19TH ISLAMIC WORLD ACADEMY OF SCIENCES CONFERENCE
on
Achieving Socioeconomic Development in the Islamic World through Science, Technology and Innovation (STI)

6-9 May 2013
Dhaka, Bangladesh

CONFERENCE REPORT[1]

Under the patronage of Her Excellency Sheikh Hasina, the Prime Minister of Bangladesh, the Islamic World Academy of Sciences (IAS) convened its 19th international science conference in Dhaka, the capital of the People's Republic of Bangladesh, during 6-9 May 2013. The theme of the conference was 'Achieving Socioeconomic Development in the Islamic World through Science, Technology and Innovation (STI).'

Held at the Pan Pacific Sonargaon Hotel in Dhaka, the IAS Conference was an open activity in which over 200 local and international participants representing over 40 countries participated. Among the participants were Fellows of the IAS, local scientists from the various universities, young university students, expatriate Bangladeshi scientists as well as representatives of Asian, African and Western academies of sciences. Prior to the conference, the 20th Meeting of the General Assembly of the IAS as well as the 39th Meeting of the IAS Council were arranged.

The 19th IAS Conference was organised and sponsored by:

- Islamic World Academy of Sciences (IAS), Amman, Jordan;
- Prime Ministry of Bangladesh;
- Foreign Ministry of Bangladesh;
- University Grants Commission of Bangladesh; and
- Bangladesh Academy of Sciences.

It was co-sponsored by:

- OPEC Fund for International Development (OFID), Vienna, Austria;
- Islamic Development Bank (IDB), Jeddah, Saudi Arabia;
- Ministry of Science and Technology of Bangladesh;
- OIC Ministerial Committee on Scientific and Technological Co-operation (COMSTECH), Islamabad, Pakistan;
- Arab Potash Company, Amman, Jordan;
- Incepta Pharmaceuticals Ltd., Dhaka, Bangladesh; and
- Bangladesh University of Health Science (BUHS), Dhaka, Bangladesh.

[1] Prepared by Dr Moneef R. Zou'bi, DG, IAS.

The conference addressed a number of key issues in the domain of science, technology and innovation (STI) for development, and represented an attempt by the IAS to engage the Bangladeshi decision-making and science communities and draw possible lessons from the Bangladesh experience that could be of benefit to the wider community of OIC-Member States.

Bangladesh, which is among the most populous of OIC countries, is a country that is regularly affected by natural disasters. Yet, it is a country that has managed to develop the capacity to mitigate and manage natural phenomena effectively, and achieve a respectable level of food security for its vast population.

As a result of some obvious strengths in certain export-oriented industrial sectors, it has also managed to maintain high economic growth. And although there is limited interaction between public and private-sector actors and little university–industry collaboration, the country's ingenuity manifests itself in light engineering where it is producing import-substitution products that are creating employment and alleviating poverty. Endogenous technologies include those related to ferries, power plants, machinery and spare parts.

Bangladesh is also developing the high-tech sector of pharmaceuticals, and is almost 97% self sufficient in pharmaceuticals. To get first-hand experience of this particular sector, the conference participants visited one of the leading pharmaceutical companies of the country; Incepta Pharmaceuticals.

The above factors rendered Bangladesh a special case-study for the IAS and the OIC science community.

The objectives of the 19th IAS Conference thus were:

(a) To discuss the key areas of public health and higher education in Bangladesh to draw possible lessons relevant to other OIC countries, while showcasing some of the country's key S&T sectors;
(b) To analyse how science and technology can contribute to addressing real challenges in the domains of water and energy in populous underdeveloped countries, and analyse how linkages between the private sector and the science community in general may be strengthened;
(c) To review cases where research in the frontier areas of biotechnology and information technology could be transformed into commercial ventures;

The conference which was inaugurated by the Prime Minister of Bangladesh on Monday 6 May 2013, was preceded on Sunday 5 May 2013, by a ceremony which was organised on the premises of the Bangladesh University of Health Sciences (BUHS), to honour one of the Founding Fellows of the IAS from Bangladesh: Prof. Mohammad Ibrahim (1911-1989). During the ceremony, Prof. Liaquat Ali, an outstanding Bangladeshi medical researcher, was honoured as the recipient of the 2013 IAS Ibrahim Memorial Award.

The inaugural ceremony of the conference included an address by H E Mrs Sheikh Hasina, the Prime Minister of Bangladesh; a speech by H E Dr Mrs Dipu Moni, the Foreign Minister of Bangladesh; an address by H E Prof. Ekmeleddin Ihsanoglu, the Secretary General of the Organisation of Islamic Co-operation (OIC); the message of Prince El-Hassan bin Talal of Jordan, Founding Patron of the IAS, which was read by Dr Adnan Badran; the message of the President of Pakistan, IAS Patron, which was read by Dr M A Mahesar, Assistant Co-ordinator General, COMSTECH; and the

opening address of Dr Abdel Salam Majali, former Prime Minister of Jordan and IAS President. The Chairman of the Bangladesh Universities Grants Commission, Prof. A K Azad Chowdhury; and Prof. A A Azad FIAS, IAS Fellow from Bangladesh who was the main local organiser of the event; also spoke during the session which was concluded with some closing remarks by H E Yeafesh Osman, State Minister of Science and Technology, Bangladesh.

The conference was divided into a number of main sessions: Thematic Keynotes, Excellence in Higher Education, Energy for the Future, Public Health, Drugs and Vaccines for the Future, Climate Change and the Environment, Rethinking Sustainable Development, Collaborative Research Case-Studies; as well as a panel discussion which was entitled 'Way Forward and Funding Strategies for the Future.'

The first academic session of the conference included keynote presentations by: Prof. Adnan Badran FIAS, Former Prime Minister of Jordan, whose presentation was entitled *Excellence in Higher Education for S&T Proficiency: A Global Perspective*; Prof. Atta-Ur-Rahman FIAS, President, Pakistan Academy of Sciences, who addressed the topic of *Higher Education S&T Nexus: Outlook for Tomorrow*; and Academician Dato Ir Lee Yee Cheong, Chairman of the Board of ISTIC in Malaysia, whose keynote was entitled *Building S&T Proficiency in Developing Countries: Ideas on the Hands on Approach.*

Prof. Badran indicated that a democratic environment of quality teaching and research based on merit, autonomous higher education institutions, appropriate funding and governance was an essential requirement for building S&T proficiency. Prof. Rahman, on the other hand, suggested that the three major players in the development of a knowledge economy were science and technology institutions (including universities), industry and the government. The development of a knowledge economy, he added, required a thorough understanding of the dynamic interplay between research, invention, innovation, and economic growth. Dato Lee's essential message was that building S&T proficiency was the raison d'être of the Inquiry Based Science Education programme (IBSE) of the InterAcademy Panel (IAP) as well as many science academies around the world.

The second working session of the conference included a presentation on the achievements of, and the difficulties faced by, the OIC Ministerial Committee on Scientific and Technological Co-operation (COMSTECH) by Dr M A Mahesar, Assistant Co-ordinator of COMSTECH. Also, the state of the higher education sector in Bangladesh was comprehensively described by Prof. A K Azad Chowdhury, Chairman of the UGC in Bangladesh, in his presentation.

Two world experts on renewable energy presented papers on renewable energy research in the third session of the day. The first, entitled *The Future of Renewables: Their Feasibility and Applications in Resource-Poor Countries*, was made by Prof. Saifur Rahman; Director, Virginia Tech Advanced Research Institute, USA. It focused on the future of renewable energy in "resource-poor" countries which were not endowed with significant extractable fossil-fuel energy resources. The second, by Prof. Marwan Khraisheh, Dean of Engineering, MASDAR Institute of Science and Technology, UAE, addressed the topic of *The Need for Multidisciplinary Research to Address Energy, Water and Climate Change Challenges,* and talked about the challenges of climate change, energy and water security, and how a dedicated response from the scientific and academic communities working in collaboration with industry and government, was required to develop innovative sustainable solutions to face up to such challenges.

The session on Public Health included a presentation by Prof. Abdallah Daar FIAS, Professor of Public Health Sciences and Surgery, University of Toronto on *Public Health Research, Policies and Funding Opportunities*, in which he emphasized the importance of mental health as an issue that should be addressed in many countries; a presentation by Prof. Ugur Dilmen FIAS, General Director of Health Research, Turkish Ministry of Health, and Editor of the Medical Journal of the IAS on *Public Health Research Funding and Policies in Turkey*; a presentation by Prof. Timothy Evans (Canada) of BRAC University, Bangladesh, which was entitled *Health Equity and Universal Health Coverage*; as well as a presentation by Prof. Muthana Shanshal FIAS, University of Baghdad, Iraq, on *The Public Health Food Safety Nexus: Carcinogenic Polyaromatic Hydrocarbons in Smut Wheat Infected with Tilletia Caries.*

The fifth working session of the conference represented an attempt to bridge the science and business community divide and addressed the topic of 'Drugs and Vaccines of the Future.' It included a presentation by Prof. Atta-ur-Rahman entitled *The International Centre for Chemical and Biological Sciences: An Example of the R&D Value-Chain*; a presentation by Prof. A A Azad FIAS, Incepta Visiting Professor, Bangladesh/ Australia, entitled *A Proposal for the Establishment of a Drug Discovery and Development Programme with Concomitant Capacity Development in the OIC-Member Countries;* as well as a presentation by one of Bangladesh's leading entrepreneurs, Mr Abdul Muktadir, the Founder and Chairman of Incepta Pharmaceuticals, who talked about his company which is one of the country's leading pharmaceutical manufacturers. The manufacturing facilities of Incepta were in actual fact visited by the participants in the conference on the afternoon of Tuesday 7 May 2013.

On the morning of Wednesday 8 May 2013, the session on 'Climate Change' included a presentation by Prof. Michael Clegg, Foreign Secretary, US National Academy of Sciences, who spoke on *The Climate Change Question: The Role of Scientists and Science Academies*. Prof. Clegg highlighted the pivotal role that science academies can play in bridging the divide between the science community and decision-makers.

That was followed by two outstanding research presentations by two of Bangladesh leading women scientists: Prof. Zeba I. Seraj, University of Dhaka; who presented a paper entitled *Production of Stress Tolerant Rice for Bangladesh by Use of Biotechnological Tools;* and Prof. Haseena Khan, South Asian University, New Delhi, India; whose presentation was entitled *From Marker to Gene: The Curious Case of a Putative vps51 Gene of Jute.*

The seventh session of the conference which was under the title 'Rethinking Sustainable Development' included a thought-provoking presentation by Dr Sandro Calvani, Asian Institute of Technology, Thailand, who talked about *Rethinking Sustainable Development in Least Developed Countries: The Politics Policies Nexus.* Dr Calvani talked about the new development vision that was emerging on the international arena which comprised eleven goals for global development, justice and peace. The goals include economic growth, food and water security as well as appropriate education, health, freedom as well as gender equality. That was followed by a presentation from Malaysia entitled *Food Security Initiatives for the Social Well Being of the Farmers: How Science Helps*, in which Prof. Aini Ideris FIAS, University Putra Malaysia; Prof. Khatijah Mohd Yusoff FIAS, Ministry of Science, Technology and Innovation; and Prof. Abdul Latif Ibrahim FIAS, University of Selangor (UNISEL), Malaysia; talked about the success of their long-term research project to develop

efficacious vaccines, including one for Newcastle disease -which is a serious disease affecting poultry- that has led to an expansion of the village chicken industry in Malaysia.

The session on 'Collaborative Research Case-Studies' was chaired by Mr Yeafesh Osman, State Minister of Science and Technology, Bangladesh; and included a presentation entitled *Radionuclide Research and Development Studies Under Bangladesh-German Cooperation*, by Prof. Syed M. Qaim FIAS, Research Centre Juelich; in which he highlighted the long history of cooperation between the Institute of Nuclear Chemistry of the Research Centre Juelich, Germany, and the Bangladesh Atomic Energy Commission (BAEC).

Dr Peter Sundin, of Uppsala University, Sweden, and Ms Tatjana Kuhn, German Agency for International Cooperation, on the other hand talked about *The International Science Programme in Bangladesh: Self Interest or Empowerment?* Dr Sundin highlighted that the International Science Programme (ISP) was devoted to building capacity for scientific research and higher education in basic sciences in developing countries, since 1961, in physics, and since 1970 and 2002 in chemistry and mathematics, respectively. He added that the outcome of the ISP programme over the previous three decades was substantial and went on to cite actual examples of ISP's collaboration with scientists in Bangladesh.

That was followed by a presentation by Prof. Mohammad Abdollahi FIAS, Tehran University of Medical Sciences, Iran; who spoke on *Ethical Issues in Scientific Publications, Role of the Committee on Publication Ethics (COPE),* and described the activities of the Committee on Publication Ethics (COPE) which was established in 1997 by a small group of medical journal editors in the UK, and yet in 2013 boasts a membership of 8500 from all academic fields.

Another example of research collaboration was presented by Dr Md. Feroz Alam Khan, Professor, Department of Physics, Bangladesh University of Engineering and Technology, who presented a paper under the title *Structural and Magnetic Properties of Core-Shell Manganese-Oxide Nanoparticles Fabricated by Inert Gas Condensation Technique.*

The last session of the conference was a very lively panel discussion chaired by Mr Yeafesh Osman, State Minister of Science and Technology of Bangladesh, and co-chaired by Dr Moneef R. Zou'bi, DG-IAS; in which Prof. Michael Clegg (USA), Prof. Bambang Hidayat (Indonesia), Prof. Abdallah Daar (Canada) and Prof. Khatijah Mohd Yusoff (Malaysia) took part.

The panellists discussed a number of issues including: science education, role of academies of sciences in raising awareness of scientific issues, the state of mental health in developing countries, climate change, how some countries such as Malaysia have adopted a national vision (Vision 2020), expanding the African Science Academies Development Initiative (ASADI) to include OIC countries, challenges of the 21st century including food security, climate change, funding science, young scientists and young entrepreneurs, nanotechnology for the future,…

The panel discussion was followed by the concluding session of the conference which was chaired by Prof. Mehmet Ergin FIAS, IAS Vice-President from Turkey.

At the conclusion of the 19th IAS Conference, the IAS adopted the IAS 2013 Dhaka Declaration on *Achieving Socioeconomic Development in the Islamic World through Science, Technology and Innovation.*

The declaration stressed that the quest for knowledge is one of the seminal elements in the Islamic code of belief, and that up to the turn of the seventeenth century, the

Islamic civilization was a milieu *par excellence* for groundbreaking science; science which laid the foundation for the European renaissance. It also reiterated that the world economic uncertainty of the previous five years has been the source of serious difficulties for the Science, Technology and Innovation (STI) sector.

The declaration highlighted that STI was not a mere academic pursuit and that in the wake of the financial crisis, STI will make a vital contribution to sustainable and lasting recovery and to longer term growth prospects of most countries' economies. It invited the decision-makers and the science community in OIC-Member states to share the view that science transcends political borders, enhancing cooperation and acting as a catalyst for consolidating stability in the Islamic world.

The declaration noted that Bangladesh has achieved over 90% enrolment in primary education, has managed to take a number of actions to mitigate the negative effects of natural phenomena, attain a reasonable level of food security for its population, and locally produce 97% of the medicinal drugs it requires. It highlighted that Average Gross Expenditure on R&D (GERD) for OIC-Member states has quadrupled to an average of 0.8% for OIC-Member states from the 2005 average which was 0.2%, and that twenty-five OIC universities are ranked amongst the world's top 500 universities according to the QS World University Rankings 2012/2013.

The operative part of the declaration stated that it was important that OIC countries speak with one voice on the world level, and that the decision-makers within recognize the crucial role of scientific research and higher education in their respective national policies and strategies for socio-economic development. The declaration also made a special mention of the vital area of raising public understanding and awareness of science highlighting –in the process- gender equality, social inclusion and participation.

It also called for partnerships between public and private sectors in the field of science, technology and innovation and encouraged public and private R&D organizations and universities to use public research infrastructures and utilities fully.

It is essential, the declaration reiterated that OIC countries focus on a limited number of priorities and regional smart specialization activities where some networks already successfully operate or some new ones may be developed, and consider the quality of statistical data on STI and the statistical system on research and development, as precondition leading to the development of sound and effective strategy in STI.

The declaration further called for the promotion of scientific and technological cooperation among developing and OIC countries and for the creation of links between knowledge generation and enterprise development. To further promote the development of local technology, OIC countries need to improve their incentive regimes including taxation and must try to promote technological innovation and generate markets for new products and services within their societies, the declaration suggested.

The creation of a Brain Bank by tapping into the enormous expertise possessed by expatriate scientists and technologists from the OIC-region was another recommendation proposed in the declaration. Another was the establishment of a consortium of existing and emerging centres of excellence in OIC-Member states. Such consortia could focus on areas such as Drug Discovery and Development or Energy or Information Systems; and can serve as a model for international research and information sharing among academics, professionals and policy makers.

Lastly, the declaration expressed the appreciation of the IAS to Her Excellency Sheikh Hasina, the Honourable Prime Minister of Bangladesh; and its thanks and appreciation to the People's Democratic Republic of Bangladesh and all the organizations and agencies that organised and sponsored the conference.

As part of the follow-up action to the conference, the Academy will circulate the IAS 2013 Dhaka Declaration to concerned individuals and relevant agencies throughout OIC and developing countries, so that measures are taken to put into action the ideas proposed at the conference.

The IAS also intends to work further with the two Bangladeshi champions of science it identified as a result of the conference, the medical scientist Prof. Liaquat Ali and the entrepreneur industrialist Mr Abdul Muktadir, to disseminate the fresh and exciting ideas of these two role models to young researchers and aspiring entrepreneurs throughout the Islamic and Developing world.

The IAS will also publish the complete proceedings of the conference in a quality volume that will be distributed internationally.

Through IAS Fellows, personal contact and correspondence, the IAS will promote the concepts promulgated at the conference among the decision making circles of the Islamic world, and will provide whatever help it can to get the various recommendations implemented.