

ХРОНИКА НАУЧНОЙ ЖИЗНИ

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World Conclave of Scientists on “Regional Cooperation in Science & Technology: Opportunities and Challenges in the context of Globalization” during 26–29 November, 2010 at Indian National Science Academy (INSA), New Delhi

UNESCO South Asia & South East Asia Science & Technology Policy Forum & Zaheer Science Foundation, New Delhi organized World Conclave of Scientists on “Regional Cooperation in Science & Technology: Opportunity and Challenges in the Context of Globalization” during 26–29th November 2010. The venue of the Conclave was Indian National Science Academy (INSA), New Delhi. The Conclave was attended by a large number of delegates from Sri Lanka, Nepal, Pakistan, Malaysia, South Korea, Thailand, Italy, UK, Russia, Finland, Afghanistan, Australia, Germany, Mexico and USA. There were six Keynote Addresses and 34 research papers were presented in the areas of Climate Change and Environment; Health Services; Information and Communication Technology and Science and Technology Policy Studies. One of the important features of the Conclave was the presence of Member of Parliaments of the region including India who participated in the special session of the Parliamentarians on science and technology policy of their respective countries.

The Conclave was inaugurated by Dr. B.P. Singh, Governor of Sikkim and chaired by Dr. Abid Hussain, formerly Ambassador of India to USA. Dr. G. Thyagarajan, formerly Director of CSIR Institutes and President of Madras Science Foundation, Dr. Lidia Brito, Director, Science Policy Division, UNESCO, Paris addressed the Conclave. Vote of Thanks was given by Dr. Mohsin U Khan, Secretary, Zaheer Science Foundation.

Dr. Abid Hussain in his opening remarks stressed the need of a comprehensive Science and Technology Policy of India although earlier policies launched were very effective and played an important role in the development of Science and Technology in the country.

He welcomed the participation of Parliamentarian in the Conclave which will give a new direction to the Science and Technology Policy of the region as a whole.

Dr. B.P. Singh, Hon'ble Governor of Sikkim congratulated Zaheer Science Foundation and UNESCO South Asia and Southeast Asia Science & Technology Policy Forum for organizing the Conclave. In his address he stated that India was one among the fast developing countries to adopt Scientific Policy Resolution in 1958 under the dynamic and visionary leadership of the first Prime Minister of India, Pandit Jawaharlal Nehru. It was he who relentlessly urged the youths of India as well as other developing countries of Asia & Africa to inculcate among themselves scientific temper and rational way of thinking.

The framers of the Scientific Policy Resolution wanted its content to form the basis for intensive discussion with scientists and educationists of the country so as to evolve plans and programs to advance the cause of science & technology.

In this background, Zaheer Science Foundation was established in 1970 as an NGO to help the Government Departments in the promotion of scientific research and higher educational activities. The inspiration of starting the Foundation came from the perception that there was a gap in the area of interaction between science & society and that the Foundation could bridge that gap to foster scientific attitude and temper among the people.

His Excellency advised the Conclave to consider the following four issues for discussion:

1. Globalisation is a reality. It, however, does not include all human activities at the same level or with the same intensity. While globalization has integrated markets and the banking system, it has yet to make a decisive impact on dialogue and cooperation between scientists and innovators either of a region or at global level. This is a challenge which a Conference of Scientists like this one must address. His Excellency emphasized that this Conference should take note of this and work to help accelerate the pace of cooperation among scientists and innovators in the region and in the world over.

2. The second issue raised by HE was that the South Asia and Southeast Asia region, the focus of this Conclave, has several fundamental strength like widespread ocean, rivers and wetlands, sunny days, rich biodiversity and common cultural processes. The biggest strength perhaps lies in the fact that it is a youthful region. The youth of the region has developed both aspiration and a determination to move forward in tackling the problems of poverty, diseases, backwardness that affect countries of the region. How do we meet these aspirations at Science & Technology levels?

3. H.E. stated that if the global scientific community had worked hard to develop solar energy technology in the past, the energy scenario in the region would have been different. It would have ameliorated the condition of our people and we would have been at a higher level of development than at present. Would the scientists assembled here and outside pay attention to this aspect of energy generation and work with a speed that could enable us to catch up with the lost opportunity?

4. Drinking water is a matter of concern: His Excellency felt that the issue which bothered him with regard to drinking water technology related to conversion of saline water into potable water. Major technology improvements would go a long way in lowering cost of conversion of saline water to potable water and this would in turn ensure better availability of drinking water to the people. Let this Conference take note of this issue and view it with urgency in the context that water has the potential to be a cause of conflict.

HE raised the following questions in this context:

- Do the countries have the tools and expertise to tackle ocean spills and waste dumping?

- Do we have the state-of-the-art analytical facilities for rapid and accurate direction and identification of the culprit substance and their traceability?
- Is a regional emergency response service in place?
- Is it not desirable to design relevant expert system?

Everyone of these would involve cross disciplinary research and development. Institutions in the region have the talent and attitude to come together and find solutions, associating competencies existing beyond the region as needed.

Dr. Thyagarajan in his address paid obeisance to Dr. S Husain Zaheer, formerly Director General, CSIR, has initiated in 1965 the International Scientific Collaboration Wing and established bilateral program between CSIR and parallel scientific and technological organizations abroad, especially in developing nations.

Dr. Thyagarajan outlined the attributes and concerns common to the countries in South Asia and South East Asia Region.

First, the oceans: most countries are maritime states with access to marine resources, living and non-living.

Second, high population density: the importance of food and nutrition, their availability, quality and equitable distribution are of the foremost concern.

Third, cultural similarities: cultural processes play an enabling role in scientific co-operation. Tolerance and respect for other belief systems facilitate team work.

Fourth, biodiversity: the region hosts biodiversity hotspots and rain forests and is a treasure of traditional knowledge.

Fifth, human resource: sound educational institutions and S&T systems supported by research and development institutions are assets.

Sixth, thrust on Industrial innovation and enabling public policies.

He stressed on fundamental strength of the countries of this region, offering powerful and suitable backdrop to mount.

He gave examples of 1) discovery of new drugs because seas are known to be repositories of highly biologically active organisms and substances of value in research drugs. 2) Forest fires, because South Asia region presents a unique situation where sovereign nations are separated by short sea distances which introduce a new dimension of ocean dynamics in the spread and penetration of fires and haze. 3) Industrial Zoning and Disaster Prevention: The social, legal and economic consequences of major chemical accidents are now well known. There are lessons to be learnt. It will be useful to bring interested countries together in this Conclave to exchange ideas and identify short term and long term measures for industrial zoning coping with technological change and crisis management strategies. 4) Tackling Sea Pollution: a) Do the countries have the tools and expertise to tackle ocean spills and waste dumping? b) Do they have the state-of-the-art analytical facilities for rapid and accurate detection and identification of the culprit substances and their traceability? c) Is a regional emergency response service in place? d) Is it not desirable to design relevant expert systems?

Dr. Lidia Brito in her address said that Science Policy Forum will focus on the ways in which globalization impacts science & technology changes and vice versa and the opportunities these changes offer in the better utilization of science and technology to foster peace, improve quality of life of people and promote the sustainable growth and the development in the region. It will stress the important issue of regional cooperation on science and technology, notably the challenges and opportunities for policy makers.

Today, mastery of science and technology is shifting to Asia: this is, clearly the most important message of the UNESCO Science Report 2010 recently launched simultaneously worldwide. Asia is now playing a significant role in the science and technology innovation of the world in terms of R&D investment, human resources and scientific output. Asia is diversified and imbalanced in terms of culture, the development of economy and S&Ts. Countries within the region are different with competency and strategy for success. Some countries in the region have established high quality research program. These countries are in a strong position to cooperate with others in developing effective science policies. Scientific communities of the Asian countries will be able to make valuable contributions for overcoming challenges and barriers and promote developments in Asia and in the world at large.

The need to reinforce regional cooperation among countries is a subject of strategic importance for UNESCO. While UNESCO has an international mandate and also responds to the request of member States, it attaches great importance to cooperation and integration at the regional level as one of the key means of addressing issues of globalization.

It is UNESCO's belief that effective regional cooperation and collaboration in science and technology is a powerful tool in order to:

- tap the human potential in the Asia region as a whole and take advantage of these resources for the well being of the people and for the economic development of the region.
- build capacity and empower people in the region.
- foster increased bilateral cooperation between countries in the region through greater networking and increased resources.
- address regional problems such as poverty, climate change, and loss of biodiversity, natural disaster and other areas of common interest. In other words, the development of regional partnership in science and technology will serve common interests among the Asian countries and contribute to lasting development in Asia and in the world.

Dr. Mohsin U Khan gave the vote of thanks but before that he raised several issues with regard to regional cooperation in science and technology. He emphasized that there is an urgent need for an active operational network among South Asian and Southeast Asian Countries on Science & Technology Policy. He suggested that the participants could formulate research projects while participating in the brain storming sessions. He suggested that there is a strong need to establish quality infrastructure in the area of higher education not only in India but in other developing countries as well through regional cooperation.

Day one first session: "Climate Change & Environmental issues"

The seminar started with the Keynote Address of Dr. V Prakash, Director, Central Food Technology Research Institute (CFTRI), Mysore, India. He observed if climate change matters to us we shall matter more to it. He said that the food and nutrition security is very critical and intensely related to the sensitiveness of climate changes and in particular, the global warming which can directly and indirectly affect the productivity and production of food. It is well known that for every 1°C rise in temperature there is a decrease in productivity of the agriculture crops by 10% and that is a huge loss to the human beings.

Another issue of concern is health aspects which is very important as well. For every 1°C rise in temperature, records show that there is phenomenal load in the hospitals up

by 7%. Dr. Prakash showed his concern especially for the tropical diseases. The climate change affects fish and health and therefore, it affects the nutritional agenda in ambit. The nutritional security is very critical especially for children and women and the needy.

He concluded that the traditional knowledge of a country is a treasure which provides knowledge on the nutrition and food security and preventive medicine for health and wellness.

Dr. S. Rajamani, Chairman, International Union of Environmental Commission, Chennai, Tamil Nadu, gave his presentation on “Recent Technological Development in Cleaner Production and Green Development for Control of Green Hydro Gas Emission and Climate Change”. He shared his experiences on the basis of international study on methane emission from cows and paddy fields, biological liquefaction biomethanation plant and a case study on vegetable market and thereafter on biogas generation. Dr. Rajamani recommended that to control global warming/Climate change, cleaner technology and plantation of special trees which are good CO₂ absorber can be considered to secure clean climate.

Dr. Syed E Hasan, University of Missouri-Kansas City, USA gave his deliberations on “Proper waste management: An economic & environmental imperative”. He said that proper planning is required to dump or destroy hospital waste through electronic incinerators which should be done in the beginning itself. Cases have been noticed where illegal dumping of waste material is done in rivers, sea or any other water reservoirs which ultimately leads to health hazards.

Dr. M U Beg, Department of Environmental Sciences, Kuwait Institute for Scientific Research, Kuwait in his presentation on “Persistent Toxic Chemicals: Problems and Prospects of Developing Countries” said that Persistent Toxic Substances (PPS) are chemicals that remain in the environment for long period and accumulate in the fatty tissues of the living organism. There is an urgent need to develop a joint action plan to eliminate or reduce the quality of chemicals into the environment. The important challenge before us is safe disposal of banned chemicals like DDT, etc.

Professor M P Srivastava, Department of Physics and Astrophysics, Delhi University, India made a presentation on “Sustainable development and carbon dioxide decomposition by plasma routes to combat Climate change”. He said that one of the factors contributing to climate change and global warming is increasing emission of CO₂. It has been suggested to decompose CO₂ into its constituents and recycle carbon. Since this route has not yielded good results a scheme which uses an array of high voltage electrode system producing electric field with cross magnetic field has been proposed by him.

Second session: “Science Technology and Innovation Policy”

The main thrust of the session was on tracing the evolution of national strategies and S&T policies over the last 4–5 decades directed at boosting the innovative capabilities, competitiveness and economic development, as also for development of the human resources and regional innovation systems of the respective countries.

Dr. Pichet Dulong Kaverroj, The National Science Technology & Innovation Policy, Thailand, traced the paradigm shifts in public policies related to S&T and innovation in Thailand from 1960’s onward to boost national economic competitiveness as well as to tackle the looming problems of climate change, aging population, newer diseases, energy demands, food security, etc. The current Thai S&T policy regime has chosen to bring about

increase in three key variables related to S&T infrastructure by 2016: Gross Expenditure on R&D, the ratio of R&D personnel per 10,000 population; and the ratio between private and public expenditure on R&D through PPP and other stimulation packages including tax benefits, low-interest loans, matching funds for private R&D expenditures, incentives for starting and joining 'innovation districts' and industrial parks. Additional dimensions of the STI plans include enhancing regional cooperation (ASEAN+3 and later ASEAN+6), international mobility of S&T personnel, green innovations, etc.

Dr Kitipong Promwong, The National Science Technology & Innovation Policy, Thailand, stressed upon the pivotal role played by human resource in enhancing STI capacity and pointed out that Thailand presently has problems of (a) mismatch in the demand and supply of S&T personnel, particularly in certain S&T fields (like bioprocessing) and at certain levels and (b) shortage of personnel having skills and attributes that are required by the industry in the context of the fast changing and intensely competitive economic and technological environment — which, due to archaicness and inflexibilities, the university systems are not able to deliver. Thai policy in the current and immediate future phases has planned to tackle these problems through local and global brain circulation (university-industry), setting up Thai Advanced Institute of S&T, and enhancing private role in setting up the course curricula and stimulating administration of specialized course. Specific sectors like food, retail, tourism, automobiles are taking increasingly proactive roles in HRD by starting their own respective training institute and employing students even before they finish the undergraduate or post-graduate courses to impact specialized skills and attributes needed by the industry.

Dr. Taeyoung Shin, Science & Technology Policy Institute, Seoul, S. Korea, presented facets of the successful transition of the Korean economy to one of the present global industrial powers of reckoning led by the deliberate Government STI policies involving increasing investments in R&D, HRD, and emphasis on globally competitive innovations in its R&D program. The present STI related programs also include building up and nurturing 26 regional innovation districts (GRI). The present composition of its industry had overwhelming proportion of complex technological sectors as compared to simpler sectors. However, in the present innovation-led economy there is evidence of emerging bipolarization between the manufacturing and services sectors vis-à-vis employment generation and productivity.

Dr. Raine Hermans, Impact Analysis, TEKES, Helsinki, Finland, shed light on the current phase of the Finnish innovation system facing a new paradigm. Based on attempts at synchronizing various propositions from the trade theories, innovation theories, geographical economics, cluster dynamics, etc, he presented investigations into the various regional innovation systems within Finland. These have resulted in evolution of a national strategy involving formation of Finnish thematic regional innovation platforms fueled by exploitation of related varieties and key complimentary and cross-cutting competencies. He presented examples of such innovation platforms by cooperative development of two disparate regions in Finland, one located in 'centre' of an economically developed region and another in the 'periphery' of another less developed potential region by exploitation of key cross-cutting and complimentary competencies.

Dr. Nadia Asheulova, Russian Academy of Science, St Petersburg, emphasized the key roles of scientific elites as also of their continued reproduction in the development of science. She traced the influence of different political regimes on the existence and reproduction of scientific elites in Russia over the past several decades. While in the Soviet Russia the 'Schools of thought' provided self-organising systems for reproduction of scientific elites, in

the post-soviet Russia the IPR regimes have led to destruction of the scientific communities and collapse of 'Schools of Thought'. She lamented the present unwillingness of the youth in taking up science as a profession due to reasons of low salaries, lack of adequate S&T infrastructure, and uncertainties about their future. She recommended that measures like international mobility, joint projects, inviting foreign funding; allowing internships in Europe and USA, organizing international events, etc could help in building and maintaining a critical mass of scientific elites in S&T areas.

Dr. Darryl Macer, Regional Unit for Social and Human Science in Asia & Pacific, UNESCO, Bangkok, outlined the essentiality, scope and application areas, international conventions related to and mechanisms for spreading awareness about ethics in sciences, particularly bio-ethics in the current context of developments in the field of life sciences and medicine. He particularly elaborated upon: making ethics in science relevant to all (rich vs poor), identifying universalities (vs culture specific), levels of partnerships (Paternalism to informed consent to informed choice), loving good (beneficence), self-love (choice based on individual values), loving life (all life-forms) and loving others (taking care of future generations and sharing with others). He listed 15 basic principles that can guide formulation of ethical practices in science. In the end he suggested a number of mechanisms for raising awareness about ethics, like group games, music, internet, associations, formal and informal educational channels, etc.

Third session: "Health Services"

Dr. Sadhna Srivastava, Indian Council of Medical Research, New Delhi, spoke on "Promoting access to medicine through global cooperation: A strategy through North South cooperation." She gave a brief history of the Indian Council of Medical Research (ICMR) that was established in 1911 (then called 'Indian Research Fund Association'). It was renamed ICMR in 1944; the Organization will be having centenary celebration in 2011. ICMR conducts both intramural and extramural research. Dr. Srivastava talked about global and Indian disease burdens and pointed out that a major shift is projected to occur in India between 1990 and 2020: there will be a marked increase in non-communicable diseases (CHD, cancer, etc.) that will account for 43% of all deaths in 2020 as opposed to 27 % in 1990. Several reasons were discussed, including lack of R&D fund for new drugs; patent and copyright issues associated with newly approved drugs; the limitations of Trade Related Intellectual Property Rights (TRIPS) Agreement, of which India is a signatory; and technical disparities between OECD member countries and developing countries. The speaker proposed a new model to promote drug access to people in the developing countries by establishing collaboration between the Governments in the North and South; and partnerships between the governments and academia in the North and South; and among drug industries in the developing world.

Dr. Sunil K.Sharma, Department of Chemistry, Delhi University, Delhi, presented his paper on "Bio catalytic synthesis of polymeric materials for drugs and gene delivery applications". He discussed the limitations of conventional drug delivery system, including the fact that a large percentage of the main chemical constituent of a drug is either excreted out or accumulates at other sites in the body, resulting in toxicity. The polyethylene glycol (PEG) is a biodegradable, non-toxic and 'green' polymer that has many advantages over the synthetic

chemicals used for traditional drug delivery. He also discussed the worldwide overproduction of glycerol and how its use for making PEG would not only solve the problem of overabundance of glycerol but would also lead to innovative use of this compound in drug delivery.

Dr. Rita Singh, Department of Zoology, Delhi University, Delhi, spoke on “Reproductive health concerns: the impact of environmental toxicants on reproductive health of women/children”. She discussed the fact that the toxicants do not occur alone in the environment but with other toxic compounds; she highlighted the need for studies on the combined effects of these toxicants to humans, notably women and adolescent youths, as they are most vulnerable to such environmental toxicants that are known to produce adverse effects on their reproductive system. Pregnant women, exposed to spraying of the chemical *Endosulfan* in a village in Kerala, gave birth to children with serious birth defects. Significant increases in number of cancer cases in recent years may also be due to exposure of women in their reproductive age to environmental toxicants. Dr. Singh provided information on hazardous waste generated in India, noting that of the 8 million tones generated, 70 % came from five States. The ‘Hazardous waste management and handling’ act of 1998 and its 2000 and 2003 amendments failed to regulate hazardous waste. Worst of all, toxicity of a large number of hazardous chemicals on reproductive health is unknown. Dr. Singh recommended establishment of rules similar to REACH adopted by European Union — that requires full information on toxicity profile and risk to humans and the environment for all chemicals intended for commercial use from its manufacturer, before its use can be approved—in all countries of the world. She emphasized the need for public education and awareness of the risks of toxic chemicals in the environment.

Dr. Lalit Kant, Division of Epidemiology & Communicable Diseases, Indian Council of Medical Research, Delhi, presented the details of the proposed “Draft national health research policy” and discussed the growing trend in consumption of junk food, alcohol and cigarette smoking that have resulted in a significant increase in deaths due to non-communicable diseases in India. He also pointed out that India ranks very low in global indicators, such as the Human Development Index (HDI), Gender Development Index (GDI), and the Global Hunger Index (GHI). The proposed *National Health Research System* (NHRS) is designed to address many of the health issues facing the Indian people. He invited the audience to review the 10-point action program developed by NHRS and send their comments, which can be done electronically on NHRS’s website.

The last presentation was by Dr. Shahid Siddiqui, Section of Pulmonary & Critical Care Medicine, Pritzker School of Medicine, University of Chicago, USA, who spoke on “Micro solution of complex human diseases: role of micro RNAs in health and pathogenesis.” He discussed the role of DNA in life and how RNAs are made from DNA that, in turn, makes micro RNA (miRNA) protein. He discussed the critical role played by miRNA in regulating all life functions, and its many advantages in diagnosis and treatment of diseases.

Day second first session: “Science Technology and Economic Development”

This session brought out six deliberations focusing on prospects of liberalization of S&T Policy and its impact on economic development differently in various countries. The session started with a Keynote Address by Dr. S Tanveer Kausar Naim, Consultant, COMSTECH,

Islamabad, Pakistan. She not only reviewed and mapped the trends of migration of highly skilled S&T personnel from Pakistan and Bangladesh but also presented the impact of migration in terms of institutional weaknesses to plan and implement projects related to building of local technological competence and the resulting economic implications. By standard input and output indicators and comparisons made with neighboring countries, that is, India and China, she provided a clear picture regarding needed policy interventions and arresting migration and promoting knowledge based entrepreneurship with an emphasis on regional research collaboration.

Dr. Rustrem Nureev, State University Higher School of Economics, Moscow, Russia, spoke on institutional prerequisites of innovative, technological and structural dynamics. Analyzing institutional preconditions and possibilities of application of concept of social market economy in Russia, he pointed out mainly on its three basic elements, namely personal liberty, social justice and economic efficiency. He mentioned the RAND Corporation report "The global technology Revolution 2020: Trends, Drivers, Barriers and social implications" devoted to tendencies of development of 16 technologies in 29 countries and their forecasts with the help of a set of economic indicators. Dr. Nureev pointed out categorically about systematic economic policies based on three basic elements mentioned above for creating and maintaining a competitive order in Russia to attract business from abroad and to develop integrated relation with neighbouring countries.

Dr. Svetlana Kirdinia, Institute of Economics, Russian Academy of Sciences, Moscow, Russia, presented her paper on trajectory of economic institutional reforms in Russia as a framework of S&T policies. She advocated her research on institutional matrix theory that is, defining the prospects of liberalization within the framework of modernization of redistributive State economic systems and, therefore the new institutional form of State Corporations are considered as the main part of national innovation system. She elaborated upon the peculiarities of Russia's State corporations and their contributions in hi-tech development. At present, the share of State Corporations in the state budget is more than 20% and is going to be higher. State Corporation are the least risk institutions which can answer the needs and challenges of innovation and modernization.

Prof. Tateo Fujimoto, Department of Economics, Kanon University, Japan, highlighted the post war economic miracle in Japan during 1955–1991. This was the time when the economic growth was more than 9 % average but at the end of 1991 the Japanese economy collapsed. Since then the Japanese economy is facing the long-term distress. To overcome this, the Japanese Govt. has adopted various policies such as the guaranteeing of urban wages to rice farmers in its agricultural policy, modernization of rural infrastructure and greater mechanization. According to Prof Fujimoto, regional cooperation may further enhance economic growth and stability.

Prof. Arif A Waqif, School of Management, University of Hyderabad, Hyderabad, made his presentation on perspectives of modern and traditional technologies bringing out their sharply contrasting features. The modern technologies have their roots in global development in concepts based on basic sciences and their lab based applications for economic needs, while the traditional and indigenous technologies have their roots in the local market and expertise and experience accumulated and transmitted over generations of their practitioners. Prof. Waqif also explored the socioeconomic development and environmental implications of the modern and traditional technologies and suggested the need to consider a balance between the two for a better socio-economic development. He recommended strongly promoting traditional technologies through regional cooperation.

Dr. Ramesh Singh, Centre for Energy & Environment, Nepal, presented a unique example of South-South cooperation by detailing the capacity building of Tumba College of technology in Rwanda in the field of alternative energy source development in collaboration with the Centre for Energy and Environment, Nepal with financial support from JICA, Japan. The technologies developed and transferred through this collaboration are simple, cheap and suited for the two countries. Dr. Ramesh highly recommended encouragement of such collaborations to set examples of South-South and Regional Cooperation.

Second session: “Science & Technology and its impact on society”

Dr. Mrs. Sunita Garg, NISCAIR, CSIR, New Delhi presented a paper on “NISCAIR- The CSIR’s Scientific Information Resources for Science and Society”. Dr Sunita gave the detailed account of NISCAIR’s resource activities undertaking since the inception of the institute. She narrated that the NISCAIR is a proud nodal centre for implementing CSIR-journals consortium, a major network project of CSIR. Since 1942 NISCAIR has been a custodian of The Wealth of India in the encyclopedic publication on plants and animals biodiversity and mineral resources of India. SAARC Documentation Centre (SDC) set up in 1994 at NISCAIR is continuing its activities to fulfill its objectives to disseminate S&T Information among SAARC member states.

Dr. Marja Hayrinen-Alestalo, University of Helsinki, Helsinki Institute of Science and Technology Studies, Helsinki, Finland presented a paper on “Response of Europe and Asia to the New Global Order”. She stated that globalization has changed the divisions between technological centre and peripheries: Small open high Tech and newly industrialized developing countries, such as India and China, have been more resistant than US and other European countries or prone to global economic disabilities. She especially mentioned 2008-09 worldwide turbulences which still have dramatic impacts on the component of global growth. The European Union has pursued an exclusive policy with aggressive competition strategies aiming to win the game with the US and Japan for the world economic super power. From the European view point the rise of Asian countries has been mainly seen as a threat to the sustainable European development. Today China and India are listed as new rising economic powers almost interchangeably.

Third session: “Innovation Management and Technology Transfer”

Dr. Aqueil Ahmed, Core Faculty, School of Management, Walden University, North Carolina, USA, traced the history of Chinese industrialization through the last five decades and listed out policy measures that were taken so as to make Chinese economy as the second largest one in the world. However, this was achieved due to single-minded determination facilitated by a totalitarian regime and at significant social and environmental costs. He projected that given the determination and due to globalizaing contexts, the Chinese economy is poised to become not only number one in the world but also its social and labour conditions and environmental concerns would be attended to adequately.

Dr Annaflavia Bianchi, Faber Industries e futuro, Italy, while presenting lessons learnt from the successful development of Emilia-Romagna industrial region of Italy, outlined three distinct channels of supporting innovation. The first of these relates to exploiting complementarities and synergies between various strategies for innovation, such as ICT diffusion training, technology, organization HRD, etc. Also public procurement, supporting organization and technology drivers in small firms, and catching opportunities offered by green energy, food transport and services, etc should be exploited. The second channel related to the regional sectoral technology foresight exercise undertaken for advanced machinery sector in Emilia Romagna that led to strategy formulation including those for HRD. The third channel was formation of working groups for all the 21 regions of Italy for innovation. Policy support that took care of six distinct areas each, including regional technology foresight, enhancing research funding, pre-competitive development projects, public procurement, building indicators for intermediary steps, and impact evaluation models.

Dr Jaime Jimenez, Gregory Sandstorm, Mexico, outlined a successful experience undertaken in Mexico where University professors provided voluntary time for encouraging select students in science areas for solving live problems while seeking knowledge for the same from internet and other sources. This has resulted in several students developing contacts with international experts (including one Nobel Laureate) located elsewhere in the globe and finally getting internship and placement opportunities with them.

Dr. Subhan Khan, Scientist, National Institute of Science Technology and Development Studies (NISTADS), New Delhi, explained the policy development in India related to National Map Policy and the role of digital geospatial technologies in the same. Moving from a restrictive regulatory regime to an open map policy and allowing public and private access, use and value addition opportunities on the digital geospatial data sources has resulted in proliferation and useful exploitation of this tool in a number of social, medical, resource use areas, as also in disaster management, counter terrorism measures etc. He pointed out that regional cooperation in this area can lead to win-win prospects in many economic and social areas.

Day third first Session: “Information and Communication Technology (ICT)”

The session was chaired by Dr. Diana Malpede, from UNESCO, Paris and there were five presentations in the session.

The first speaker was Dr. Daniel Nepelski, European Commission, Joint Research Centre, Spain who made his presentation on ‘Internationalization of ICT Innovation: The Concept and Evidence’. He mainly discussed Internationalization of economic activity and what Internationalization means, including some aspects of it, besides raising research questions and setting an agenda. He made his presentation mainly in two parts. In the first one he discussed, ‘Internationalization of inventive input and in the second one inventive output’. He concluded that on the one hand, there is high level of inventive input Internationalization and on the other hand, very low levels of inventive output Internationalization. There is complexity of the inventive process and various motivations to ‘go abroad’ including the asset exploitation vs. asset seeking strategies. He was of the opinion that not

all international sites are created with the aim of developing patentable innovations and adapting existing products and technologies to new markets and consumer preferences. He observed 'the dynamics are high and the landscape is changing fast', and gave example of US-Asia since 2000.

The second presentation was made by Professor Zahid H Khan, Director, FTK Centre for innovation Technology, JMI, New Delhi on 'ICT and Changing face of Higher Education'. His topic touched various aspects like the expanding universe of innovation and knowledge; he gave a brief overview of ICT in education and discussed challenges of higher education in the 21st century. Dr. Khan discussed relevance & justification of the need of ICT in education and gave examples and various concepts and developments like E-resources, Virtual Labs Web 2.0 etc in education. He also discussed role of E-governance for higher education institutions and Indian initiatives on ICT in higher education. Specifically, he elaborated a case study of ICT@JMI and future trends.

The third paper was presented by Dr. Bahawodin Baha from University of Brighton, UK on 'Information and Communication Technology (ICT) for Education in Afghanistan'. He discussed in his presentation why ICT is important and what its requirements are, particularly its future workforce. He explained the application of ICT at higher education at international level and history of higher education and the progress of ICT in Afghanistan etc., and the challenges ahead, and main obstacles. What is needed was also discussed. One main point he made was that in context of ICT, location no longer matters.

The fourth paper was by Dr. Torsti Loikannen from VTT Chemical Technology, Innovation Studies, Helsinki, Finland. He discussed the role of science and innovation and the stage of sustainable information society (SIS) in the socio-economic development of developing economies. The context is the structural change of economies from manufacturing phase towards knowledge-based intangible service economy, in ICT driven globalization, in requirements to solve grand global socio-economic challenges, and in the role of market driven approaches in improving welfare of majority of population worldwide (called Bottom of the Pyramid approach, BOP). The strategy which integrates proactively and dynamically the context factors, especially innovation and development strategies, has essential impact on the welfare of developing economies. The internationalization of R&D of transnational and other corporations is among key drivers of globalization and accordingly enterprises with their R&D and innovation have important role in the change. Moreover, an important condition for policy-making is its ability to measure performance improvements with related indicators of SISs. In developed economies the changes above will challenge national R&D and innovation policies as well as development aid policies and their underlying theoretical approaches. There is need to revise the rationales of these policy areas and improve coordination between these policy areas. Development aid policy shall be shifted towards the promotion of national innovation systems (NISs), and innovation policy shall play a more integrated role in development aid policies. Empirical examples and aspects of these issues will be considered within a context of the EU policies from the perspective of one EU member country, Finland, a small open North-European economy.

The last presentation was made by Dr. Atsushi Sunami of National Graduate Institute for Policy Studies, Tokyo, Japan, on 'Japan's New Growth Strategy and its green innovation Policy'. He was of the opinion that the world is now facing unprecedented global challenges needing wide range of systematic change in the ways we live relating to climate change, renewable energy, global health issues such as food and water security. He also mentioned

that the recent spread of the green growth strategy among the leading economies prompted Japan to adopt its own growth strategy coined as 'Green Innovation & Life Innovation'. He also stated that the 2001 landslide victory of the DPJ in the lower house elections led to the end of the era of LDP who had run the Govt. more or less continuously since 1955. He said that the new Govt. under DPJ has initiated a series of structural reforms of the gov. organizations to pick up where the previous regime had left since the 1990s. He, however, said that the DPJ Govt., like the previous LDP, has initiated these reforms without paying much attention to the problem revealed among R&D communities in the last decades. He has also revealed some fundamental problems associated with Japan's effort to restructure public R&D organizations.

Day fourth first session: "Inter Parliamentary Forum of Science and Technology and Innovation South Asia and Southeast Asia Region"

A message from Dr. A R Kidwai, Chairman, Zaheer Science Foundation, who was indisposed, was read out by Dr. Shahid Siddiqui, Section of Pulmonary & Critical Care Medicine, Pritzker School of Medicine, University of Chicago, USA. In his message Dr. Kidwai welcomed the participants, emphasised the need for deliberations on the Conference theme and looked forward to their comments and suggestions.

Dr. Lidia Brito, Director, Science Policy Division, UNESCO, Paris, expressed her satisfaction about the internationally wide-based representation and participation in the Conference. It was important to communicate the S&T practitioner's perspectives to parliamentarians and policy-makers, despite the differences in practice and policy. A multi-disciplinary approach is essential. S&T have wide impacts on society. There is need to provide more space to social and peoples perspectives in S&T policy formulation and implementation. UNESCO encourages and facilitates such interactions. The efforts by Zaheer Science Foundation and Dr. Mohsin U Khan, Secretary, Zaheer Science Foundation, in this direction are commendable.

Dr. Ninlawan Petcharapuranin, Senator of the Standing Committee on Science & Technology, Communication and Telecommunication, Thailand, presented a comprehensive brief overview of S&T policy formulation in his country. This included : The composition of the Senate; relevant S&T committees, their legislative authority, recommendations, duties, powers and supervisory administrative responsibilities; ranking in terms of S&T indicators; and sector wise R&D. The social-developmental issues of concern are: climate change, renewable energy sourcing, emerging diseases, ageing population, local community involvement and regional innovation systems among others. The S&T scenario over the next 10 years and manpower and budgetary implications were presented.

Mr. Narong Boonyasaguan, Advisor to the Standing Committee on Science and Technology, House of Representatives, Thailand, outlined the role and responsibilities of Parliamentarians in development with specific reference to S&T initiatives in Thailand. Standing Committees and Sub-committees of Parliament strategically focus on core issues of development of economy and society in general and biotechnology, advanced and alternative technology and Energy Environment in particular, based on national vision and missions. The latter include: enhancement of R&D capacity; advice to public and private sector; technology transfer to SMEs, legal and regulatory provision for technology commercialization,

monitoring of program etc. Besides, Thailand was pursuing technology and policy cooperation with her neighbours in Indo-China, and with USA and Japan, especially in respect of natural disaster management and climate change.

Prof. Saifuddin Soz, Member, Rajya Sabha (Upper House of Parliament), India, highlighted the importance of S&T in National development. He offered to facilitate scientists' interaction with more of knowledgeable and involved Indian Parliamentarians.

Shri S. S. Ramasubbu, Member, Parliamentary Standing Committee on Science and Technology, Govt. of India, observed that S&T can contribute to the development of all sectors. GOI, UGC, CSIR, among others, were actively promoting such development, especially in IT, healthcare etc. However, many unresolved issues related to economic and social impacts of Climate Change need to be addressed by scientists and policy makers. Younger people need to be encouraged to take up careers in science with a human face.

Dr. Paula Tiihonen, Committee Counsel to the Committee for the Future, Parliament of Finland, informed about her country's efforts to prioritize major S&T problems and issues and to suggest their resolutions.

Mr. Avudh Ploysongsang, Adviser to the Standing Committee on Science and Technology, House of Representatives, Thailand, highlighted the uneven distribution of benefit from new technology, especially GMCs. Government was too busy and relatively ignorant of the economic and social impacts of new technologies across sectors and regions. He proposed a high-ranking national chief technology officer, supported by elected representatives, to better inform the parliamentarians and decision makers about the causes and outcome of technological developments, especially in respect of food security and poverty.

Dr. Aqueil Ahmad, Core Faculty, School of Management, Walden University, North Carolina, USA, proposed on the basis of informal discussion with the participants, that the networks created by this and preceding biennial Conference on S&T may be formalized into a permanent International Forum, for continuing interaction among S&T practitioners and policy makers, supported by UNESCO, ZSF among others. To broaden such interaction, he suggested that next biennial S&T Conference in 2012 may be held in Petersburg. This suggestion was warmly welcomed by Dr. Svetlana Kirdinia, Institute of Economics, Russian Academy of Sciences, Moscow, Russia. Dr. Lidia Brito informed that UNESCO was supporting international and regional forums on S&T. She suggested that the present networks may link up with the UNESCO supported Budapest Global Forum. There was also a need to promote effective S&T dialogue at national levels and across regions.

The panel discussions which followed were about: how S&T Initiatives can help poverty alleviation; how to bring about greater social consciousness, civil responsibility and morality in S&T; how to address socio-economic challenges arising from demographic changes; how to identify good and bad S&T policies and practices; how to get parliamentarians to give more priority to S&T, without politicizing the scientists; how the Parliamentarians can deal with issues arising from the inflow of MNC's etc. The responses from the Panelists were: Scientists should not be politicized; needs of the elderly, alternative energy sources, and forest and environment should be addressed; Scientists should effectively and vibrantly communicate with policy makers on socio-economically relevant impacts of S&T. S&T should address development of SMEs. S&T should be bottom-up, not top down, and democratically, socially and morally accountable.

Concluding session: “Building Bridges through dialogue between Parliamentarians, Scientists, Media and Society

Dr. P Banerjee, Director, NISTADS, New Delhi, highlighted the role of scientists, parliamentarians and administrators, as their decisions impact down to the village level. S&T should contribute to more accessible and cheaper provision of public services.

Dr. Diana Malpede, UNESCO, historically traced the evolution of S&T policy since World War II. New and serious challenges have emerged during the current decade. Promoting dialogues and building bridges among scientists and policy makers are essential.

Ms Chandrika Nath, Parliamentary Office of Science and Technology, UK, stated that the awareness of Parliamentarians on S&T and related development concerns was very low. Scientists can help overcome this lacuna through information and advice.

Dr. N P Singh, Adviser, Ministry of New and Renewable Energy, Government of India, New Delhi, highlighted the development of renewable energy, including solar, biomass, wind, micro-hydel etc.

The session ended with some discussion and concluding remarks by the Chair.

Special recommendations were read out by Dr Mohsin U Khan, Coordinator of the Conclave which are following:

- There should be an Asia network of science policy researchers to interact among themselves and exchange information from time to time.
- The above network could organize training programs and workshops on science and technology policy and other related areas.
- The South Asian and South East Asian researchers could work out research programs on regional cooperation.

A big Conclave of scientists should be organized every year at different places in South Asia and Southeast Asian countries

Closing Remarks by Senator Dr. Nilawan Petcharaburanin

“It is an honor to be a part of the Conclave under the title ‘Regional cooperation in Science & Technology: Opportunities and Challenges in the context of Globalization’. This is quite an auspicious event. We have gathered people from all over the world, who are not only knowledgeable in science and technology but also considerate to the world we are living. We have addressed the essential global issues of climate change, science and technology and innovation policy, health service: developments in science and economics, impacts of science and technology on society, innovation management and technology transfer, and information and communication technology. This Conclave has given us a promising opportunity in utilizing science and technology at its best. We have successfully pioneered in unifying the ultimate solutions for making our world a better place. Because this planet belongs to all of us, we need to bring the world together as one. Thank you everyone for your great dedication to make this happen”.