment of communities and their ability to decide for themselves those aspects that affect their everyday lives. Creating an environment that facilitates such subsidiarity is a challenge for local governments, stakeholders, and for those responsible for global decision–making as well as regional and national implementation.

Further information: Please contact UNU/GEIC: Jerry Velasquez jerry@geic.or.jp or visit the GEIC website http://www.geic.or.jp/interlink/ or UNU/IAS: W. Bradnee Chambers chambers@ias.unu.edu.

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UNU Partnerships and Activities to Implement Agenda 21

The overarching goal of UNU is to advance knowledge for human security and development. To this end, the overwhelming majority of our research and capacity building efforts are focused on developing countries and the issues that concern them the most, including sustainable development. A large share of UNU's budget is specifically devoted to its post-secondary education and capacity development programme. A recent survey among the various contributors to UNU's capacity development activities has shown that these are widely and highly appreciated and have in many cases been critical to the career development of the participants. Encouraged by this assessment, UNU is establishing a UNU Capacity Development Fund to help strengthen and further expand its capacity development programme.

All parts of UNU system engage in capacity development activities. These are aimed, in particular, at strengthening academic institutions in developing countries and increasing the capability of young scholars and professionals in these countries to contribute to the extension, application and diffusion of knowledge. UNU places a strong emphasis on strengthening cooperation among institutions in developing countries and building "south–south" cooperation to further enhance the teaching and research capacities of existing centres of excellence. The University also aims to alleviate the intellectual isolation of researchers and institutions from developing countries by supporting their integration into the wider international academic community.

Throughout the last ten years UNU has undertaken a wide range of both long-term and short-term post-secondary education and capacity building activities that are aimed at enhancing the potential of developing countries to meet their environmental and development objectives. Many of these activities were explicitly endorsed within Agenda 21 and also fall under the umbrella of action recommended within the Lüneburg Declaration on Higher Education for Sustainable Development.

Further information: Please contact UNU Centre. Birgit Poniatowski poniatowski@hq.unu.edu or http://www.unu.edu

Please Note: The following summary is only intended to represent a broad outline of the types of activities UNU has engaged in over the last decade. A more detailed outline of UNU activities in this regard may be found in the University's annual reports and the reports of the various research and training centres and programmes.

Transfer of Environmentally Sound Technology, Cooperation and Capacity–Building

Fisheries
Over-capitalization of the world's fishing fleet has led to over-exploitation of fishery resources and world fisheries are now on the verge of becoming another natural resource disaster. This situation has created a new demand for high professional standards in relation to a large number of fisheries skills, particularly in the developing world. In order to meet the growing needs of developing countries in this regard, United Nations University, in cooperation with the Marine Research Institute of Iceland and with the support of the Government of Iceland, holds an annual six-month fisheries training course. This course provides advanced training in various fisheries-related areas to specialists from the public, private and academic sectors in developing countries. Provincial fisheries administrators, fisheries scientists and operational managers, economists, planners and technicians receive in-depth, individualised training in fisheries policy and planning; marine and inland waters resources assessment and monitoring; quality management of fish handling and processing; management of fisheries companies and marketing; fishing technology; fleet operations; aquaculture; or environmental protection assessment and monitoring.

Further information: Please contact UNU/FTP Tumi Tómasson tumi@hafro.is or http://www.hafro.is/unuftp/

Geothermal Energy
The overall aim of UNU Geothermal Training Programme in Iceland is to assist developing countries that have significant geothermal potential to build groups of specialists with a competence in most aspects of geothermal exploration and development. In each annual six-month course, specialised training is offered in geological exploration, borehole geology, geophysical exploration, borehole geophysics, reservoir engineering, chemistry of thermal fluids, environmental studies, geothermal utilization, and drilling technology. The trademark of this training course is that it provides university graduates that are engaged in geothermal work, very intensive on-the-job training in their chosen fields of specialisation. The trainees work side by side with professionals of Orkustofnun, an agency actively working on most aspects of geothermal research, exploration, and development. Within each course, the training is tailor-made for each individual and the needs of his/her institution or country.

Further information: Please contact UNU/GTP Ingvar Birgir Fridleifsson os@os.is or http://www.os.is/unugtp/

Software Technology
The UNU Institute for Software Technology in Macau, China, provides advanced training to young software engineers from developing countries. Training is offered in software research and development, curriculum development for postgraduate and postdoctoral courses in formal software development, and the development of curricula for computer science departments. Recently, the Institute extended the scope of its advanced courses and training schools on the
RAISE method and duration calculus, creating web sites and algorithmics to include new training courses on software project management and the co-design of hardware and software systems.

Further information: Please contact UNU/IIST Prof Zhou Chaochen
iist@iist.unu.edu or http://www.iist.unu.edu/

**Food Technology**
With the aid of private funding, UNU organises an annual twelve-month training programme on food science and technology at the National Food Research Institute in Tsukuba, Japan. The programme targets scientist at universities or research institutes in developing countries, with a particular emphasis on the Asia-Pacific region. The programme covers a wide range of research activities and its focus includes such topics as technology development for food processing and distribution food safety, scientific evaluation of food and food components in relation to human health, and the identification and utilisation of new functionalities found in living organisms.

Further information: Please contact UNU Centre Birgit Poniatowski or http://www.unu.edu/capacitybuilding/shortcourses.html

**Science for Sustainable Development**

**Biotechnology**

The UNU Programme for Biotechnology in Latin America, located in Caracas, Venezuela, focuses on modern biotechnology–related health issues, bioethics, biosafety, bioinformatics and genomics. The overall objective of the programme is to promote the development of biotechnology in Latin America through research and academic exchange. These academic exchanges are carried out through the awarding of fellowships for research and advanced training in leading biotechnology laboratories within the region and also through the conduct of short training courses. These training courses are aimed at young scientists and technicians, both from academia and the private sector. The programme also assists in the establishment of links between biotech institutions in the developed world and similar institutions in Latin America. A specific effort is also made to better inform countries within the region of existing biotechnology resources that could be used to promote technology transfer.

Further information: Please contact UNU/BIOLAC José Luis-Ramirez
unu@reacciun.ve or http://www.unu.edu/capacitybuilding/Pg_biolac/pg.html

**Science and Environmental Decision-Making**

The political–scientific interface has emerged as one of the key dimensions of multilateral negotiations and environmental diplomacy. For this reason, the
capacity of diplomats and other actors to access, understand, and deal with increasingly complex factual and scientific data is of critical importance. With this in mind, the UNU Institute of Advanced Studies has conducted a number of capacity building seminars aimed at providing negotiators from developing countries with better access to, and a more in–depth understanding of, the key scientific issues that have become increasingly relevant to multilateral environmental negotiations. These seminars have focused on the issues of climate change, trade and the environment, and biodiversity and have taken place primarily in the ASEAN and MERCOSUR regions.

Further information: Please contact UNU/IAS W. Bradnee Chambers or http://www.ias.unu.edu

Promoting Education, Public Awareness and Training

Leadership

Leadership is critical to resolving conflicts, building peace, protecting the environment, reducing poverty, and ensuring sustainable development. The art and skills of leadership, its ethics and values, and the tasks and competencies required to make good leaders in a national, regional and global context are in pressing demand. The UNU Leadership Academy in Amman, Jordan, is dedicated to the task of imparting leadership education to outstanding mid–career men and women from around the world through intensive courses encompassing theoretical and experiential learning. This task is undertaken with a view to the particular needs of developing countries. This translates into an emphasis on the issues of crucial importance to the developing world, such as sustainable development, and also an effort to solicit a high level of course participation from developing country representatives.

Some of the more recent activities have included a three–week intensive leadership for poverty reduction course held in September 2001 and a leadership training course for African women entrepreneurs that was held in Ghana in 2001. This latter course built upon a UNU Institute for Natural Resources in Africa study on African women who have succeeded as professionals and entrepreneurs in natural resources management enterprises. Previous courses have focused on such issues as disaster management.

Further information: Please contact UNU/LA at un2@ju.edu.jo or http://www.unu.edu/la/index.htm

Degree–Oriented Programmes

UNU helps to upgrade the academic qualifications of young researchers, particularly from developing countries, through three types of programmes: Ph.D.
internships, programmes that lead to the award of a degree, and postdoctoral fellowships.

UNU Ph.D. Internships provide Ph.D. candidates who have been accepted in Ph.D. programmes, particularly at universities in developing countries, with the opportunity to conduct part of the research for their dissertation at one of UNU’s research and training centres. Interns gain access to the latest scientific information, receive expert advice from the academic staff of the institute and can link up with the wider academic community at the location of the institute. These interns take up short–term positions at several UNU research and training centres including: the UNU World Institute for Development Economics in Helsinki, Finland, the UNU Institute of Advanced Studies in Tokyo, Japan, which focuses on sustainable development research, and the UNU Institute for New Technologies in Maastricht, the Netherlands, which conducts policy research on the economic and social impact of new technologies in the developing world.

UNU currently supports three degree–oriented studies programmes. Fellowships for Masters and Ph.D. studies in the field of Science and Technology for Sustainability are available at the Kwangju Institute for Science and Technology. Once every biennium, UNU awards fellowships to students, mainly from anglophone Africa, to participate in the two–year postgraduate training programme in nutrition planning offered within the framework of the Applied Nutrition Programme at the Department of Food Technology and Nutrition of the University of Nairobi, Kenya. The UNU Institute for New Technologies in Maastricht and the Maastricht Economic Research Institute on Innovation and Technology, a division of the University of Maastricht, have, since 1995, jointly offered a Ph.D. programme on the economic and policy dimensions of technical change.

Postdoctoral fellowships are newly available at the UNU Institute for Advanced Studies for research in the areas of biodiversity, biosafety and sustainable development; information technology for the environment; ecosystems and socio–economic impacts; urban ecosystems; and ecosystems and multilateral institutions. Roughly eighty percent of these positions are awarded to suitably qualified candidates from developing countries.

Further information: Please contact UNU Centre Birgit Poniatowski or [http://www.unu.edu/capacitybuilding/degree.html](http://www.unu.edu/capacitybuilding/degree.html)

Disseminating Capacity Development Expertise

The concept of integrated capacity development includes the manifold non–regular training seminars and workshops that are conducted in direct connection with ongoing UNU research projects. In the past, a number of UNU research and training centres and programmes have engaged in a large number
of these types of ad hoc capacity development activities, the details of which can be found on each centre’s website.

Some of the most recent non–regular capacity building activities have included a training workshop for local practitioners and managers on a predictive model of physical, chemical and water quality processes in Lake Malawi that was organised by the UNU International Network on Water, Environment and Health in 2001 and also a capacity development workshop for integrated approaches to the biosafety of genetically modified organisms that was organised by the UNU Institute of Advanced Studies and held in Jakarta, Indonesia, in 2001. The Institute of Advanced Studies also conducts a short training programme that seeks to enhance the skills, tools, and knowledge of various stakeholders vis–à–vis recent advances in environmental research and management. These courses are conducted in collaboration with regional academic institutions such as the Asian Institute of Technology and normally target mid–career academics, government officials, and personnel from non–government organisations, particularly from developing countries.

In close connection with their research work, UNU research and training centres assist institutions of higher learning in developing countries to upgrade their teaching curricula. Some of the most recent efforts in this regard have included the UNU Institute for Natural Resources’ development of a modular postgraduate training course in environmental management and policy analysis for use by universities in Africa and also the support offered by the UNU Institute for Software Technology to universities in the development of curricula for computer science departments.

UNU also cooperates with international and national organisations to upgrade capacity development strategies in their fields of work: The UNU International Network on Water, Environment and Health, for example, co–organised an international symposium on human capacity development in the water sector in Delft, the Netherlands, to feed into the upcoming International Conference on Freshwater, the World Summit on Sustainable Development, and the Third World Water Forum. The UNU Food and Nutrition programme has also conducted a number of workshops in Africa aimed at identifying strategies for capacity development in nutrition leadership, which will be followed up in the coming years with various capacity development initiatives.

Further information: Please contact UNU Centre Birgit Poniatowski or http://www.unu.edu/capacitybuilding/index.htm

Virtual University

In 1996 the UNU Institute of Advanced Studies initiated the Virtual University project. More recently, from 2000 onwards, UNU, UNEP, Agder University College and a number of universities across the globe have been collaborating in
the development of a Global Virtual University on Environment and Development. The initiative promotes the co–development of online courseware on environment related themes between institutions and experts from the North and South. A decentralised delivery system is being developed for courseware through collaborating institutions in the developing world supported by mechanisms to ensure face–to–face interaction between students and lecturers initially via the Norwegian University system. Provision will also be made to ensure enhanced access for learners to environment related information from within the UN system and its networks utilizing products and processes including UNEP’s groundbreaking Global Environmental Outlook 2000 report.

Further information: Please contact Ng Chong chong@ias.unu.edu or http://vulab.ias.unu.edu

Information for Decision–Making

Biodiversity

UNU and UNESCO jointly offer a two–week international training course on coastal biodiversity in mangrove ecosystems at the Center of Advanced Study in Marine Biology of Annamalai University in Tamil Nadu, India. The course provides training in the methodology for assessing, monitoring and conserving biodiversity in mangrove ecosystems for young professionals with a postgraduate degree in marine sciences or a closely related field. UNU also cooperates with the University of Ghent to offer professionals in the fields of monitoring, conservation and management of biological diversity in developing countries in–depth training to broaden their theoretical knowledge and practical capabilities.

Further information: Please contact UNU Centre Birgit Poniatowski or http://www.unu.edu/capacitybuilding/index.htm

Food Composition Data

Compilations of data on the nutritional composition of foods are essential tools for nutritionists, especially those concerned with studies of nutrient intake in populations and at the individual level as well as for those involved with feeding large numbers of people or designing diets for people with specific needs. Since 1995, UNU has cooperated with the Food and Agriculture Organisation to offer courses to those involved in nutritional database programmes as analysts and/or compilers, those teaching nutrition and nutritional aspects of food chemistry as well as users of nutritional databases who wish to have a better understanding of how databases are prepared and the constraints upon their use. Courses have been held at Wageningen Agricultural University in the Netherlands and also in Chile in 1995, in Argentina in 1996, in South Africa in 1997 and 1999, and in Jamaica in 2001.
Further information: Please contact UNU Centre Birgit Poniatowski or http://www.unu.edu/capacitybuilding/index.htm