National Consultative Workshop on Strengthening and Road Mapping of Emerging Technology Innovation Systems of Sri Lanka

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Colombo, Sri Lanka

Organized by
Asian and Pacific Centre for Transfer of Technology (APCTT)
of the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), New Delhi, India

In cooperation with and hosted by
Coordinating Secretariat for Science, Technology and Innovation (COSTI), Colombo, Sri Lanka

CONCEPT NOTE

BACKGROUND

Technological revolutions (waves) have provided opportunities for technology based national economic development that started from industrial revolution, transforming our society, culture and individual lives. UK, Europe and the USA advanced on the basis of the Industrial Revolution. Republic of Korea and Taiwan province of China caught the Electronics and ICT revolutions in the seventies and eighties. China, India and Cuba have caught on the technology based revolution. While Sri Lanka's per capita GDP was USD 320 as against South Korea's USD 84 in the 1960s, in 2012 South Korea exceeded USD 22,884 (being nearer USD 30,000) while Sri Lanka had attained only USD 3280.

The Republic of Korea invested 3.2% of its GDP in research and development, while Sri Lanka invested only 0.13% of its GDP. As a result Korea obtained over 5000 US patents per year over the last 10 years while Sri Lanka obtained only 1.8 patents per year. This is reflected in the fact that only 0.9% of Sri Lanka's exports are high technology, while Korea has 75%, Thailand 27% and Singapore and Malaysia exceed 50%. The greater high tech component in their exports has enabled these countries to emerge from poverty by accessing foreign markets and generating income. They have been able to transform their economies and substantially increased their GDP as high tech products generate higher profits.

Addressing the Problem

As a response and in order to address societal needs, Sri Lanka is investing in emerging technologies. Two key emerging technologies identified for development integration are

Nanotechnology and Advanced Materials, and Modern Biotechnology. Some elaboration on their local role is provided as follows:

1) Nanotechnology and Advanced Materials

The Sri Lanka Institute of Nanotechnology (SLINTEC) that has been established in partnership with the private sector has already applied for 8 US patents and 2 WIPO patents. A nanotech based slow release fertilizer is being commercialized with an Indian company. There are also plans to address natural raw material export based income generation, such as the export of Sri Lanka's Ilmenite used by developed nations to make titanium dioxide. While Sri Lanka gains 8 million USD per year by exporting Ilmenite, it spends 12 million USD per year on importing of titanium dioxide for our paint industry. Nanotechnology can assist the process of developing an industry that would add 250 times to the value of raw ilmenite by producing nano-titanium dioxide.

Ilmenite is just one of Sri Lanka's natural resources, other potential minerals such as graphite, dolomite, thorium, mica, quartz, feldspar and phosphate provide immense opportunities to develop value added products contributing to the rapid economic growth of the country. The challenge therefore is to find means of adding value to such resources for developing advanced materials which may contribute to the high technology export base in the country. Further, whilst Nano-based innovation is on stream, and even recently Sri Lanka obtained a patent for a Nano based elastomer clay composite, there is still a need to increase industrial applications of Nanotechnology.

2) Modern Biotechnology

Sri Lanka has identified the importance of establishing partnerships between agriculture, industry and health sectors as they all use biotechnological techniques encompassing transgenic organisms, enzyme material and gene therapy. If meaningful collaboration between the key actors of innovation are facilitated and strengthened, it will likely spur technology innovation with export implications. Recently the "GODA WEE" was mapped using next generation sequencing as a public private partnership by Human Genetics Unit, University of Colombo and John Keells Research Division. Biotechnology may also address areas of societal concern such land, water and air pollution and energy.

In a Sri Lankan context, biotech interventions in health care may relate to genomics, import substitution in relation to an annual import bill for vaccines amounting to LKR 400 million and stem cells (regenerative medicine). Industrial applications include the conversion of biomass into fuel and the dairy industry. Agricultural uses include the formulation of bio pesticides and transgenic crops and also enzyme production.

It would be evident from the above that certain initiatives to incorporate these two emerging technologies have already been taken. Accordingly it is envisaged that the consultative workshop will assess the progress made in these areas and propose how existing efforts may be supported and enhanced for national development.

OBJECTIVES

COSTI has through a series of workshops and round table discussions identified specific needs in the specified emerging technologies. The conference objectives follow on from this:

1. Understand the global and regional trends, (including the existing open innovation frameworks) in the identified emerging technologies.
2. Understand ways of assessing the impact made by the identified emerging technologies in Sri Lanka.
3. Understand the development potential for the identified emerging technologies (nano-technology and modern biotechnology) in Sri Lanka.
4. Through the interaction between international experts and local stakeholders propose a way forward for integrating emerging technologies in to national development. The way forward should address both private sector led corporate growth as well as national environmental challenges, as well as consider the capacity building required with relevant national monitoring mechanisms (with KPIs and indicators identified to manage the proposed technological growth).
5. Identify key strategies for strengthening R&D management and technology innovation for emerging technologies
6. Provide an understanding and a platform for Sri Lanka's private and public sector institutions to interact with international resources and to facilitate linkages that may harness emerging technologies.
7. Popularize the concept of 'open innovation'

PARTICIPATION

1. Sri Lankan scientists and representatives from scientific institutions in Sri Lanka.
2. Representatives from the Sri Lankan private sector including company management and private sector scientific research and development units.

3. Representatives of think tanks, policy makers and officials from the Sri Lankan private public sector overseeing or engaged with scientific development.
4. Representatives from Sri Lankan banks, venture capital companies etc that may finance scientific development.
5. Representatives from international donor and development agencies such as UNDP, ADB, World Bank, IFC, UNESCO and GIZ with offices in Sri Lanka.
6. International Resource Persons/Experts provided by APCTT and officials of APCTT.
7. Officials of COSTI.

STRUCTURE

1. The conference is scheduled to take place in Colombo over two and half days.
2. In order to meaningfully address the identified emerging technologies, and to ensure that participants are able to address their particular interest, the format will consist of plenary sessions, panel discussion and breakout groups relating to nanotechnology and advanced materials, and modern biotechnology.
3. The first day morning will consist of a welcome speech, keynote addresses and two introductory technical sessions. After lunch the participants will break-out into groups and will go on field visits until 6.00 pm. The field visits will be made to companies/institutions engaged with the specified technologies. In the case of the Nanotechnology and advanced materials break-out group, it is likely to be SLINTEC and Haycarb. In the case of the modern biotechnology group, they will visit Faculty of Medicine, Human Genetics Unit as well as a gene sequencing/diagnostics company.
4. The second day will consist of two morning technical sessions followed by break-out sessions during the afternoon.
5. A networking reception will be held during the evening of the 2nd day of the workshop.
6. On the third day morning, there will be presentations by the break-out groups on the progress made/deliberations of the break-outs. There will also be a presentation on linkages between the identified emerging technologies in the Sri Lankan context. A plenary discussion will be held on road mapping of emerging technology innovation systems for Sri Lanka.
7. The workshop will conclude with closing remarks made by representatives of APCTT and COSTI.

EXPECTED OUTPUTS

1. Workshop report incorporating the two separate reports on Innovation visit and deliberations of the break-out groups on nanotechnology and advanced materials

and, biotechnology. The amalgamation of the three reports and the report on the plenary session will be jointly compiled by the APCTT and COSTI.

2. Web Portal on the Conference.
3. Networking/ linkages facilitated by the Conference.
4. Framework for the development of roadmaps for the two high tech sectors

EXPECTED OUTCOMES

1. An assessment of the progress made and national impact of emerging technologies on Sri Lankan development.
2. An analysis to assist with a road map for further integrating the specified emerging technologies in national development.
3. An understanding of the human resources and infrastructure needs, support systems for techno-entrepreneurship and a monitoring mechanism for the execution of proposed road maps.
4. Proposals on National Innovation Projects (encompassing capacity building needs) on emerging technologies as per recommendations from the break-out groups and plenary sessions of the Conference.
5. Recommendations on national policy inputs to foster harnessing emerging technologies for national development.
6. Building of greater national awareness amongst key stakeholders of the existing and potential contribution of and the opportunities for open innovation with emerging technologies.
7. An understanding of the role to be played by international relations/ cooperation with respect to emerging technologies both regionally and in a global context.