United Nations
Educational, Scientific and
Cultural Organization

G8-UNESCO World Forum

Education, Research and Innovation: New Partnership for Sustainable Development

web: g8forum.ictp.it

Forum Newsletter - Friday 11 May 2007 - No. 2

Editorial

by **Koïchiro Matsuura,** General Director, UNESCO

"We will promote the global innovation society by developing and integrating all three elements of the knowledge triangle (education, research and innovation)." We will do so "by investing fully in people, skills and research, and by supporting the modernization of education systems to become more relevant to the needs of a global knowledge-based society." That was the sentiment expressed by G8 leaders in a broad statement of intent which they endorsed at the G8 2006 Summit held in St. Petersburg, Russia last July. Ten months later, thanks to the generosity of the Italian government, the G8 and UNESCO have joined together to hold the G8-UNESCO World Forum on Education, Research and Innovation: A New Partnership for Sustainable Development. The Forum, which will take place from 10-12 May, will examine how to better utilize the synergies created by education, research and innovation as part of the larger global efforts now taking place to build a more prosperous, equitable and peaceful world. UNESCO, whose roots lie at the nexus between education, science and culture, is indeed honoured to be directly involved in the organization of this effort. We would like to thank the Abdus Salam International Centre for Theoretical Physics (ICTP) and the other members of the Trieste System for serving as hosts. We now live in a knowledge-based society where virtually every societal issue of consequence is directly linked to advances in science and technology. Think of a world without the internet? That world did not exist two decades ago. Yet today our global society could not function without electronic communications. Now think of a world without nanotechnology. Easy to do, you say. But that won't be the case 10 years from now, when products and services in fields as diverse as

CONTINUED ON PAGE 2

Riccardo Illy

President of Region Friuli Venezia Giulia

In his address during the opening ceremony of the Forum, President Illy thanked the G8, UNESCO and the Italian Government for having chosen Trieste, the "City of Science", and Friuli Venezia Giulia, the "Region for Innovation" for this event. Illy reminded the audience that Trieste is host to a hundred or so scientific and technological institutions (public and private) involving more than 8,000 people between the University and 4 scientific and technological parks, through which innovation in the entire Friuli Venezia Giulia region is being supported. "We believe that development occurs via innovation, and there cannot be innovation without research activity", said Illy. For this reason, the Region is investing a lot in research, education, professional training, the transfer of knowledge and innovation. It is therefore no coincidence that a recent survey of the Emilia-Romagna Region (2006 data) placed Friuli Venezia Giulia first in Italy in terms of quality of human capital. But there cannot be sustainable development without particular attention to the issue of energy, said Illy. For this reason, last week a regional energy plan was approved, which foresees measures - also to be supported financially - in favour of energy saving, the search for alternative and renewable sources and for the promotion of these renewable sources. However, in view of the fact that results cannot be obtained until the medium to long term, in the short to medium term it will be necessary to continue to rely on fossil resources, or at least the least polluting of them, therefore gas, in particular. "I therefore believe that Italy's choice to concentrate on gas for the production of electricity is the right choice. Consequently, in order to make this resource available, we believe in the construction of gas pipelines and regassification terminals - obviously in compliance with environmental legislation - which permit our country and Friuli Venezie Giluia to import the quantity of gas necessary."

FROM PAGE 1

Science, Technology and Innovation for all

facial cosmetics and water filtration systems are likely to be revolutionized by the ability of scientists and technicians to construct physical and biological structures one atom and one molecule at a time. But it's not just broad advances in frontier areas of science and technology that will continue to define who we are and how well we live. Equally significant is how we choose to use the knowledge we create. The key is to generate knowledge, not just for its own sake, but also for the sake of spurring innovation ? and then applying at least a portion of that innovation to addressing critical human needs. After all, we not only live in a world of unprecedented change, driven largely by science and technology, but also in a world of vast inequality and crushing poverty. Science and technology will only be able to fulfill their unlimited potential for social good when they not only broaden the horizons of the world of discovery but also confront the stark reality of everyday life for the one billion people who live on less than US$1 a day and who suffer disproportionately from malnutrition, disease and despair. Science and technology, therefore, must not only be used to satisfy human curiosity They must also be used to help satisfy the basic needs of our most marginalized citizens. Achieving this goal requires us to focus on promoting reforms in several fundamental aspects of society. First, there is a need to achieve high quality basic education, literacy and gender equality across the globe and especially among the world's poorest nations. Second, there is a need to build and sustain human and institutional capacity for science, technology and innovation, especially among the world's most scientifically and technologically impoverished nations. Third, there is a need to protect and promote indigenous knowledge, most notably as invaluable contributions to global efforts to advance public health, biodiversity and sustainable development. Fourth, there is a need to embrace knowledge as a public asset and to make it accessible to all. Knowledge acts as a powerful lever in the fight against poverty, misunderstanding and suspicion. Therefore any barriers that stand in the way of sharing knowledge stand in the way of progress. And, fifth, there is the need to nurture broad institutional networks where information is freely exchanged. Such networks, which have become ever-easier to create and sustain thanks to the explosive growth of the internet, are designed to be horizontal, not hierarchical in nature and, as a result, tend to encourage cooperation among equals instead of 'benevolent' information flows from the 'haves' to 'have-nots.' That, in turn, brings me to my final point. The subtitle of the conference in Trieste, which calls for a "New Partnership for Sustainable Development."

The most critical word in this subtitle is "Partnership," which refers not just to the relationship between education, research and innovation" but also to the relationship between individuals and institutions in both the developed and developing world. "Science," wrote Abdus Salam, the founding director of the International Centre for Theoretical Physics," is the common heritage of all humankind." I am sure that if Salam were alive today, he would be the first to agree that science ? together with research and innovation ? are also among the most common elements of our future as well. It is in the spirit of partnership that UNESCO looks forward to the discussions that will take place at the G8/UNESCO Forum and to the follow-up activities that will enable our global society to reach out to the frontiers of science while simultaneously attending to the needs of our most vulnerable citizens.

Koïchiro Matsuura, General Director, UNESCO

Tuning into diversity

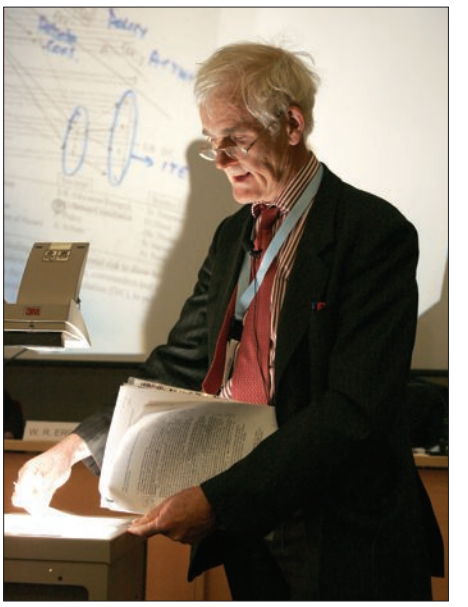
Opening remarks:

The Forum was opened by the Director of ICTP, K.R. Sreenivasan, who explained how this event had originated as a follow-up of various discussions that took place at the 2006 G8 Summit in St. Petersburg. The knowledge triangle was introduced afterwards with the three sides of Education, Research and Innovation by DG of UNESCO, Koïchiro Matsura. Furthermore, Riccardo Illy, President of the Friuli Venezia Giulia Region, noted at the outset that Trieste is host to numerous institutes, including universities, science parks like the Area Science Park, with the Sincrotrone and the new free electron laser being developed as particular highlights there. He noted that innovation cannot exist without research. Hamadoun Touré, Secretary General of the International Telecommunication Union, cited later on that 2015 was the year set for ICT connections in every hospital, school, etc., in the world. He stated that we do not need new resolutions—we need to implement those that we already have. In this context, he noted that the research community is known to be practical and goal-oriented, and that this group would know how to roll up their sleeves to implement concrete programmes.
He also stressed that development programmes cannot be conceived in Paris, or Geneva or Washington, etc., but must come from the developing nations themselves - otherwise they simply "… will not fly." He also stressed "capacity-building", the need for "real development on the ground".
Noting the need for international co-operation, he cited the ICTP as a good example of an agency which is helping in this regard.
Furthermore, Panitchpakdi Supachai, Secretary General of UNCTAD, spoke about the new challenges facing the United Nations in a broader context. Access to knowledge was noted as a divider between developing and developed countries. Technology and innovation need to be indigenous—undeveloped countries must not be passive and simply allow technologies to come in. They must be producers themselves. For this they need a solid scientific engineering educational base. But he thought that education should be tailored to the needs of industry, for instance. There are certain areas that would be more important than others for many of these countries, such as health and agriculture, that are presently underfunded. To stop the brain drain he suggested the need to create a "critical mass" of scientists and researchers.

Lamya Ahmad Al-Saqqaf, Permanent Representative of the State of Kuwait to FAO, Chairperson of the G77 noted at the end that technology has almost become a divider rather than a bridger of the gap between developed and undeveloped countries, that the gap between the world's rich and poor may be becoming even greater as the pace of technology increases. She stressed the need for human resource training, centres of excellence and development partners, and for finding "unofficial" donors for the cause and locating new sources of funding. Finally she noted that special attention should be given to the least developed countries.
At the end of the opening remarks, Italian Prime Minister Prodi noted that there is always a new "hot point" but that the difficult part was the follow-up stage.

Session I, "What partnership to develop in Global innovation society?":

Mr. Pistorio had several recommendations to accelerate co-operation between Universities and Small Companies. Prof. Calzolari mentioned that universities need a clear understanding of the role of knowledge transfer – there must be a distinction between private and public research. Furthermore, Prof. Livanov commented that the government is a less successful investor compared to businesses but is good at large multidisciplinary projects. Mr. Zhang Xinsheng noted that "knowledge-based society" has become a catch phrase and we must not forget that it implies much thought and effort. Citing the example of China, he noted that the government was willing to lose a few percentage points from the GNP in order to promote massive education reform. Talking of a global innovative society, he cited the need for south-south, south-north co-operation.



Session II, "Education in knowledge based societies":

Mr. Mark Bray's statement that we need "equity rather than elitism" evoked a strong response from the audience. Dr. Stefano Fantoni, director of SISSA, recommended that there should not be any impoverishment in the quality of education – it should be kept as high as possible. The problem of immigrant population and the low education levels of their children is a problem in Germany. We should introduce the concept of "brain circulation" rather than brain drain. Rector Honsell described in detail his university's efforts to introduce innovation in the curriculum, with examples of success stories. The concept of "Technoseeding" was presented to the audience.

Session III, Environment and Global Challenges:

Laura Marchetti, Under-Secretary of Ministry of Environment, noted that we need to introduce a fourth element in the triangle of knowledge – the concept of preservation – preservation of local knowledge, cultural diversity, biodiversity, etc. Mr. Oborne suggested an integrated approach to global challenges through knowledge management. Educational qualifications are only a "shadow measure of knowledge". Lord Hunt of Chesterton – a distinction should be made between hazards and vulnerabilities, and integrated responses to climate changes must be developed. Giuseppe Morsillo made the connection between Space and the triangle of knowledge; space-based science can have many human benefits.

The Audience:

In all sessions, the audience had many thought-provoking questions – e.g. lack of basic necessities in Uganda, progress made in Rwanda in primary education, water and environmental problems in Algeria, etc. *(Joe Niemela, Surya Raghu)*

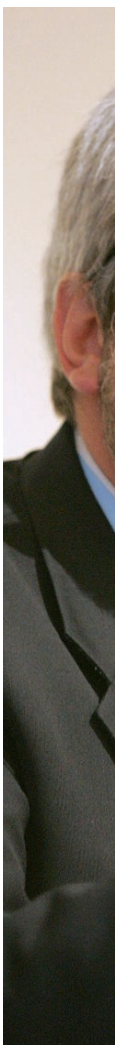
K. Matsuura

Innovation & Science

Francesco Peroni

Rector of the University of Trieste

It is common opinion that the new mission of the university rests on three essential pillars: scientific research, education/training and transfer of innovative research results to the productive world. Although these functions are strictly interconnected, education socially has the primary role of promoting the development of individuals and of the entire community by offering high quality training to the new generations and granting, at the same time, continuing vocational training to those who are already part of the active work force of our society. Without such actions it would not be possible to face the challenges of the global competition. In this sense we can affirm that education – and especially academic education – is the keystone of the development of any organised and civilised community and, in such a perspective, it fulfils a primary social function of any country that wishes to define itself as advanced.
On the other hand, it must be said that such a social dimension gives educational institutions a special solidarity prominence, also in the perspective of policies supporting developing countries. Here comes the ethical aspect of the transfer of knowledge that calls for the governments of the more developed countries to contribute – by means of adequate solidarity choices – to the social promotion of the less fortunate communities. It must also be noted that, if the scientific research and the educational systems require an increasing commitment in terms of human and financial resources in order to face the global competition, it is this same competition that – on a global scale – imposes expenditure policies on the traditional welfare systems. The result is a contradiction between the ethical commitment of knowledge transmission and market dynamics, which have heavy repercussions also on the academic world. The university is called upon, on the one hand, to produce development and, on the other, to contribute to the reduction of public expenditure. Passing such a test requires a collective awareness of the strategic function that the university is called upon to play. It is a challenge for the academic institutions that, once more, must be able not just to produce a collective knowledge, but also a collective “conscience”.



Renewable energy to build a sustainable future

Isao Ike Yukawa, Adviser, former President, Kyocera Solar Group, Japan: Global energy policies should make it a priority to develop renewable energy and expand energy storage capacities, especially in rural areas in developing countries that do not have access to a centralized energy grid. Building an electricity grid is expensive and when the grid relies on fossil fuels as its major energy source, it only adds to the global warming problem. Many developing nations enjoy an abundance of solar energy that can be used to generate electricity. To help developing countries tap this resource, developed nations should lead by example and increase the use of renewable energy in their own countries. At the same time, developed nations should encourage and assist developing countries to make use of these technologies. Renewable energy policies should be clearly articulated, and renewable energy laws and regulations should be easy to implement. Actions that generate clean energy should be rewarded. Actions that pollute and worsen global warming should be discouraged. Renewable energy policies should also be designed to nurture self-sustaining markets and spur employment. Governments, particularly local governments, should institute financial incentives to encourage the construction industry to build ‘zero-energy’ buildings. Local governments should also streamline building permits and other regulatory and administrative procedures for construction firms to encourage them to build energy-efficient structures. International agencies like UNESCO, UNDP, the World Bank and IMF should partner with environmental groups, nongovernmental organizations and private foundations to help fund such projects in the developing world.”

“UBUNTU” DECLARATION’: mobilizing the education sector to contribute to sustainable development

In 2002, 11 of the world’s foremost learning and scientific organizations signed a declaration calling for the strengthening of science and technology education for sustainable development. According to Walter Erdelen, Assistant Director-General for Natural Sciences of UNESCO, the declaration focused on three main points -the need for a greater global emphasis on education; the essential role of education in the continued and effective application of science and technology; and the importance of partnerships. The signatories to the Ubuntu Declaration are the United Nations University, UNESCO, the International Association of Universities, the Third World Academy of Sciences, the African Academy of Sciences, the Science Council of Asia, the International Council for Science, the World Federation of Engineering Organizations, Copernicus-Campus, the Global Higher Education for Sustainability Partnership and University Leaders for Sustainable Future.

e Education Awareness

Furio Honsell

Rector of the University of Udine

In the knowledge economy/society it is not enough for universities to operate only according to the two traditional missions: higher education and research. They need to perform a crucial third mission: service to their community and to operate as a strategic institution for the social, cultural and economic development of their region. This is not just a matter of enhancing technology and knowledge transfer from academia to business. Universities have to demolish the walls of the ivory tower and become open institutions, human capital factories, knowledge factories, and regional development factories. Consequently both researchers and students must understand the economic and management issues and implications behind their activities, must develop entrepreneurial skills, and be aware of how to pursue capitalization of research. Far from being a threat to their traditional activities and autonomy, or, even worse, a betrayal of university and education values, this will enhance the overall impact of their research and knowledge-based activities.

To put it in a nutshell: in the XVIIth Century Galileo had a terrific impact on the future of the world which triggered the scientific revolution. This he achieved by building less than ten telescopes which he donated to the royal families of Europe.

He could not have possibly had such an impact in this century without filing a patent, drawing up a business plan, starting and incubating a university spin-off company to manufacture telescopes. At our university, we have developed a special strategy for increasing the entrepreneurial skills of our students and for making them aware of how to capitalize knowledge-based activities. We have promoted patents-filing, we have been carrying out a Business Plan Competition, we have joined forces with many local stakeholders and started a technology park and a spin-off incubator. I am convinced that the strategy of capitalization of research, building on regional partnerships, is at the core of all successful and sustainable initiatives that universities can carry out in the present society. It applies both in G8 as well as developing countries, and has to be at the core of all joint internationalization and co-operation programmes between universities. I will illustrate below four examples of joint international collaborations according to these principles. The first is with the University of Yaounde and the Ministries of Animal Husbandry and Health of Cameroun for training veterinary doctors in the most recent techniques for safety control and certification of food products of animal origin. The second is a joint degree in wine technologies with the University in Mendoza (Argentina). The third is a joint Masters with the JNTU University in Hyderabad (India) for building virtual museums and IT for cultural heritage. Finally, we have a cluster of projects for disseminating civil protection and risk management expertise and safety at work. All these projects capitalize both research and regional entrepreneurial vocations".

The Challenge of the Millennium Development Goals

In September 2000, at the UN Millennium Summit, world leaders agreed to a set of time-bound and measurable goals and targets to combat poverty, hunger, disease, illiteracy, environmental degradation and discrimination against women. Placed at the heart of the global agenda, they are now called the Millennium Development Goals (MDGs). The Summit's Millennium Declaration also outlined a wide range of commitments in human rights, good governance and democracy. The 8 MDGs - which range from halving extreme poverty to halting the spread of HIV/AIDS and providing universal primary education, all by the target date of 2015 - form a blueprint agreed to by all the countries of the world and all the world's leading development institutions. According to the the UN Development Group, the world is making progress towards the MDGs, but it is uneven and too slow. A large majority of nations will reach the MDGs only if they get substantial support - advocacy, expertise and resources - from outside. The challenges for the global community, in both the developed and developing world, are to mobilize financial support and political will, re-engage governments, re-orient development priorities and policies, build capacity and reach out to partners in civil society and the private sector.

Science and Innovation

Robert Aymar, Director General of CERN: *"Fundamental research is the primary force for innovation, where innovation is understood to be a new idea, method or device that is being realised and exploited. History teaches us that big leaps in human advancement have mainly come about as a result of pure curiosity. Innovation may occur when new scientific insights and clear needs come together in applied sciences or industry. Countries that score highly in innovation support excellence in pure and applied sciences and create favourable conditions to foster applications for industry. With information and communication technologies (ICT) such an environment can be created remotely by making scientific knowledge freely available and by collaborating towards common goals, using novel, ICT-based collaborative tools. This offers the opportunity to collaborate internationally in sciences and related fields and to address greater challenges. It also facilitates collaboration between universities in developed and less developed countries with the aim of educating more young people to become teachers, doctors, entrepreneurs and leaders in less developed countries. The G8 and UNESCO should promote and support local initiatives in such regions to connect universities and trade points to the internet at sufficient bandwidth, and hence help to bridge or alleviate the "digital, scientific and development divide" between the rich and poor countries."*

Hans Van Ginkel

UN Under-Secretary-General, Rector of UN University, Japan

Professor van Ginkel's message to the G8 UNESCO Forum focuses on the importance of knowledge and sustainable development. His address launches two core questions: "How to place research and innovation on the national, as well as on the international agenda for development?" and "How to enhance scientific capacity in developing countries in order to generate appropriate technologies and to have political decisions based on the best available information?". Furthermore, the UNU Rector underlines the importance of "our shared future and the ways in which knowledge can help us achieve our ultimate aims for a safer and more secure world and a better quality of life for all". Hans van Ginkel is also proposing various "policy lines", necessary for achieving the Millennium Development Goals and those of the UN Decade of Education for Sustainable Development. With regard to education, "all education (formal and non-formal) at all levels and in all sectors must be reconsidered and transformed so as to prepare the next generations to better contribute to the sustainable development of their societies". "Education for Sustainable Development" (EfSD) and "Education for All" (EfA) are two sides of the same coin, and can only be achieved when all levels and all sectors of education are developed in a balanced way. In this context, "it is clear that scientific knowledge must contribute, inter alia, to technological innovation and must also find its way into education to prepare new generations to contribute to new scientific knowledge and innovation". In a comparable way, innovations contribute to the development of new knowledge and find their way into education to foster new generations of better equipped scientists and innovators who embark on their work at a higher level.
Furthermore, "if we want to focus successfully on education, scientific research and technological innovation and their inter-relationships with particular attention to developing countries and sustainable development, we must understand both knowledge and innovation in a broad sense, including economic, social, cultural and political aspects, not in a narrow technological sense. Hans van Ginkel thus maintains that Poverty Reduction Strategy Papers and other plans focusing on sustainable development - which try to promote 'self help' solutions - should include proposals to strengthen education, knowledge and innovation capacities in the region in question. The objective could be "to create "home-grown" human and institutional capacities for education, knowledge development, preservation and transfer, as well as to strengthen specific innovation systems". Last but not least, "it is crucial to involve all stakeholders, including government/ political leaders, business and other representatives of society in an early stage in the planning and implementation of programmes and projects aiming at strengthening the 'Knowledge Triangle'"

Pratap C. Reddy

Founder and Executive Chairman, Apollo Hospitals Group, India

A trained cardiologist with international experience, Dr. Reddy is well known in the medical and business communities. He worked at the Missouri State Chest Hospital (US), where he headed several research programmes. He also served as the Chairman of several scientific meetings and presented papers at US medical conventions. In 1983, the absence of world-class medical facilities in India spurred him to set up the first Apollo Hospital in Chennai, at a time when private healthcare institutions were virtually unheard of in India. Over the years, Dr. Reddy has been able to attract leading medical talent to India, including doctors from hospitals in the US and UK. He has also been instrumental in bringing about several regulatory changes concerning licensing, ceasing of import restrictions, permission for organ transplants, etc.. Reddy's pioneering approach and tireless efforts have contributed significantly to the emergence of the private healthcare sector in India.

What is your opinion of the added value of the Forum as compared to other similar international events?

The Forum's added value comes from its structure. Participants include members of the G8 countries as well as others from developing countries. The speakers have been drawn from the educational, scientific and entrepreneurial worlds, and have representatives from both the public and private sectors, thus giving the Forum a fairly widespread representation, spanning geography, economy, industry and culture.

What is the role you foresee for your country in the field of sustainable development ?

India and Indians are leading contributors to the global economy.
International discussion forums such as the G8-UNESCO World Forum will certainly stand to gain from India's insights and experience, which are founded on the strengths of the size of its population, its economy, and its entrepreneurial might. As the Founder and Executive Chairman of India's first and largest corporate hospital chain, I represent 'New India' - a country where private enterprise has spurred an unprecedented economic resurgence that has not only taken the country by storm, but also the entire world, a corporate India confident in its own ability to add value to both the national and global economies.

Hebe Vessuri

Head of the Department of Science Studies, Institute of Scientific Research, Venezuela

In her summary, Vessuri emphasized three main aspects of the presentations from the sessions- the regional and local dimension, the brain circulation and the HE governance to enable both new knowledge and equity challenges to be assured. Various speakers underlined the fact that the "university, industry, and government operate in a national and international context, but they occupy local sites" as well. There is no disjunction between the global and the local, but a continuum with countless mediations, including strategic anchoring on national innovation systems. Public policies must thus have dual or multiple approaches to attend to a complex set of problems. "When considering capacity-building for example –said Vessuri-, it is not a question of thinking only of science and technology, as has often been done, but it must include enabling local populations to improve their condition in connection with practical knowledge issues (traditional or not), while promoting a better appreciation of local needs and opportunities. The session "postcard" proposed by Hebe Vessuri highlights the importance of dealing with the issue of how emerging localities can compete with the high-stakes world of high technology as well. "Given the diversity of local situations in the world it is only sensible to wonder whether this is the right sort of question to be asked or expectation to be held". According to various speakers, "the high-stakes world of high tech is not even remotely the only possible way to develop and grow for a dynamic locality". Even more, in the future, this is going to be the exception rather than the rule. "We should rather be thinking of exploring alternatives that take account of the diversity of situations". Therefore, "instead of asking what a local context can learn in its effort to copy from the experiences of the great industrial complexes that have grown in the world, it seems more promising to explore the peculiar combination of the local conditions and endowments with the regional, national or even global opportunities, on the basis of capacity building and strategic thinking". The second comment has to do with brain circulation, said Hebe Vessuri, that underlined the increasing importance of migrations and brain circulation. According to the session rapporteur, in view of the global 'requirements' of the new economies, various speakers focused on the necessity to establish practical arrangements reflecting a renewed approach to human mobility. "The losses to developing countries are a real threat and we must move from 'brain drain' and 'brain gain', to a new set-up in which developing nations will be compensated by their contribution to human resource provision to the global economy by concrete mechanisms, as countries like India are doing".The third issue deals with education governance, the identification of the best models of education governance, teaching and management. According to Hebe Vessuri, "an improvement in university governance is observable in many different contexts, together with an intense period of reform in the laws of higher education in many countries".

Carlo Rizzuto *President, Elettra Laboratory, Italy*

In his summary, Rizzuto highlighted the key points of the session, focusing on the role of universities, "highly strategic for the development of innovation and entrepreneurship". This role is actually implemented through several channels, the most effective being Education, Knowledge Sharing and Knowledge Transfer. According to the president of ELETTRA, all speakers underlined the fact that "these channels must be enhanced by appropriate long-term strategic policies and actions, the most effective being evaluation as an instrument to increase excellence, and the growth of cultural affinities based on sharing norms giving value to mobility and openness". Furthermore, "the enhancement of the strategic role of universities can be achieved by benchmarking and best practices". Excellent industries collaborate with excellent universities, and know how to find them; the measure of excellence for universities is the quality of basic research, while excellence of an industry is measured by its market competitivity. In this context, it is important that appropriate criteria be applied to define excellence, without mixing them or the missions. "Once excellence is ensured, competition and collaboration can easily coexist, as there is no need to be defensive or fearful of being open". Another important point that came out during the session was the fact that participants underlined the essential role of governments in ensuring that a favourable environment exists for growth and for strengthening the links inside the triangle of Knowledge, Research and Innovation. "Better to lose a fraction of GNP, than to save on education! Education is the heart of innovation." In the context, in the globalized world, a region should aim at "capturing the flow" and be able to allow changes by responding to the rapidly changing world, rather than close its borders. As far as the specific barriers are concerned (fiscal and institutional barriers), "these should be addressed by countries to promote combined investments". In order to achieve this, though, the society needs long-term strategies, political focus and persistence.
The specific barrier to be overcome within and around the universities is the disciplinary fragmentation, said Rizzuto, while summing up the conclusions of the session. In this context, according to the Session speakers and participants, "society needs a strategic approach, by all actors, towards responding to the rapid change of society, with commensurate change and flexibility on the part of the universities.

Programme of Saturday 12 May 2007

09:00-10:00 Knowledge and Sustainable Development

Chair
Professor Jacob **PALIS**
President
The Academy of Sciences for the Developing World (TWAS)
National Institute of Pure and Applied Mathematics
BRAZIL

Keynote speakers
Professor Hans **VAN GINKEL**
Rector United Nations University
TOKYO

Hon. Professor **ATTA-UR-RAHMAN**, FRS
Adviser to the Prime Minister on Science and Technology
Chairman [Federal Minister]
Higher Education Commission
PAKISTAN

Dr. Dimitri **PISKOUNOV**
Deputy Director-General
UNIDO
VIENNA

10:00-10:30 Discussion and the Report of the Rapporteur
Rapporteur
Professor Teboho **MOJA**
Department of Administration Leadership and Technology
The Steinhardt School of Education
USA

10:30-11:00 Coffee Break

11:00-13:00 Special Session on "Science, Technology and Innovation: Perspectives for Africa"

Coordinator
Professor Mohamed **HASSAN**
Executive Director The Academy of Sciences for the Developing World (TWAS)
President African Academy of Sciences
TRIESTE

Welcome remarks
Ambassador Armando **SANGUINI**
Personal Representative of the Prime Minister for Africa
Director General for sub-Saharan Africa
ITALY

Opening Remarks
Professor Nagia **ESSAYED**
Commissioner for Human Resources, Science and Technology
African Union
ADDIS ABABA

ROUND TABLE DISCUSSION
Hon. Professor Hany Mahfouz **HELAL**
Minister of Higher Education and Scientific Research
EGYPT

Hon. Dr. Noah M. **WEKESA**
Minister of Science and Technology
KENYA

Hon. Prof. Romain **MURENZI**
Minister of Science, Technology and Scientific Research
RWANDA

Hon. Dr. Yaye Kène **GASSAMA DIA**
Minister of Scientific Research
SENEGAL

Closing Remarks
Hon. Dr. Patrizia **SENTINELLI**
Deputy Minister of Foreign Affairs
ITALY

13:00-14:30 Lunch

Closing Session

14:30 - 15:45 Knowledge for Sustainable Development: The Future

Chair
Professor Werner **BURKART**
Deputy Director General
IAEA
VIENNA

Keynote Speakers
Professor Édouard **BRÉZIN**
Former President of French Academy of Sciences
Laboratory of Theoretical Physics of the École Normale Supérieure
FRANCE

Mr. Roger H. **SCHJERVA**
Deputy Minister
Ministry of Finance
NORWAY

Sir David **KING**, FRS
Chief Scientific Advisor to H.M. Government and Head of the Office of Science and Technology
UK

15:45-16:30 Discussion

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Photo first page: Indira Savitree, delegate from Mauritius