



## DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS

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28 January – 8 February 2002

# BREAKING DOWN THE BARRIERS TO SUSTAINABLE DEVELOPMENT

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**United Nations University Report**  
**2<sup>nd</sup> Session of the Preparatory Committee for the**  
**World Summit on Sustainable Development**  
**28 January- 8 February 2002, New York**

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**SUSTAINABLE DEVELOPMENT**

**Introduction**

Since the first UN conference on environment and development was held in Rio de Janeiro in 1992, the sustainable development agenda has been transformed from global aspiration to human imperative. During this time the obvious decline in the condition of the natural environment has generated a global appreciation of the urgency with which we prepare for the 2002 World Summit on Sustainable Development. This sense of urgency has been heightened by a growing recognition of the critical need to address the widening gap that continues to divide the world's richest inhabitants from its poorest.

Throughout the last decade, many developed states and regions of the world have been able to embrace the opportunities and advantages that have accompanied rapid globalisation. At the same time, many developing states and regions have become even more deeply entrenched within a vicious spiral of poverty and debt. A failure to strengthen the capacity of the developing world to take advantage of the positive aspects of economic globalisation and the numerous spectacular advances in human technology, will only result in a further increase in the strain on the global environment. If greater efforts are not made to address the imbalance of capacity, developing countries will most likely continue to put pressure on their natural resources as they endeavour to meet the development needs of their citizens.

These realities all point to the same core consideration, that sustainable development goals must be more effectively mainstreamed within the broader global political agenda. This is why the 2002 World Summit on Sustainable Development in Johannesburg is so crucial. The summit has the potential to serve as a turning point in regard to the way that the international community attempts to pursue 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 and integrated manner. This would require the development of a more strategic approach to the implementation and achievement of the priorities set out in 1992 in *Agenda 21*.

The United Nations University has, within its mission to research pressing global problems of human survival, development, and welfare, placed a keen emphasis on the identification of major obstacles on the path to sustainable development. At the same time, the university has placed a high priority on the location of timely and innovative ways to remove these obstacles. In this regard the university has developed a comprehensive, multi-layered, research approach to the study of sustainable development. Within this context, the university's international network of researchers has examined various challenges for

sustainable development that are located at the local, national, regional, and global levels and then explored the ways and means through which these can best be tackled. This has evolved into, among other things, an emphasis on the development of integrated local, national, regional, and global policy formulation and implementation frameworks. These efforts have been reinforced by a number of cross-cutting research projects that have focused on the broader issues and processes that shape the interaction between human beings and their environment, such as, information technology, biotechnology, and the institutions of global governance.

At the core of the university's research is the goal of greater global equity in terms of both opportunity and reward. To this end, our research and capacity building initiatives have remained focused firmly on issues that challenge developing country regions the most. This is the case, whether these challenges emanate from within the regions themselves or from global systems, structures, and processes that operate outside their immediate influence and control.

With this goal in mind, this report offers a summary of some of the University's core research activities and findings in regard to the myriad challenges of sustainable development. The first section of the report is structured around an assessment of the status of implementation of key chapters of *Agenda 21*. This is followed by a summary of the key challenges to the more effective implementation of *Agenda 21*. The report concludes with an outline of the key research findings generated within a number of the University's research projects. These findings are presented in the form of innovative proposals for the removal current barriers to the effective implementation of *Agenda 21*.

### **Assessment of the Implementation of Agenda 21**

The World Summit on Sustainable Development represents a much need opportunity to conduct a global review of the implementation of *Agenda 21* in its entirety. The enormity of this task is surpassed only by its importance. The UNU hopes to contribute to the global assessment through making available the key research findings of various projects that have direct relevance to specific chapters of *Agenda 21*.

*Note that the following assessment is based on UNU research results and in some cases the scope of this research activity has been limited to certain regions or countries or only related to certain chapters of Agenda 21, in which the case results and coverage may not be comprehensive.*

#### **Chapter Three: Combating Poverty**

The university's efforts to formulate sustainable development frameworks for large developing countries has revealed that, in terms of the number of people who have escaped absolute income poverty over the last twenty years, it is China that has made the most significant contribution to global poverty reduction. Over the past two decades China has achieved much in regard to the alleviation of poverty among its population. According to official estimates, the number of people now living below the poverty line decreased from 250 million in 1978 to approximately 34 million in 1999. In the last decade China began a number

of initiatives aimed at encouraging the development of townships and enterprises in the poor central and western parts of the country. Similarly, the central government has initiated a voluntary resettlement scheme for those who are willing to leave areas with poor natural conditions and resources.

While India has also achieved significant reductions in poverty ratios during the last two decades, the country is still home to approximately one quarter of the world's poor. National Sample Survey data from India, which covers the period July 1999 to June 2000, indicates a very significant decline in poverty levels throughout the 1990s. In 1986-87, poverty rates were 26 percent based on a 30-day recall and 23.3 percent based on a seven-day recall methodology from 38 percent. These figures demonstrate a decline of around one percent per annum. Indonesia also reduced poverty ratios significantly during the last 20 years from 50 percent to approximately 10 percent. These figures represent significant progress particularly given the dramatic impact of the East Asian crisis on the Indonesian economy.

#### Chapter Five: Demographic Dynamics and Sustainability

In the 1990s, China, India and Indonesia improved their family planning policies. All three countries have adopted integrated population control strategies that include much broader objectives such as human development, poverty alleviation, education promotion, and also female and infant medical care. These strategies have generally succeeded in slowing population growth. The population growth rate in China decreased from 1.5 percent per annum in the 1980s to 0.90 percent per annum in the late 1990s. Similarly, India and Indonesia's population growth rates also decreased from a high of 2.12 percent and 1.84 percent per annum in the 1980s to 1.69 percent and 1.35 percent in the late 1990s respectively.

#### Chapter Six: Human Health

With the exception of HIV/AIDS, significant progress has been in the Asian region in regard to the eradication of various major diseases. As a consequence, average life expectancy within the region has risen at a much sharper rate than in previous periods. 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. It is worth noting that these countries also reduced their adult illiteracy rates significantly throughout the 1990s. During this period China reduced illiteracy from 23.0 to 16.5 percent, India reduced its rate from 50.7 to 43.5 percent, and Indonesia experienced a drop from 20.3 to 13.7 percent.

#### Chapter Seven: Promoting Sustainable Human Settlement Development

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. Of these, approximately 61 percent, or almost 1.3 billion, will be added to Asian cities. It is clear that urbanization is a driving force in terms of environmental change and that cities are not only the centers of

population increase but also the new engines of global economic growth. This is nowhere more so the case than in the Asian context and the cities in this region are, increasingly, being considered as lynchpins in the search for regional environmental if not 'earth security.'

Recent UNU studies have indicated that rapid development processes, under the influence of globalisation 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. Environmental conditions vary tremendously among cities and across the region because of 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 increasing. 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.

At present much attention has been focused on the rapidity of the industrialization process and the conditions of the regions mega-cities.<sup>1</sup> These cities are usually the capitals of their respective nations and the primary recipients of national infrastructure projects and attention. These urban centers, because of their vast size, are the location of intense extremes in environmental differentials with gleaming centres of commercial activity often situated alongside squatter residential settlements. Many of the smaller, and sometimes the fastest growing, cities are not receiving the attention they need and are often the locations of the worst environmental conditions. While urban poverty exists in all cities throughout the region, it is a dominant feature in these centers. Asian small to medium sized, and rapidly expanding, cities are generally characterized by a lack of basic services (water and sanitation) and housing, unemployment and underemployment, deficient social services, and extreme environmental degradation. This said, the positive impact of recent efforts to reduce environmental degradation within these cities is becoming increasingly evident in some regions.

#### Chapter Thirty Eight: Institutional Arrangements

#### Chapter Thirty Nine: Legal Instruments and Mechanisms

A recognition of the need to strengthen the interlinkages between multilateral environmental agreements is implicit throughout *Agenda 21*, although it was not translated into an explicit objective. As such, *Agenda 21* reversed the trend of approaching 'environment' and 'development' issues separately and put in place the basis for an integrated approach to their achievement under the broader principle of 'sustainable development.'

A cross-sectoral approach to sustainable development reflects better the natural links that exist within the earth's ecosystems and between these ecosystems and societal action. These links are both positive and negative and occur in a never-ending cycle of cause and effect that, in turn, influences human activities and the ways in which we interact with natural systems. It is already evident, for example, that any change in global climate patterns will ultimately affect every major natural and societal system in the world. As climate changes, land use

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<sup>1</sup> Cities with a total population exceeding eight million.

patterns would alter as countries attempt to cope with rising sea levels. Climate change would also alter the fertility of soil in different regions, which would impact on crop yields and possibly threaten food supplies. In addition, even slight changes in temperature would influence the outbreak and spread of major infectious diseases. Thus, any change in climate could potentially lead to the large-scale loss of livelihood, economic dislocation, biodiversity loss, decline in agriculture and food production, worsening human health, and even loss of life. It would be possible to prepare a similar list of linkages for every issue covered by each Chapter of *Agenda 21*.

In the context of sustainable development the recognition of these inherent links within the natural environment, and between natural and societal systems, has not always been translated effectively into comprehensive and coherent policy making or institution building. At present, it is still the modus operandi for the United Nations to segregate problem solving on the basis of whatever institutional framework, legal boundary, or specific issue is acceptable to the majority of parties involved the making a decision. This has led to inconsistencies between naturally synergistic environmental and societal issues, and the fragmented formal legal and institutional instruments that we formulate in an effort to manage them.

Chapter Thirty Six: Public Awareness and Training

Chapter Forty: Information for decision-making and Promoting education

These chapters of *Agenda 21* help chart an exciting new course in the transition to a new knowledge-based, participatory, economy for the Twenty First century. In the Asian region Internet use has grown rapidly and is expected to reach 130 million by 2005. Much of this new growth will be fuelled by China, whose annual rate of Internet growth over the next five years is expected to reach 60 percent. At present, Internet usage is not evenly distributed around the globe with 55 five countries accounting for 98 percent of all information and communication technologies (ICTs) in 150 countries across the globe. Of these, eleven are located in the Asia Pacific.

In this context, at the UN Millennium Summit in September 2000, heads of state and government resolved to ensure that the benefits of new information technologies are made available to all. Subsequently, the UN Secretary-General formed an advisory group of 21 experts from the private and public sectors to help bridge the digital divide by harnessing the potential of ICTs for development. According to the report of the UN Secretary-General to the CSD in December 2000, the implications of the emergence of the information society were unforeseen at Rio. Indeed, it is now widely recognized that ICTs 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.

## **Key Sustainable Development Issues for WSSD**

### *Interlinkages between MEAs*

As a result of institutional, historical, financial, or capacity reasons, the laws, conventions, treaties, institutions, mechanisms and information for the environment have been developed in isolation and are often segregated based on topic or theme. Such systems have not paid due regard to the natural interconnections that exist between ecosystems or bio-geo-physical relationships. Similarly there is a chronic lack of coordination at the international, regional, and national levels, and between environmental institutions that deal with related environmental problems. The segregation of these institutions has led to inadvertent conflicts between governance regimes, which has resulted in a general lack of institutional effectiveness.

### *Urbanisation and Ecosystems*

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 crucial, 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.

It is also of critical importance that sustainable urban environmental policies be integrated throughout all levels of governance and that they be made to include a broader range of interrelated issues such as health. In addition, policies for sustainable urban development must include “brown” “gray” and “green” issues. In poorer cities, dominant sustainable issues concern infectious diseases, access to safe water, indoor air pollution and appropriate sanitation. In rapidly industrialising cities, questions of sustainability are dominated by issues of motorisation, growth controls, air and water quality, and urban design. Finally, in richer cities of the region, key issues for urban sustainable development are those related to greenhouse gasses and other global ecosystem perturbations. All of these issues together make up the urban sustainability debate, although all do not get equal voice.

### *Zero Emissions*

Zero Emissions is a strategy for reducing waste and improving the productivity of resources by improving symbiotic linkages between industries. These goals are achieved by identifying value-added uses for process emissions as raw-material inputs for other processes. 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. While the existing track record for manufacturing industries suggests application in this area, there are examples from the agricultural industry as well, the expansion of which needs to be explored.

### *Agrobiodiversity*

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 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.

### *Prioritization of 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.

### *Globalisation*

Economic 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 a way that serves only to make the rich, richer while leaving the poorest out on the margins.

### *Greater Integration of socio-economic development and environmental protection*

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. This would lead to a better understanding at how the challenges of sustainable development could be effectively met and how solutions could most equitably be implemented. The World Summit on Sustainable Development could provide an opportunity to look afresh at different possibilities for improving current approaches.

### *Trade and Environment*

The trade and environment debate has continually raised speculation and created a climate of uncertainty concerning potential incompatibilities between international trade and MEA rules and how certain trade practices may conflict with environment and sustainable development. The underlying cause of this debate is the deep concern of developing countries that linking environment issues with trade issues within the context of the WTO will result in increased environment-related trade-restrictions that serve to limit their access to global markets. Any future negotiations must be aimed at ensuring that this concern is not realised.

Several key issues in the trade and environment debate must be clarified in both the context of the next round of trade talks launched in Doha at the 4<sup>th</sup> WTO Ministerial Conference and at the WSSD in 2002 in order to dispel uncertainty and build international confidence in our trading system and our regulations to protect the environment. These issues include the clarification of the rules between MEAs and the WTO and regional trade agreements, consistent application of environmental principles in trade dispute settlement proceedings, and addressing perverse subsidies such as fishing, agriculture, and energy subsidies that adversely affect both trade and the environment.

### *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 next year's world summit and in major environmental treaties such as the Convention on Biological Diversity. The newly launched Millennium Ecosystem Assessment 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.

## Key Findings for Consideration by the World Summit on Sustainable Development

### Key Finding ONE: Enhance Interlinkages between MEAs at the Regional and National Level<sup>2</sup>

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.<sup>3</sup>

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.<sup>4</sup> 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 MEAs 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 (AMCEN), the Asia Pacific Ministerial Conference on Environment and Development (MCED), the ASEAN Senior Officials on the Environment or South Pacific Environmental Cooperative Programme (SPREP). They may also result from the negotiation of specific arrangements designed to apply global MEAs to a given region or to protect a threatened resource in a given area.<sup>1</sup> The same 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 MEAs (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 organizations and programmes (e.g. ASEAN, SPREP,

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<sup>2</sup> United Nations University Policy Report (Draft), *Interlinkages: Synergies and Coordination among Multilateral Environmental Agreements: National & Regional Approaches in Asia and the Pacific*, Tokyo: UNU, August 2001.

<sup>3</sup> See Report of the United Nations Task Force on Environment and Human Settlements. A/53/463, 6 October 1998.

<sup>4</sup> The regional and national levels are defined broadly. Regional may comprise any sub-regions; national may include sub-national and local levels.

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 any existing deficiencies that may impair proper and effective environmental management.

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#### Key Finding TWO: Financial Mechanisms and Donor Institutions Must Promote Greater Interlinkages between MEAs<sup>5</sup>

Financial mechanisms play a key role in creating the priorities for achieving sustainable development. A close examination of current financial mechanisms and existing donor arrangements shows that although there are increasing efforts to create projects that encourage and support synergies between MEAs, efforts are still greatly lacking. Opportunities should also be explored on how common lending criteria, reporting and policies between multilateral and bilateral donor agencies could be developed. At the national level capacity needs to be strengthened to better promote integrated and coordinated policy making processes and synergistic implementation of environmental and sustainable development agreements. Innovative and alternative financing methods at national and local levels for projects that have multiple or synergistic benefits should also be explored.

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<sup>5</sup> Recommendations are drawn from: United Nations University Policy Report (Draft), *Greening the Global Financial Architecture: Towards a New Strategy of Financing and Investing in Sustainable Development*, Tokyo: UNU.

Key Finding THREE: The Principle of Subsidiarity Should be More Readily Applied in Environmental Decision-making and Implementation<sup>6</sup>

The principle of subsidiarity, which calls for decisions to be taken 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.

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KEY Finding FOUR: Clustering of MEAs is an Effective and Cost Efficient Approach to MEA Implementation<sup>7</sup>

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 MEAs seek to protect or regulate, provide an obvious organizing principle for MEA coordination.

From this starting point policy makers could ensure greater effectiveness and cost efficiency of MEAs 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 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 building, technology transfer, education and awareness raising, and information dissemination and reporting.

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<sup>6</sup> United Nations University Policy Report, *Interlinkages: Synergies and Coordination between Multilateral Environmental Agreements*, Tokyo: UNU, 1999; United Nations Meeting Report, *World Summit for Sustainable Development International Eminent Persons Meeting on Interlinkages Strategies for Bridging Problems and Solutions to Work Towards Sustainable Development 3-4 September*, Tokyo: UNU September 2001.

<sup>7</sup> Ibid.

Such clustering should consider more effective modalities for future international negotiation, scientific assessment, and international-regional-national implementation and coordination.

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### Key Finding FIVE: Trade and Environment<sup>8</sup>

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 5<sup>th</sup> Session of the WTO Ministerial Conference and be considered for the “desirability of future action” should include the following key issues:

- 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, in particular, 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.
- MEAs rules that have trade implications and which enjoy “universality” must be recognized as having supremacy and authority over conflicting trade rules. Such cases must be recognized as legitimate exceptions under the WTO and regional trading agreements. Member states of MEAs and the WTO and other economic legal instruments should conclude mutually recognized guidelines of how possible legal inconsistencies could be interpreted between their respective agreements.
- Other UN agencies and international organizations must join forces to provide greater capacity development and technical assistance to create the awareness, and expertise to ensure that trade and environment can be mutually supportive. The UNU as the premier

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<sup>8</sup> Gary Sampson and W. Bradnee Chambers eds., *Trade, Environment and the Millennium* (Second Edition), Tokyo: UNU Press, 2001.

research and training institution within the UN system could play a strong role in this regard.

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Key Finding SIX: Greater Connectivity is Required between Urbanization and Sustainable Development and Priority Issues such as Poverty, Health, and Rural Development.<sup>9</sup>

The UNU joins GEA in the recommendation that in order to implement new approaches to sustainable development, urbanization must be connected to such issues as poverty, the environment, health and urban - rural linkages.

Further, urban ecosystem assessments must become part of urban action plans as they link the 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, focus on the ability of cities to provide the environmental/ecological services needed for human well-being. These assessments will facilitate an integrated and multi-scale examination of urban activities and their impacts and therefore be vital to decision-makers at all levels.

In collaboration with a number of scholars and UN agencies (WHO and UNESCO/MAB), the UNU/IAS is leading an effort to undertake urban ecosystem assessments as part of the Millennium Ecosystem Assessment. The assessments will operate in ways commensurate with *Local Agenda 21*, as multi-stakeholder dialogues and public participation will be important components.

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Key Finding SEVEN: Promotion of Information Communication Technologies are Critical for Environmental Education and Conservation

As governments struggle to meet their reporting obligations, for example, under international conventions, they recognize the need for harmonization and rationalization of reporting requirements. New avenues are opening for preparing and presenting information in formats that are 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 their sustainable development efforts. The

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<sup>9</sup> Peter J. Marcotullio, "Asian Urban Sustainability in the Era of Globalisation," *Habitat International Journal of the Study of Human Settlements*, 25(4), 2001, 577 – 498; Peter J. Marcotullio, Awais L. Piracha and Caroline King, "Overview of Urban Ecosystems: Towards an Assessment Framework," *UNU/IAS Working Paper*, Tokyo, 2001; Fu-chen Lo and Peter J. Marcotullio, eds., *Globalisation and the Sustainability of Cities in the Asia Pacific Region*, Tokyo: UNU Press, 2001.

educational value of scientific and policy inputs to decision-making and here again information technologies are increasingly bridging the gap between policy and education. This has the additional bonus of 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.

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 Asia. This should not be a case of "grow now, clean later" but "grow a clean industrial structure now" and share knowledge in the process.

The UNU is implementing a number of projects under the theme of ICT and the Environment. These include projects on information harmonization for national reporting on multilateral environmental agreements, exploratory research on the impact of ICTs on the environment, and an exciting initiative called the UNU Virtual University.

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Key Finding EIGHT: “ZERO Emissions” Strategies are a Practical and Economically Efficient Path to Sustainability<sup>10</sup>

Strategies such as the Zero Emissions concept, which advocate all industrial inputs being used in final products or converted into value-added inputs for other industries or processes, are practical methods to achieve greater environmental sustainability. Such strategies could be implemented by reorganizing industries into clusters such that each industry's wastes / by-products are fully matched with the input requirements of another industry, and the integrated whole produces no waste of any kind. National governments should, with the cooperation of industry, sponsor feasibility studies to determine what sectors could most benefit from application of Zero Emissions. In some cases, national investment in R&D 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.

For more information please contact: The Zero Emissions Forum, Environment and Sustainable Development, United Nations University, Tel: +(81-3) 5467-1250 Fax: +(81-3) 3406-7347, Email: [unu-zef@hq.unu.edu](mailto:unu-zef@hq.unu.edu)

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<sup>10</sup> See <<http://www.unu.edu/zef/>>, <[http://www.ias.unu.edu/research\\_prog/unuzeri/research.html](http://www.ias.unu.edu/research_prog/unuzeri/research.html)>

Key Finding NINE: Promotion of Best Practices on Agrodiversity through Local Knowledge is a Key to Biodiversity Conservation.<sup>11</sup>

Biodiversity exists largely in landscapes that are managed for agriculture and rural livelihoods. 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 policy makers. 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 agrodiversity, 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.

For more information about the Population, Land Management, and Environmental Change (PLEC) programme please contact Mr. Luohui Liang at [liang@hq.unu.edu](mailto:liang@hq.unu.edu) or visit the PLEC homepage at <http://www.unu.edu/env/plec/>

Key Finding TEN: Creation and Implementation of Strategic National Frameworks for Sustainable Development Frameworks are Required<sup>12</sup>

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 the 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

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<sup>11</sup> United Nations University Report, *PLEC Progress Reports*, Tokyo: UNU, 1999-2001 <<http://www.unu.edu/env/plec/documents.html>>; Harold Brookfield, *Exploring Biodiversity*, New York: Columbia University Press, Forthcoming 2002; Juha I. Uitto and Akiko Ono, *Population, Land Management and Environmental Change*, Tokyo: UNU Press, 1996, Special Edition *Global Environmental Change*, 5(4), London: Butterworth-Heinemann, September 1995. This special issue of GEC was dedicated solely to PLEC Research.

<sup>12</sup>Fu-chen Lo and Yu -qing Xing, eds., *China's Sustainable Development Framework*, Tokyo: UNU/IAS, 1999; T. Palanivel, "Sustainable development of China, India and Indonesia: Trends and Responses", *UNU/IAS Working Paper*, Tokyo: UNU/IAS, 2001.

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.

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<sup>i</sup> For a list of major regional MEAs in Asia and the Pacific, see UNEP (2000).