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Institute of Advanced Studies

# ADVANCED PERSPECTIVES

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## Sustainable Future of the Global System

*"It is for the global community of scholars, and it also the mandate of the United Nations University, to promote a long-term view of development processes..."*

*Professor Hans van Ginkel,  
Rector, United Nations University*

Following the 1992 Earth Summit, the issue of sustainable development has been high on the world's agenda. To clarify the scope of the concept and to discuss the highly complex and interdependent issues that constitute it, the second International Conference on Sustainable Future of the Global System was jointly organized by the UNU/Institute of Advanced Studies (UNU/IAS) and the Institute for Global Environmental Strategies (IGES), with support from the Environment Agency of Japan.

Well over 400 participants gathered at the UNU Headquarters in Tokyo on 23-24 February 1999 to listen to 40 leading international experts address a wide range of issues — including climate change, tradable permits, sustainable production and consumption, energy, food security, natural resource depletion, and degradation of agricultural and forested land — from a variety of academic disciplines and perspectives.

The experts were drawn from universities, research institutes, and international agencies around the world to participate

as speakers and panelists. Among these, several UN agencies were represented, including the United Nations Develop-

posed the question: "What, exactly, is 'sustainable development?'" Citing the the Brundtland Commission's report, he



ment Programme (UNDP) and the Food and Agriculture Organization (FAO).

The Conference was divided into seven sessions that centered on three main themes:

- Key policy issues arising from the Fourth Conference of the Parties (COP4) of the Framework Convention on Climate Change held in Buenos Aires in November 1998. Topics addressed included progress in multilateral efforts to reach a global accord and alternative emission scenarios.
- Sectoral issues relating to sustainable development, ranging from energy and natural resource management, to sustainable production and consumption.
- Overview of sustainable development in China and other large developing countries with the aim of creating a policy framework in which to analyse issues of sustainability.

### UNU Rector Opens the Conference

In his Opening Remarks, Professor Hans van Ginkel, UNU Rector, reminded the audience of the definitional challenges related to the issue of sustainability. He

defined sustainable development as meeting "the needs of the present generation without compromising the ability of future generations to meet their own needs." Although advancing this well-accepted definition, he acknowledged that the concept of sustainability and its various components will continue to be the object of much critical inquiry and debate.

Professor van Ginkel commented on the UNU's efforts to serve as an international forum through which in-house researchers, together with an international network of scholars and institutions, may better articulate the meaning of sustainable development. In this regard, he recognised that, in the end, the conference may raise more questions than answers. Indeed, one of the objectives of the Conference was to further examine the sustainability challenges so that follow-up research efforts can contribute effectively to this important global cause.

### The Keynote Address

Robert T. Watson, Chair of the Intergovernmental Panel on Climate Change

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Robert Watson, Chair of the Inter-Governmental Panel on Climate Change delivers the keynote speech on "Key Issues at the COP4 and the Future."

(IPCC), gave the keynote speech. He recalled that one of the major challenges facing humankind is to provide an equitable standard of living for this and future generations stating that "today more than 1.3 billion people live on less than \$1 per day and 3 billion people live on less than \$2 per day, 800 million people are malnourished, 1.3 billion people live without clean water, 2 billion people live without sanitation, 2 billion people live without electricity, and 1.4 billion people are exposed to dangerous levels of outdoor air pollution leading to millions of premature deaths each year. These unfulfilled needs for a clean and healthy environment kill millions of people prematurely each year."

Furthermore, he argued, global environmental degradation is a threat to sustainable development. In particular, addressing the issue of global warming, he explained how governments cannot wait for the causes and effects to be definitively established because the time to reverse the damage could take centuries. Dr. Watson then explained the central issues raised at the Fourth Conference on the Parties (COP4) to the Climate Change Convention and their implications for the sustainable future of the global system.

He concluded his speech noting that policymakers will have to decide to what degree they want to take precautionary measures by mitigating greenhouse gas emissions and enhancing the resilience of vulnerable systems by means of adapta-

tion. In his view, delaying such measures may leave individual countries poorly prepared to deal with adverse changes and may increase the possibility of irreversible or very costly consequences.

#### Key Issues Arising Out of COP 4

Session II of the conference was co-chaired by Professors Tarcisio Della Senta and Fu-chen Lo of UNU/IAS. The first part dealt with permit trading under the Kyoto Protocol and began with an address from Warwick McKibben of the Australian National University. Professor McKibben stated that his research, using a global economic model, has shown that if the Kyoto Protocol can be made binding there is likely to be "a reduction in greenhouse gas emissions at relatively low cost if permit trading is implemented and if all countries participate."

The next speaker was Nebojsa Nakicenovic from the International Institute for Applied Systems Analysis (IIASA) who presented the findings of a five-year study on long-term global and regional energy perspectives. Using a model developed by IIASA and the World Energy Council, Dr. Nakicenovic analysed the interaction between the requirements of the Kyoto Protocol and the likely energy changes in the Eurasian regions.

The panel discussions that followed addressed the state of multilateral efforts related to the Kyoto Protocol in the context of the COP4 meeting in Buenos Aires. The panelists commented on the

important role of modelling (including the OECD's GREEN model) in analysing the potential of states to meet their commitments under the Protocol.

#### Sustainable Development Framework for Developing Countries

After the overview of global environmental change presented in Sessions I and II, the Conference shifted its focus to address the national implications of sustainable development with particular reference to large countries. Session III was chaired by Akio Morishima, Director of IGES, and began with a noteworthy contribution by Professor Lo on the on-going project at UNU/IAS entitled *Sustainable Development Framework: The Case of China*. Professor Lo addressed various aspects of sustainability in an integrated manner by placing them in the context of demographic changes, economic growth, and the environment.

As 85 percent of the world's future population will reside in developing countries, it becomes more imperative than ever for such countries to economically develop without further deteriorating the environment and depleting natural resources. Towards this end, UNU/IAS has taken the initiative by launching a project to develop an integrated sustainable development framework for China to support policy analysis and strategic planning. Co-ordinated by Prof. Lo, the project is being undertaken by a team of UNU/IAS in-house researchers, together with a network of institutions and scholars from China.

During Session III of the Conference, project members from both UNU/IAS and Chinese institutions presented a Summary Report that highlighted their initial research findings. It is hoped that the case of China is but the first articulation of a sustainable development framework, with research focusing on other large developing countries, including Indonesia and India, now in the planning phase.

#### Energy Outlook and Policy Issues

Session IV was held on the second day of the Conference and chaired by Shuzo Nishioka of the National Institute for Environmental Studies. Two presentations were made by James Edmonds of the Pacific Northwest National Laboratory and Jayant Sathaye from Lawrence Berkeley National Laboratory. Dr. Edmonds dis-



Professor Lo chairs part one of the Session II on Climate Change - Alternative Scenarios and Policy Assessment.

cussed the need for a global energy technology strategy to address climate change. He highlighted the importance of energy-related research and development, and was concerned that expenditure in this area is on the decline internationally (with the exception of Japan and Switzerland). For instance, between 1985 and 1995, public funding for energy R&D in the USA, Germany, Italy and the United Kingdom dropped by 9%, 74%, 74% and 88% respectively.

Dr. Sathaye presented a number of carbon emission scenarios for Asian developing countries. His research findings illustrated that future energy/GDP growth rates in many Asian countries may be lower than historical ones. This can be explained by anticipated changes in the economic structure as service industries become dominant and also by changes brought about as a result of energy efficiency programmes. However, future alterations in the energy fuel mix could impact on CO<sub>2</sub> emission growth rates as some countries switch to carbon-intensive fuels such as coal and oil. He concluded that emission reductions beyond specified baseline scenarios is possible mainly for those countries most endowed with natural energy resources, but that there could be significant cost implications in some cases.

### **Sustainable Production and Consumption**

Session V, chaired by Kirit Parikh of the Indira Gandhi Institute of Development Research, explored various issues related to the 1998 UNDP Human Development Report and began with a presentation from Robert Ayres on the *Material*

*Implications of Sustainability.* This was followed by a paper from Sakiko Fukuda-Parr of the UNDP on *Consumption, Environment and Poverty* highlighting the inequitable distribution of consumption and per capita CO<sub>2</sub> emissions. She explained how the UNDP had found that poor people and poor countries bear many of the costs of this unequal consumption. Various measures are therefore required in order to tackle the issues head on. These include, amongst others, the removal of *perverse subsidies*, the imposition of environmental taxes and creation of alliances within civil society to promote consumer rights, environmental protection, poverty eradication, gender equality, and children's rights.

The next speaker, Michael Lipton from Sussex University, explored this topic further from a demographic perspective. He argued that the mass consumption society poses policy problems, not only of the sustainability of producing the increasing amount of consumer goods and in terms of the actual distribution of these goods, but also of perceived inequality.

### **Natural Resource Management**

Motoyuki Suzuki, Vice Rector of the UNU, chaired Session VI which included speeches from Nikos Alexandratos of the FAO, Guenther Fischer from IIASA and Matti Palo of the Finnish Forest Research Institute. Collectively, they explored the interactions between land use, agriculture and food security, deforestation and carbon sequestration.

Dr. Alexandratos explained how, at least in the medium term, there appear to be no major global constraints to expanding

world food production at a rate sufficient to match the growth in demand. Moreover, employing sophisticated modelling techniques, Dr. Fischer explained that IIASA has been able to show that global resources (land, water and biological) are sufficient to meet the needs of future generations. These resources, however, are unequally distributed and vulnerable in many locales.

Finally, the issue of deforestation and its relationship to climate change was addressed by Dr. Palo. He showed how the forest area will decrease between 1990 and 2025 by 29-39% in Latin America, 37-41% in Africa, and 31-36% in Asia. While, noting that the rate of deforestation is declining, he raised concerns about the actions of the main deforesting countries and on the need for South-North cost sharing of joint implementation reforestation projects. The data and analysis included in Dr. Palo's presentation are further elaborated in a recent book publication entitled *World Forests, Society and Environment.* The book is available from Kluwer Academic Press and presents the findings of a UNU/IAS funded research project.

### **UNU as International Forum for Global Modelling and Research**

Beginning with its first conference on the Sustainable Future of the Global System in 1995, the UNU has served as an international forum in which scientists and practitioners may better articulate what is meant by 'sustainable development.' This includes consideration of the contentious issues that constitute it; the problems that these issues present to the world community, particularly to developing countries; and how these problems might best be addressed by advancing alternative policy options.

This second international conference, therefore, represented an attempt to build upon earlier efforts, while reaffirming the UNU's commitment to addressing the pressing global issues of sustainable development.

## Trade, Industrialization and the Environment in Asia-Pacific

*"The Asia-Pacific region has seen unprecedented changes in economic growth and trade in the last couple of decades. This growth involves great increases in the use of resources, including energy and other materials, and this has led to tremendous impacts to the regional as well as the global environment."*

*Professor Fu-chen Lo, Deputy Director, UNU/IAS*

### The New Industrial Manufacturing Belt

Structural transformations in the last quarter of this century have resulted in the formation of a new pattern of international division of labor. The OECD countries have seen their industrial base increasingly concentrated in the service and tertiary sectors, while newly industrializing economies (NIEs) of the Asia-Pacific region have been expanding manufacturing production very rapidly. In other words, the global industrial belt has gradually shifted from the OECD countries to the Asia-Pacific Region. Relocation of the manufacturing sector has also become evident within the Asia-Pacific region, where the ASEAN countries and China have emerged as competitive centres for manufacturing following the Asian NIEs. Their unprecedented high economic growth has promoted structural interdependencies among the economies of the Asia-Pacific region through trade and foreign direct investment.

Continuing high economic growth in Asia is, however, causing serious environmental problems. Considerable increases in energy consumption in the future are anticipated in the developing part of the Asia-Pacific region, notably in China and ASEAN countries. Water shortages, deforestation, and water and air pollution are becoming more and more serious in Asia as a whole. These problems, if left alone, pose a serious threat to not only sustainable growth in Asia but to the global environment. International assistance and concerted action are needed to counter the negative effects of economic growth. It is thus essential to carefully analyze industrialization and trade expansion in Asia and the environmental conse-

*Yoichi Nakamura, and Katsuki Oda, "Green GDP of Japan for 1985 and 1990: Trial Estimates of Integrated Environmental and Economic Accounting," UNU/IAS Working Paper No.8, June 1996.*

*Takahiro Akita, Fu-chen Lo, and Yoichi Nakamura, "Interdependence and Growth in the Asia-Pacific Region: An International Input-Output Analysis," UNU/IAS Working Paper No.29, June 1997.*

*Takahiro Akita, "An Environmental I-O Structural Decomposition Analysis of Chinese SO<sub>2</sub> Emissions: A Comparison with Japanese Emission Levels," UNU/IAS Working Paper No.55, August 1998.*

*Takahiro Akita, "Trade and SO<sub>2</sub> Emissions: An International Environmental Input-Output Analysis Between China and Japan," February 1999.*

*Yoichi Nakamura, "Transfer of Costs of Air Pollution through Trade between Japan and Asia," February 1999.*

*Armida S. Alisjahbana, "Trial Estimates of the 1990 Indonesian System of Integrated Environmental and Economic Accounting," February 1999.*

*Lei Ming, "Integrated System of Environmental and Economic Accounting of China," February 1999*

#### Box 1: Related Research Publications

quences. It is also necessary to assess the region's future development potential subject to the capacity of the global environment.

#### UNU/IAS Initiative

Against this background, the UNU/IAS project on Trade, Industrialization and the Environment (TIE) was initiated in 1997 as part of the UNU/IAS Programme on Eco-Structuring for Sustainable Development. The project measures the environmental impacts resulting from industrialization and trade in Asia, especially China, Indonesia, and Japan, within a framework that illustrates the interactions between the economy and the environment. The project, implemented through the International University of Japan (IUJ) involves a network of researchers from academic institutions in China, Indonesia, and Japan, including Peking University (China), Padjadjaran University (Indonesia) and Reitaku University (Japan).

The first phase of the project examined, using the Asian international input-output

(I-O) tables, the changing patterns of trade and interdependence in the Asia-Pacific region. According to the I-O analysis, the United States has played a significant role in the region as a market for manufactured goods, especially final goods, whereas Japan has been fundamentally important in strengthening the manufacturing base of China, the ASEAN4 (Indonesia, Malaysia, the Philippines, and Thailand), and the Asian NIEs by exporting capital and intermediate goods to them.

According to the 'revealed' comparative advantage indices, China was very similar to the ASEAN4 as both had a strong 'revealed' comparative advantage in agriculture, agro-based, and labor-intensive industries. Thus, there was a great deal of intra-industry trade between them. The NIEs were very similar to Japan in their pattern of 'revealed' comparative advantage, with both being advantageously placed in the capital-intensive industries. They were thus regarded as complementary to China and the ASEAN4. The Unit-

ed States was situated in between these two sets of economies and unique not only in the pattern of 'revealed' comparative advantage but also in the structure of industrial linkages.

### **Trade and the Environment: An International Environmental I-O Analysis**

Drawing upon the results obtained from the first phase, the second phase of the project involved the construction of an international environmental I-O model for the Asia-Pacific region to examine the environmental consequences of industrialization and trade. It has also estimated the System of Integrated Environmental and Economic Accounting (SEEA) for China and Indonesia and their environmentally adjusted domestic product (Green GDP).

An international environmental I-O analysis, which was conducted to analyze the linkages between trade and the environment for China and Japan, combined the following two I-O tables. The first is the Asian International I-O Table (constructed by the Institute of Developing Economies). The second is the Energy and Environmental I-O Table of China and Japan (constructed by the Ministry of International Trade and Industry of Japan in collaboration with researchers from the Keio University and the Chinese Government).

An international I-O table is a multi-country I-O transactions table that describes not only inter-industry transactions within countries but also industry by industry trade flows between countries. In an environmental I-O table, on the other hand, pollution emissions are linked to industrial output. The results showed that China emits about 18 million tons of SO<sub>2</sub> every year, whereas Japan emits only one million tons. Also, China's SO<sub>2</sub> emissions are 18 times higher than Japan's emissions. Since China's GDP was 355 billion US dollars in 1990, China emitted 50 tons of SO<sub>2</sub> per one million dollars of GDP, which was much larger than 0.4 tons for Japan. Adjusting the GDP figures by the purchasing power parity reduces China's SO<sub>2</sub> emissions per one million dollars of GDP to 10 tons, but the difference is still very large.

In China, the industrial structure of pollution emissions differs markedly from the

structure of outputs. For example, the electricity and water supply sectors, with an output share of only 1.8 percent, account for about 40 percent of total industrial SO<sub>2</sub> emissions, thus giving a very high SO<sub>2</sub> emission coefficient (the ratio of SO<sub>2</sub> emissions to output). The existence of a large number of thermal-inefficient, small-scale, coal-fired power plants, together with the lack of sulphur removal equipment, contributes to this high SO<sub>2</sub> emission coefficient. In Japan, on the other hand, the electricity and water supply sectors account for about 15 percent of total industrial SO<sub>2</sub> emissions, since it removes much of SO<sub>2</sub> is removed by desulfurization equipment.

According to the international environmental I-O analysis for China and Japan, the expansion of trade between these countries was found to be conducive to the reduction of overall SO<sub>2</sub> and CO<sub>2</sub> emissions. For example, 50 percent increase in the trade between China and Japan would reduce SO<sub>2</sub> and CO<sub>2</sub> emissions by 75 thousand tons and 8 million tons, respectively, as a whole. This would result from the fact that, in China, very pollution intensive domestic goods are replaced by imported goods that are produced by Japanese production technologies.

### **Estimation of Green GDP for China and Indonesia**

Conventional national accounts as indicators of the assessment of economic performance have neglected the scarcities of natural resources that threaten the sustained growth of the economy on the one hand and the degradation and destruction of the environment due to economic activities on the other. In order to cope with these drawbacks, the United Nations and the World Bank have been working on the development of alternative macro-indicators of environmentally adjusted and sustainable income and products. As a result of this effort, the Statistical Division of the United Nations (UNSTAT) published a System of National Accounts (SNA) handbook in 1993 to provide a conceptual basis for implementing a satellite System for Integrated Environmental and Economic Accounting (SEEA) and environmentally adjusted domestic product (Green GDP) that illustrate the interrelationships between the natural environment and the economy.

In response to the recommendation of the United Nations, the Economic Planning Agency of Japan (EPA) released in 1995 its first estimates of the Japanese SEEA and Green GDP for 1985 and 1990. In 1998, the EPA revised its estimates for 1985 and 1990 and extended the period to 1970-90. According to the EPA's estimates, Green GDP, which is defined as the difference between net domestic product (NDP) and imputed environmental costs (depreciation allowances for non-produced natural assets due to economic activities), was 363 trillion yen in 1990, which was about 98.9 percent of NDP (367 trillion yen). In other words, the imputed environmental costs accounted for only 1.1 percent of NDP. These imputed environmental costs, as proportion of NDP, decreased gradually from more than 8 percent in 1970 to about 1 percent in 1990 in Japan.

Following the estimates of Japanese SEEA and Green GDP, the project has attempted to estimate SEEA and Green GDP for China and Indonesia. According to the preliminary estimates, the imputed environmental costs accounted for 6.4 percent and 9.1 percent of NDP in China (in 1992) and Indonesia (in 1990), respectively. In Indonesia, forest damage (e.g., forest fire) and forest conversion contributed most to the total imputed environmental costs (about 46 percent). In China, imputed costs associated with water and air pollution amounted to more than 40 percent of the total imputed environmental costs. These results clearly indicate the characteristics of environmental problems in China and Indonesia.

In the future, UNU/IAS is planning to organize seminars and publish monographs to disseminate findings from this research project. It is anticipated that this project will provide a framework for future studies on trade, industrialization, and the environment including the Quartz Industrial Trade System project (pages 6-7 of this newsletter).

*Professor Takahiro Akita  
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# Industrial Trade Systems and Life Cycle Assessment

*“Through more efficient production processes, preventive strategies, cleaner production technologies and procedures throughout the product life cycle, hence minimizing or avoiding wastes, the policies and operations of business and industry, including transnational corporations, can play a major role in reducing impacts on resource use and the environment.”*

Chapter 30, Agenda 21

## 20th Century Trade and Industry Model

The global economy is composed of an extensive and intricate network of industrial trade systems. These systems cover the entire range of activities from investment in land development and exploration, natural resource exploitation, materials processing, product manufacture and marketing, transportation and distribution, utilization, product recycling and final waste disposal. Industrial trade systems cross national boundaries linking developed and developing countries in a vast production and consumption cycle.

As mentioned in the previous article on trade, industrialization and environment in Asia, at present, these systems are in the most part environmentally unsustainable. For instance, in some cases they may involve environmentally unsound resource exploitation practices in developing countries that are largely disassociated from the high tech products manufactured in the industrialised world. Likewise, there are cases where the hazardous wastes from a manufacturing process are exported across national boundaries and disposed off in methods far below international best practice.

In general, our understanding of these trade systems is limited. This is because they are complex and open making it almost impossible to define system boundaries and to isolate, for instance, the environmental effects of a particular industrial process. Moreover, we tend to feel more comfortable examining the various components of the system rather than as a whole. Consequently, researchers will look at ways to “green” investment programmes. Others will focus on how best to clean the production process or on methods for waste minimization. As such, an appreciation of how the entire system operates is lost.

## A New Initiative from UNU/IAS

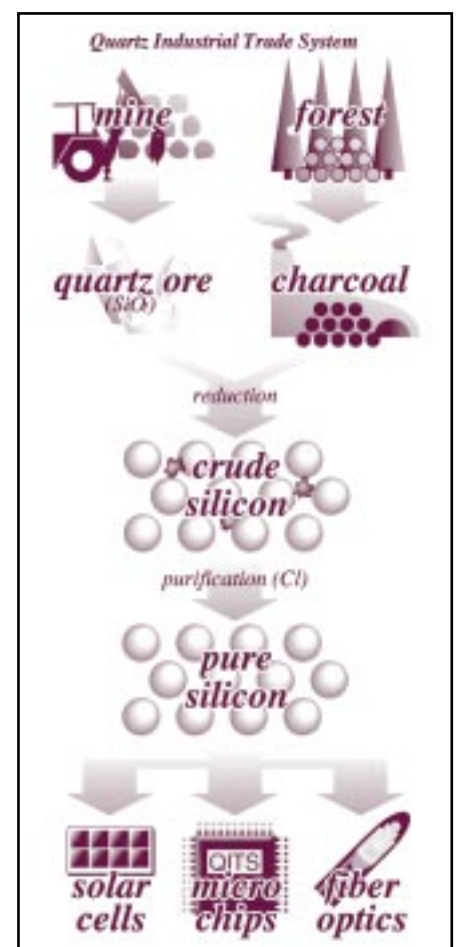
In January 1998, UNU/IAS launched the Quartz Industrial Trade System (QITS) project to examine eco-restructuring for sustainable development through a multi-faceted case study of a specific industrial sector. The system under consideration includes a cluster of industrial processes producing high-tech silicon based products, focusing on microchips, solar cells, and fibre optics. These are all important industries with respect to the future development of humankind.

Microchips and fibre optics form the backbone of the information technology sector which continues to transform modern societies. Likewise, solar power is expected to be a key technology in providing clean and environmentally safe energy for the future. It is highly likely that demand for microchips, fibre optics and solar cells will continue to rapidly increase over the next decade and the longer term. Moreover, the appetite of this industrial system for valuable natural resources and the environmental impacts associated with processing these resources increases with the growth of demand. It is crucial, therefore, that we seek industrial development paths that minimize environmental impacts and maximize the utilization of materials and energy.

The Quartz Industrial Trade System (see box 2) begins with the extraction of quartz, which contains silicon in the form of silicon dioxide, and production of charcoal or coal. Quartz and charcoal are converted into crude metallurgical silicon via reduction in an electric furnace. Brazil, China, Norway, and the United States are the main producers of metallic silicon destined for high-tech products. However, this metallic silicon, about 99% pure, does not meet the exacting requirements of high tech industry, so it is further purified via conversion to gaseous chlorinated compounds, from which pure silicon compounds are obtained through distillation and condensation. The final product has impurities in the parts per billion, but in the process nearly 80% of the metallic silicon input is wasted. Japan, the United States, and Europe are key players in the purification of silicon.

For the production of microchips and

most solar cells, the purified silicon is drawn into ingots and sliced into wafers. Most silicon for the manufacture of solar cells is actually supplied from rejected material from the microchip industry, as solar cell production need not meet as strict standards. This interdependency, however, is beginning to cause serious problems, as the demand for silicon in solar cell production has begun to exceed the amount easily supplied from the microchip industry.



Box 2: Overview of QITS

## A Sustainable Trade and Industry Model for the 21st Century

In QITS, the final high tech products are mostly manufactured in developed countries. As the previous description shows the system exhibits the basic technological, trade and economic interdependencies of most modern production systems. In this context, the main question

addressed by the QITS project is how the system, from a global, integrated perspective, can be analyzed with a view to the promotion of a positive move on the part of the key stakeholders towards environmental sustainability. In the UNU, this transformative process is referred to as "eco-restructuring" whereby a range of changes are required in order to create a new model of trade and industry which will take us into the next millennium.

The QITS project tackles this issue from a multidisciplinary perspective employing a range of analytical tools including Life Cycle Assessment (LCA). This is a tool employed extensively by business around the world and involves the comprehensive evaluation of the environmental effects associated with any given activity. Typically, an LCA will examine these effects from the initial gathering of raw materials to the point where these materials are disposed of. This evaluation normally includes consideration of all sidestream emission releases to air, water and soil.

Through the application of various tools, UNU/IAS will seek to develop a generic methodology for eco-restructuring of minerals-based industrial systems. This could then be further enhanced with the development of a model environmentally sound industrial system.

In pursuit of this goal, the QITS project includes three basic activities:

- Characterization and analysis of the industrial trade system including identification of significant trends and environmental issues.
- Identification and development of potentially significant alternative technologies and innovations that can be adopted in the field in order to ameliorate existing environmental problems.
- Networking and collaboration with government officials, researchers and businesses so as to facilitate increased information exchange and dialogue.

These activities are completely interdependent since a comprehensive characterization of the system is required in order to identify environmental "hotspots" and to formulate alternative technologies and techniques. The QITS project therefore pursues an integrated analysis of the system, which involves bringing together technological, economic, environmental, and social data so as to arrive at a richer

view on a sector-by-sector basis and for the entire industrial trade system. This is facilitated by a basic methodology which places emphasis on:

- Identification of Material Flows. This involves the utilization and extension of existing studies so as to identify the interdependencies within the manufacturing system and to provide an indication of what are the key environmental and economic issues.
- Economic Analysis. This will require examination of macro level trends in supply and demand for the various sectors in the manufacturing system, from material extraction and processing, to the production of products. In doing this, it is important to recognize interrelationships between sectors, such as the semiconductor and solar cell industries.
- Inventorizing and Evaluation of Existing and Emerging Technologies. This would involve cataloging alternative technologies and the application of LCA, as well as a review of the potential benefits of employing these technologies in the existing industrial trade system.

These three approaches will place emphasis on evaluating the system from an global viewpoint, since the production system is internationally distributed and research efforts into alternative technologies are being intensively undertaken in many parts of the world.

### **Incorporating a Zero Emissions Dimension**

The QITS project will draw upon and further enhance the work of UNU/IAS in relation to Zero Emissions. The Zero Emissions approach was launched by the UNU in 1994 and promotes the utilization of wastes outputs from one process as inputs for other processes. This can best be achieved through the clustering of industries based on their input and output requirements. In identifying potential measures to improve environmental performance within the system, the QITS project team will focus on cataloguing existing major technologies and estimating possible effects on the economic and environmental aspects. In addition, the development of pilot alternative technologies will be carried out in collaboration through an international network of researchers.

Currently, two pilot technologies are under consideration. The first involves an

investigation of the potential utilization of plasma technology in silicon processing. The application of this technology is being examined independently at the University of Tsukuba and at the University of Sao Paulo in Brazil. Second, a Zero Emissions technology is being developed in collaboration with the Latvian State Institute of Wood Chemistry and the University of Campinas in Brazil. This involves feasibility studies on the potential replacement of charcoal from wood with charcoal made from agricultural wastes. Experiments are being carried out on sugar cane bagasse, an underutilized leftover from the sugar cane industry. If feasible, substitution of bagasse charcoal could increase the utilization of wasted agricultural plant matter and reduce the need for logging forests to make charcoal.

### **Work in Progress**

Since the launch of the QITS project over a year ago, a number of important tasks have been completed. For example, two international workshops on QITS were held in 1998, one in March in Campinas, Brazil and the other in October in Tokyo, Japan. Proceedings from the first workshop were published by UNU/IAS in fall of 1998 and contain much information key to the characterization of the Quartz Industrial Trade System. Copies are available from UNU/IAS on request. The feasibility studies for plasma reduction and charcoal made from bagasse were also initiated. The priorities for 1999 are three fold and include (a) preparation of a report describing the entire system (which will appear as a monograph), (b) continuation of the feasibility studies on the pilot alternative technologies and (c) expansion of the project research network.

Networking is an important component of the QITS project and to date an extensive network of researchers has been established. This has been accompanied by a number of measures to promote information exchange and dissemination to all interested parties including the establishment of a project website ([http://www.ias.unu.edu/research\\_proj/qits](http://www.ias.unu.edu/research_proj/qits)).

*Eric Williams  
Research Associate*

## Adjunct Professors and Staff News

At present, there are 12 adjunct professors at UNU/IAS. In every issue of this newsletter we plan to introduce two members of the adjunct faculty. This issue introduces Professors Yokota and Kawabe.

Professor Yozo Yokota has been informally associated with the UNU almost since it was first established in the 1970s. He currently teaches international economic law at Tokyo University, Faculty of Law and has been an Adjunct Professor at UNU/IAS for the past two years. In addition, he chairs the Study Group on the United Nations by the Japan Association of International Relations composed of students, academics and practitioners which meets once a month at UNU/IAS to discuss UN related topics.



*Professor Yokota*

His current research interests include examination of the relationship between development and human rights. He is looking at this issue from a practical perspective, focusing on the complex interface between major development projects and human rights problems. At the global level, these problems are compounded by the general failure of international law to keep pace with the changes affecting modern societies.

In Professor Yokota's view the analogy of trying to fight against viruses is most apt. He argues that existing international law cannot effectively regulate and control many development activities and the actions of transnational corporations (TNCs) because of the rapid speed of change and the way that, like viruses, TNCs are capable of quickly changing their form and appearance. In order to respond more effectively to the dramatic global changes, Professor Yokota would

like to see the evolution of international law given further impetus and a stronger role adopted by international organizations such as the UN.

This would need to be matched by the development of a "common law for mankind," which in turn should promote a set of universal values. Professor Yokota mentioned that he would like to see this universality expanded to cover modern science and learning in order to move away from the current situation where teaching is prejudiced in favour of certain countries and cultures.

In this context, the notion of universality should, in the view of Professor Yokota, be central to the research approach pursued by UNU/IAS. The Institute needs to examine and promote solutions to pressing global problems that are not necessarily specific to a given country or national interest, but are universal in their appeal.

We asked Professor Yokota his views on the UNU/IAS Ph.D. Fellowship Programme. In response, he indicated that he enjoys meeting with the Ph.D. Fellows and providing them with advice on issues of common interest. Generally, he feels that the standard of Ph.D. Fellows is very high and the topics of their research are interesting and original. Unfortunately, research by the Fellows on certain topics is difficult to pursue in Japan due to the lack of contacts or research materials. Consequently, Professor Yokota recommends that applicants for the fellowships should be careful about choosing UNU/IAS as the place to advance their research. In addition, he is of the view that eight months may be too short for many Fellows, particularly if their Japanese language capacity is limited. At present, the inability of the Fellows to speak Japanese severely restricts their opportunities to meet and fully interact with the Japanese academic community.

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Professor Takaya Kawabe is a specialist in plasma physics and nuclear fusion engineering. He is currently teaching in the Institute of Physics at the University of Tsukuba and works as a consultant to the Japan International Cooperation Agency (JICA) in the field of technology transfer. He has been an Adjunct Professor at

UNU/IAS for the past three years. Professor Kawabe is involved with two activities at UNU/IAS: the Plasma-Net and the Quartz Industrial Trade System (QITS) project. The former is an electronic mailing list providing direct support to scholars and practitioners in developing countries on scientific and technical issues related to plasma technology. Currently there are over 1,600 subscribers to the mailing list from 60 countries and it has developed into the largest international information network in this field.



*Professor Kawabe*

The QITS project is described on pages 6 and 7 of this newsletter. Professor Kawabe emphasized that this project has an important role to play in tracing the interconnections between and roles of developing and developed countries with respect to high technology. In particular, he is concerned that developing countries appear in some cases to suffer significant adverse environmental impacts associated with resource exploitation required to support technologies developed in the industrialized nations. To date, it seems that very little attention has been paid to fully comprehending the role of various trans-national industrial trade systems and their potential negative environmental ramifications. Professor Kawabe feels that UNU/IAS should take the lead in examining these systems and in the search for new technologies and techniques designed to bring about benefits for developing countries. Plasma technology may be one such example and is currently being applied to solve environmental problems in Japan related to dioxin emissions from garbage incineration. Professor Kawabe adds an important scientific dimension to the research work at UNU/IAS. When interviewed, he men-

...continued from page 8

tioned that he enjoys working in the multidisciplinary environment at UNU/IAS and that he considers that the Institute can play a key role in supporting scientists in developing countries. In particular, when considering the need to tackle pressing global issues, Professor Kawabe highlighted the problems which have occurred in the past whereby developing countries have been the main "givers" and developed countries have been the "takers" with regards to the world's natural resources. He feels that this process needs to be reversed in the 21st Century and that UNU/IAS should take the lead in accumulating knowledge on how best to "give" to developing countries. This would include measures designed to enhance technical and scientific capabilities in developing countries, as well as improvements in the higher education systems. UNU/IAS could become a centre of excellence in this area and the Institute's Virtual University project represents a powerful tool in this context.

The Institute's Ph.D. Fellowship Programme is another possible avenue that could be used to support scholars from developing countries. Professor Kawabe is concerned, however, that few of the successful candidates so far have come from a scientific background. This may reflect the fact that UNU/IAS does not have the appropriate facilities to support such scholars in terms of

laboratories and so on. This could be overcome to some extent, however, by the creation of stronger ties with scientific research institutes in Japan, including those based in the Tsukuba Science City.

#### Arrivals and Departures

Over the past few months, the academic community at UNU/IAS has gradually increased. Recent additions to our academic community are introduced below:

Dr. Nawalage Seneviratne Cooray joined UNU/IAS as a Research Associate in February 1999. Previously he was employed as a UN researcher at the United Nations Centre for Regional Development and as a Visiting Professor at Yokkaichi University. Dr. Cooray has a Ph.D. from the University of Nagoya in econometrics modelling and a MA in international economics from the International University of Japan. He has considerable teaching and research experience in the areas of sustainable economic development, macroeconomics and microeconomics, econometric modelling and applied statistics.

The following staff have recently departed from UNU/IAS or changed positions.

Dr. Peter J. Marcotullio has accepted a position as Assistant Professor at the University of Tokyo in the Faculty of Engineering, Department of Urban Planning. Peter

has been a Research Associate at UNU/IAS for the past two years. Starting March 1, he began teaching at the University of Tokyo and took up the position as Visiting Associate Fellow at UNU/IAS, retaining the responsibility of Managing Coordinator for projects in the Mega-cities and Urban Development Programme.

Dr. Jing Su, from the Government of China, worked at the Institute from August to October 1998. During that period he was a Visiting Research Associate and was extensively involved in the UNU/IAS project on the Sustainable Framework for China.

Dr. Chia-lung Lin from Taiwan was employed as a Visiting Research Associate from July 1998 to January 1999. Dr. Lin was responsible for drafting key sections of the project report for the Sustainable Framework for China.

Professor Eiji Hiranaka, former Senior Institutional Relations Officer at UNU/IAS, has taken up a teaching position at Shinshu University, Faculty of Economics in Matsumoto. Professor Hiranaka joined UNU/IAS in 1996 and was responsible for overseeing the interaction between UNU/IAS and the Japanese academic community.

*See Alumni News (page 11) section for more information on recent changes*

## Dr. Jose Israel Vargas visits UNU/IAS



Dr. J. I. Vargas

Dr. Jose Israel Vargas, UNU/IAS Board member, visited the Institute in March

this year. Dr. Vargas is a former Minister for Science and Technology of Brazil and is currently the President of the Third World Academy of Sciences.

In addition to having occupied senior posts in the Brazilian Government, he was the Vice-President of the UNESCO Executive Council from 1983-1987 and a member of the UN Advisory Committee on Science and Technology for Development from 1982-1986.

He is a specialist in chemical consequences of nuclear transformation, and science policy and planning. He has been awarded several Brazilian and foreign decorations and medals for his outstanding accomplishments.

During his stay at UNU/IAS, Dr. Vargas provided advice and guidance to researchers and senior academics on a number of on-going projects at the Institute. He also presented a lecture on March 2 in which he spoke on the role of "Science and Technology Policy in the Framework of Globalization of Economy."

Dr. Vargas, together with Sir John Kendrew and Dr. Michio Nagai, played an important role in the establishment of UNU/IAS. In 1989, he chaired the advisory committee of eminent scholars who defined the Institute's mission, general directions and multithematic orientation.

## Networking Young Scholars from Around the World

As part of its efforts to reduce the isolation of young scholars in developing countries, fellowships of eight months are offered by UNU/IAS to Ph.D. candidates to carry out their research in a subject area closely related to one of the following four current programme areas of the UNU/IAS. These are: (i) Sustainability and Development; (ii) Mega-Cities and Urban Development; (iii) Governance and Multilateralism and (iv) Science, Technology and Society. Applicants must be at an advanced stage of their Ph.D. dissertation with a research topic accepted by their home university. Successful applicants will carry out their research in Tokyo under the supervision of UNU/IAS faculty members and/or affiliated UNU/IAS network scholars.

Language proficiency in English is essential. Fellowship awards include a monthly stipend, subsidized accommodation at UNU/IAS, and a return ticket between Tokyo and the fellow's country of residence. Applicants from developing countries are particularly encouraged to apply.

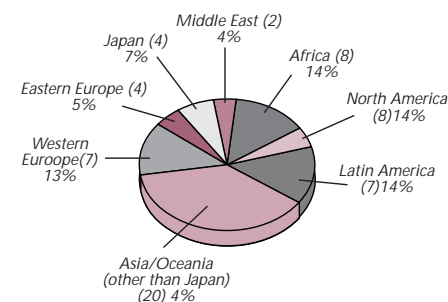
Fellowships commence in the winter, spring and fall of each year with the deadline of 21 August 1999 for the Fall (November) 1999 round. Application forms can be downloaded from the IAS homepage (<http://www.ias.unu.edu>), obtained by e-mail ([phdfellowship@ias.unu.edu](mailto:phdfellowship@ias.unu.edu)) or by writing to the address below. Candidates must complete an application form and provide the following documents: curriculum vitae, dissertation outline, supporting letter(s) of reference from Ph.D. supervisor(s) and academic record. Only completed applications will be considered.

For more details contact:  
Ph.D. Fellowship Programme  
United Nations University/Institute of Advanced Studies  
53-67, Jingumae 5-chome, Shibuya-ku,  
Tokyo 150-8304, Japan  
Fax: +81-3-5467-2324

As of April 1999, a total of 56 fellowships have been awarded. The majority of the successful applicants come from Asia/Oceania (excluding Japan), Africa,

the Middle East and Latin America (collectively constituting 68% of the fellows). A breakdown of the programme participants by region is shown in the figure below.

Presently, there are ten Ph.D. fellows resident at the Institute. A total of 46 fellows have completed the programme and 23 (50%) have already graduated from their home universities.



Ph.D. Programme Participants  
Regional Distribution (56 Fellows)

## Ten new Ph.D. fellows join the UNU/IAS Community

The ninth and tenth groups of Ph.D. Fellows joined UNU/IAS in October 1998 and February 1999 respectively.

Mr. Edgar Aragon from Mexico is a postgraduate student at Cornell University in the Department of City and Regional Planning. His research topic is "Globalization and Regional Development: A Case Study of Aguascalientes, Mexico." Mohammad J. Kuna is from the Department of Political Science at Nigerian Usmanu Danfodiyo University Sokoto Social Sciences. His research deals with "Violence and the Formation of States: The Case of the Postcolonial State in Northern Nigeria."

Mr. Changki Kwon from South Korea is a doctoral student at University of Southern California, School of Urban Planning and Development. He is undertaking research on "International Urban Development (Comparative Study of Urbanization)." Anoop Singh is a doctoral student at Indira Gandhi Institute of Devel-

opment in India. His topic is "Impact of Energy and Environmental Policy on Productivity and Growth." Jonathan R. Strand is from the Department of Political Science at American University of Nebraska-Lincoln. He is undertaking research on "Power, Representation, and Change in Multilateral Economic Institutions."

The tenth group is also composed of five scholars and includes Mr. Mahmoud El Zain Hamid from Sudan, a doctoral student at the Institute of Social Studies. His research topic is "Hydropolitics: Inter-State Competition over the Nile Waters and the Political Potential of the Recent Environmental Transformation in Egypt, Ethiopia and the Sudan."

Mr. Kanie Norichika is a postgraduate student at Keio University in Japan. His research deals with "Creating a Global Domestic Policy: Bottom-up Multilateralism in the Netherlands' Climate Change Policy."

Ms. Basak Koyuncu from Turkey is a doctoral student at University of Strathclyde. Her topic is "Central and Local Relationships: A Statement on the Impact of Social And Economic Structures on Local Autonomy."

Mr. Gergely Toth is a doctoral student at Pannon Agricultural University in Hungary. His research topic is "Agricultural Land Evaluation in Land Use Planning."

Mr. Pooya Alaedini from Iran is a doctoral student at Rutgers University. His research topic is "Manufacturing Investment, Technology Acquisition, and Industrialization in Developing Countries: The Case of Iran."

# New UNU/IAS Working Papers

Launched in March 1996, the UNU/IAS Working Paper Series presents results of the Institute's on-going research activities and also includes specially invited papers from leading international scholars. Recent papers completed at the Institute are presented below:

No.49 Olaf Unteroberdoerster  
Trade Liberalization and Environmental Quality in the Asia-Pacific - A Simulation

No.50 Punya Prasad Regmi  
Importance of Eco-Restructuring for the Sustainable Agricultural Development in Nepal

No.51 Felicity C. Rose  
Globalisation, Regionalisation and Chinese Cities: A Case Study of Shanghai's Integration into Global and Regional Urban-Economic Systems

No.52 W. Bradnee Chambers  
International Trade Law and the Kyoto Protocol: Potential Incompatibilities

No.53 Xianfu Lu  
Potential Impacts of Global Climate

Change on River Discharge in China

No.54 Eric D. Williams and Matthias Troyer  
A Framework for Computer Aided Modeling, Design, and Optimization of Integrated Industrial Systems

No.55 Takahiro Akita  
An Environmental I-O Structural Decomposition Analysis of Chinese SO<sub>2</sub> Emissions: A Comparison with Japanese Emission Levels

No.56 Marina Arlati  
The International Response to the Gulf Crisis (1990-91): Institutions, State Actors and Cooperation

In addition, from March 1999 UNU/IAS launched a new series of working papers under the Governance and Multilateralism Programme. The first two working papers under this series are:

No.1 Guido F.S. Soares  
International Trade and Environment: Confrontation between WTO/GATT and Environmental Protection Norms



No.2 Robert Hudec  
Trade and Environmental Policy in Developed Countries

Working papers can be ordered from the United Nations University, Institute of Advanced Studies, 53-67, Jingumae 5-chome, Shibuya-ku, Tokyo 150-8304, Tel: +81-3-5467-2323, Fax: +81-3-5467-2324. They can also be downloaded from the Internet at URL: <http://www.ias.unu.edu/>

## Alumni News

*Information on the activities of former UNU/IAS Ph.D. Fellows and researchers*

Dr. Achim Koerber, former Ph.D. Fellow, completed his final oral examinations in December 1998 and has been awarded a Ph.D. in economics from the University of Konstanz.

Dr. Martin Medina, former Ph.D. Fellow, recently became a registered consultant with the United Nations Office for Project Services UNOPS. He has also been appointed as a member of the Grants Advisory Committee for the University of California.

Anthony Aubynn, former Ph.D. Fellow, returned to Ghana in 1998 where he joined Abooso Goldfields Limited (AGL) as the Human Resources and Local Affairs Manager. AGL is currently the second largest gold producer in Ghana.

Dr. Xiaolu Wang, former Ph.D. Fellow, completed his degree at the Australian National University in 1998. Over the past year, Dr. Wang has provided consid-

erable support to the UNU/IAS project on the Sustainable Development Framework for China.

Dr. Kavi Kumar, former Ph.D. Fellow completed his doctorate in 1998. In February this year, he took up the position of Research Associate at the Institute of Economic Growth in Delhi, India. At the Institute he will continue to work in the area of climate change and modeling.

Dr. Raman Letchumanan, former Ph.D. Fellow, completed his Ph.D. at the University of Tokyo in March 1999. His doctorate thesis dealt with "Trade, Environment and International Competitiveness: Testing the Pollution Haven Hypothesis based on a New Trajectory of Technology Transfer." After a short spell working as a visiting research associate at UNU/IAS, he has returned to his position with the Malaysian Government.

Dr. Xianfu Lu, former Ph. D. Fellow, joined UNU/IAS in December 1998 as a visiting Research Associate for the 'China's Sustainable Development Framework' project.

She was intensively involved in the international conference on Sustainable Future of the Global System, organized jointly by UNU/IAS and IGES. While at IAS, she will help coordinate the Chinese counterparts and finalize the project report. In March 1999, she successfully finished her Ph.D. at the Commission for Integrated Survey of Natural Resources, Chinese Academy of Sciences.

Mr. Punya P. Regmi, former Ph.D. Fellow, recently published a paper in the international journal entitled *Outlook on Agriculture*. The paper was co-authored with Karl E. Weber and dealt with the topic of "Ecorestructuring: A Holistic Methodological Framework for Sustainable Agricultural Development."

Ms. Danielle Sepulveda, former Ph.D. Fellow joined the Institute in February 1999 as dissemination coordinator.

Ms. Shona Dodds, former Ph.D. Fellow, also joined UNU/IAS in February 1999 and is working in the Governance and Multilateralism Programme area.

## Seminars, Workshops and Conferences

7 January (Thu)

UNU/IAS Seminar on "State Power in Multilateral Contexts: Voting Strength in the Multilateral Development Banks, 1946-1996."

Mr. Jonathan Strand, UNU/IAS Ph.D. Fellow, University of Nebraska-Lincoln  
11:00-, UNU/IAS 1F Seminar Room

8 January (Fri)

UNU/IAS Seminar on "Trends of Environmental Cooperation in Northeast Asia: Progress to date"

Ms. Esook Yoon, UNU/IAS Ph.D. Fellow, University of Maryland  
11:00-, UNU/IAS 1F Seminar Room

13 January (Wed)

UNU/IAS Seminar on "Globalization and Regional Development: The Case of Aguascalientes, Mexico"

Mr. Edgar Aragon, UNU/IAS Ph.D. Fellow, Cornell University  
11:00-, UNU/IAS 1F Seminar Room

20 January (Wed)

UNU/IAS Seminar on "Housing Privatisation in Central and Eastern Europe: From Policy to Practice"

Ms. Natasha Pichler-Milanovich, UNU/IAS Ph.D. Fellow, London School of Economics and Political Science  
11:00-, UNU/IAS 1F Seminar Room

21 January (Thu)

UNU/IAS Seminar on "Reconstructing Reality: Foreign Workers and Secondary Associations in Japan"

Mr. Apichai Shipper, UNU/IAS Ph.D. Fellow, Massachusetts Institute of Technology  
11:00-, UNU/IAS 1F Seminar Room

2 February (Tue)

UNU/IAS Seminar on "Violence and the Formations of State: The case of the Post-colonial State in Northern Nigeria"

Mr. Mohammad Kuna, UNU/IAS Ph.D. Fellow, Usmanu Danfodiyo University  
11:00-, UNU/IAS 1F Seminar Room

4 February (Thu)

UNU/IAS Seminar on "The Political Economy of Spatial Development in East Asian NICs, 1960-1990"

Mr. Changki Kwon, UNU/IAS Ph.D. Fellow, University of Southern California  
11:00-, UNU/IAS 1F Seminar Room

11 February (Thu)

UNU/IAS Seminar on "The Role of Multilateralism and the UN in Post-Cold War US Foreign Policy: The Bush Administration and the Persian Gulf Conflict"

Ms. Shona E. H. Dodds, UNU/IAS Ph.D. Fellow

11:00-, UNU/IAS 1F Seminar Room

16 February (Tue)

UNU/IAS Seminar on "Vulnerability, Coping, and Access to Resources in Exile: The Case of Burmese 'Refugees' in Thailand"

Ms. Danielle C. Sepulveda, UNU/IAS Ph.D. Fellow  
11:00-, UNU/IAS 1F Seminar Room

22 February (Mon)

Informal Meeting on Land Use Change and Forestry (closed meeting)  
16:00-18:00, UNU/IAS 1F Seminar Room  
Supported by the Environment Agency of Japan

23-24 February (Tue-Wed)

International Conference on Sustainable Future of the Global System  
UNU HQ 3F International Conference Hall  
Supported by the Institute for Global Environmental Strategies

26 February (Fri)

UNU/IAS Lecture on "World Forests, Society and Environment"  
Prof. Matti Palo, UNU/IAS Project Director  
9:30-, UNU/IAS 1F Seminar Room

2 March (Tue)

UNU/IAS Lecture on "Science and Technology Policy in the Framework of Globalization of Economy"

Dr. Jose Israel Vargas, UNU/IAS Board Member  
15:00-, UNU/IAS 1F Seminar Room

9 March (Tue)

UNU/IAS Seminar on "Issues in Energy & Environmental Policy in India: Interfuel Substitution, Energy Efficiency, Energy Demand and CO<sub>2</sub> Emissions Reduction Options in Indian Industry"

Mr. Anoop Singh, UNU/IAS Ph.D. Fellow, Indira Gandhi Institute of Development Research/University of Bombay

30 March (Tue)

UNU/IAS Lecture on "Is Energy Crisis Armageddon or Prometheus for Development? Biomass Chemistry versus Oil Chemistry"

Dr. Hab. Chem. Janis Gravitis, UNU/IAS Visiting Professor  
11:00-12:30, UNU/IAS 1F Seminar Room

7 April (Wed)

UNU/IAS Seminar on "Investment, Privatization, and Technology Acquisition in

Developing Countries: The Case of Iran"

Mr. Pooya Alaadini, UNU/IAS Ph.D. Fellow, Rutgers, the State University of New Jersey

11:00-, UNU/IAS 1F Seminar Room

9 April (Fri)

UNU/IAS Seminar on "Agricultural Land Evaluation for Land Use Planning"

Mr. Gergely Toth, UNU/IAS Ph.D. Fellow, Pannon Agricultural University  
11:00-, UNU/IAS 1F Seminar Room

13 April (Tue)

UNU/IAS Seminar on "Interaction between Domestic Policy and Multilateral Diplomacy: The Case of the Netherlands' Kyoto Protocol Negotiation"

Norichika Kanie, UNU/IAS Ph.D. Fellow, Keio University  
11:00-, UNU/IAS 1F Seminar Room

12 May (Wed)

UNU/IAS Forum on "Financial Restructuring and Economic Perspective in the East Asia"

13:00-18:00, UNU HQ 5F

Supported by the Asian Development Bank Institute

25-28 May (Tue-Fri)

International Conference on "Toward a Science of Consciousness – Fundamental Approaches"

UNU HQ 3F ICH and 5F UCH

Supported by University of Arizona; Radford University; Notre Dame Seishin University

Advanced Perspectives is the newsletter of the Institute of Advanced Studies of the United Nations University (UNU/IAS). The Institute was established in December 1995 and inaugurated in April 1996. It conducts research and post-graduate education both in-house (involving its faculty, senior visiting fellows and Ph.D. fellows) and in cooperation with network of academic institutions and international organizations.

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