United Nations Educational, Scientific and Cultural Organization

NATURAL SCIENCES

STI Policy for Sustainable Development – UNESCO's Perspective

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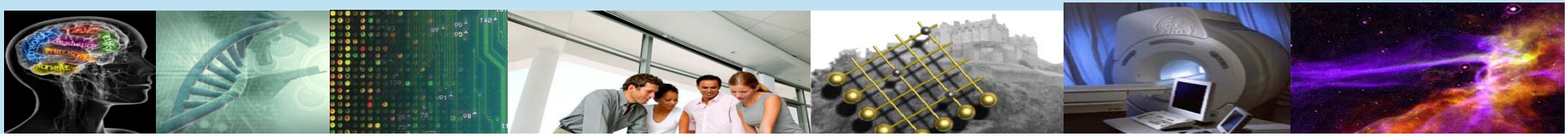


Central global challenge: Poverty

- “Poverty: incapacity to access and or use the resources that are available;
- “Vulnerability”: incapacity to react in time and in a way that reduces impact;
- Can STI help to reduce poverty and hence vulnerability?
- Can STI provide bridges between the different development actors?

What are the challenges in using STI for poverty reduction?

- Human resources
- Institution;
- Finance
- Coordination

Strategy and Actions

An integrated Approach on STI for Sustainable Development:

1. Strengthening of national capacities in STI policy formulation, evaluation and implementation at the forefront.

2. Promoting a culture of innovation.

3. Enhancing of human and institutional capacities in science and engineering, and

4. Improving STI system monitoring and foresight

1. Strengthening STI Systems and Policies

1.1. Building national capacities in STI policy planning, evaluation and reform

- Focusing on the integration of STI into national development policies and the economic reform agendas of countries, particularly with a view to facilitate the building of knowledge societies.

- Cooperating with Member States in developing new approaches for the formulation, evaluation and reform of STI systems and assisting in the elaboration of STI strategies and action plans;

- Strengthening institutional and human capacities in science policy and innovation governance.

1.2. Mobilizing broad-based participation in STI

The objective is to achieve a holistic architecture of policy design and implementation.

a. Popularizing science

- Expansion of citizen science,
- Democratization and transparency in the STI decision making process,

b. Promoting local and indigenous knowledge

- Recognize a central role for indigenous knowledge and community-based action in international environmental frameworks, to re-shape policy on biodiversity governance, natural disaster preparedness, and climate change adaptation;

c. Promoting science diplomacy

- Science as a vehicle for enhanced dialogue, mutual understanding and peace, this reflects the evolving role of foreign policy as a result of the new global landscape of S&T.

1.3 Strengthening international, regional and South-South cooperation STI policy

a. World Science Forum (since 2003)

- the Forum is the widest international platform for parliamentarians, scientists, policy makers and members of civil societies to engage in a dialogue about science.

b. STI Parliamentarian Policy Fora

- designed to assist parliamentary institutions in developing countries to tackle issues related to STI.

c. Reinforcing South-South Cooperation on STI Policy

- Since 1991, UNESCO has assumed responsibility for administering TWAS funds and personnel.
- In 2008, establishing the *International Centre for South-South Cooperation for Science, Technology and Innovation* in Kuala Lumpur.
- in 2012, established a UNESCO Chair at the Beijing Institute of Technology and the Chinese S&T Exchange Centre, focus on climate chaneg

2. Promoting a Culture of Innovation

Definition of Innovation

- Innovation is a critical factor for enhancing economic growth and competitiveness.

- Innovation is crucial for social cohesion, equality and poverty alleviation.

- UNESCO's vision on innovation:

- "Innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations" (OECD, 2005).
- UNESCO insists on the importance of grassroots innovation as an equally important source of solutions to meet the needs of developing countries.

Innovation issues in developing countries (1)

- ***Fragmented businesses:*** In general, developing countries have a heterogeneous economy with a large number of micro-enterprises operating in the informal sector. There are a number of foreign-based firms, which tend, to be disconnected from the rest of the economy.

- ***Inexistence of research centers or a very limited research facilities***:
  - the existing research facilities, such as university system poorly connected to local realities, particularly to labor market needs and opportunities;
  - lack of technological support services and infrastructure (metrology, quality control, standards, etc);
  - low levels of R&D in the business sector.

- ***Low educational levels***: it is a significant barrier to the development and diffusion of innovation in these countries.

Innovation issues in developing countries (2)

- ***Weak infrastructure***: There is the issue of a lack of telecommunication and transportation infrastructure;

- ***Poor system of governance***: A lack of financial transparency and bureaucratic red tape are the common problem in developing countries.

- ***Almost inexistent innovation policy***: There are only a very few developing countries that have innovation policies or strategies in place. If any, most of the innovation initiatives in developing countries are hi-tech oriented that do not meet the needs of the poor or the marginalized.

2.1. Facilitating the development of innovation systems (1)

A key challenge in promoting technological innovation in developing countries is the lack of an appropriate innovation system. The existing system is NOT optimized facilitate the interaction among key actors.

Building an innovation system in developing countries is complex, it involves the formal sector -- enterprises, universities, research institutes, the government and the financial system – along with non-governmental organisations and the informal sector, including grassroots inventors, local and indigenous knowledge.

An effective innovation system should allow private companies to generate wealth. It should also improve the living conditions of the poor.

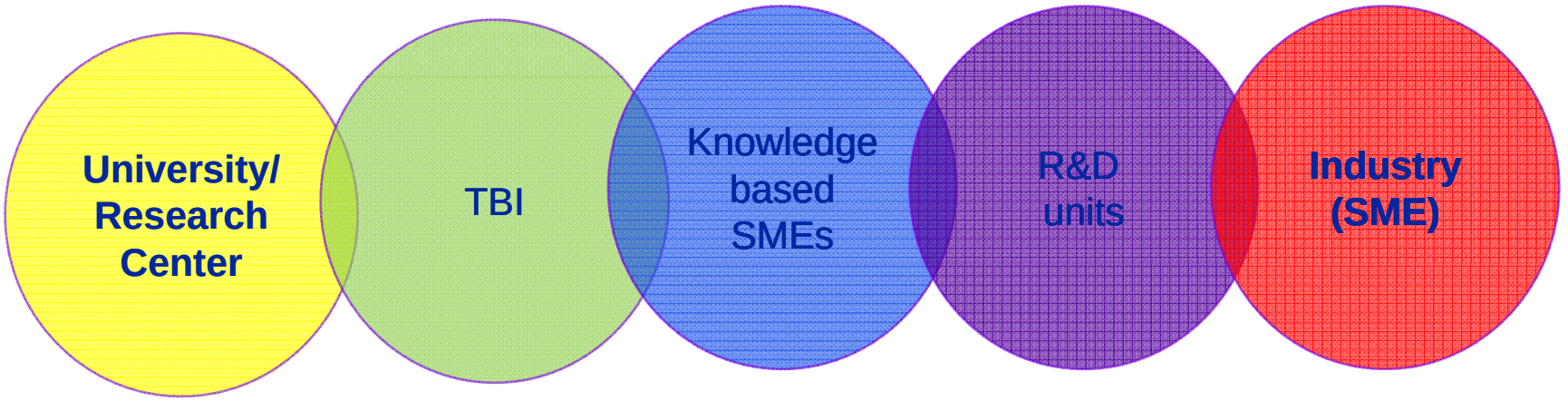
2.2. Promoting firm-based innovation – Supporting the development of science parks and technology incubators

- In 1993, UNESCO launched the *University-Industry Science Partnership Programme* (UNISPAR). Its objective is to create synergy between research in universities and in the productive sector.

- Supporting science parks and technology business incubators by providing technical assistance, organizing capacity building activities and developing pilot projects.

- The ultimate goal is to develop national capacity in creating, nurturing and managing knowledge-based SMEs

Mechanism - creation knowledge-based SMEs



Science Park and Technology Business Incubator

2.3. Promoting inclusive innovation for sustainable development – Grassroots Innovation

- Innovation can be a critical tool to deal with poverty and promote social inclusion.
- The current systems of innovation are not optimized for reducing poverty because they were designed primarily to achieve economic growth and improve competitiveness;
- A pro-poor innovation system is a multi-stakeholder social learning process that generates new knowledge, puts it to use, and expands the capabilities and opportunities of the poor;
- Inclusion of the poor in every step of innovation process is the key of success in the pro-poor innovation concept.

Grassroots, Human-Cantered Innovation

UNESCO is elaborating a new strategy to promote grassroots, human-centered innovation:

- It focuses on empowering people to use science and technology to find affordable solutions to meet the needs of the disadvantaged;

- It includes developing cross cutting activities within UNESCO's Natural Sciences Sector, involving the popularization of science, technopreneurship development, engineering, local and indigenous knowledge, biodiversity conservation, natural resource management, and disaster risk reduction

3. Building capacity in science and engineering

- Science and engineering education are important for all countries to raise public literacy of science, engineering and technology, and to generate the workforce for the future.

- UNESCO works with with national governments, UN system as well as intergovernmental and NGOs to promote training and research, scientific networking, and to create and strengthen centres of excellence.

- Public-private partnerships are essential for effective STI: UNESCO is elaborating several agreements with private companies to jointly promote STEM education, among others with Intel, F.Hoffman-La Roche Ltd., and Airbus

Key Actions in Science Education

1. Fostering science education
2. Strengthening engineering research capacity
3. Promoting women's participation in STI

4. Improving STI Monitoring and Foresight System

4.1. New initiatives on building a multi-dimensional, comprehensive and policy-relevant picture of STI

- Measuring STI is fundamental for the formulation of national STI strategies.

- The absence of relevant indicators is a major obstacle for the design and implementation of science and STI policies, especially in developing countries.

- To tackle this challenge, UNESCO has recently launched:

  - Science, Technology and Innovation Global Assessment Programme (STIGAP)

  - Global Observatory on Science, Technology and Innovation Policy Instruments (GOSPIN).

4.2. STI Foresight

- Foresight is important to support government and industry with the information and analysis required for timely decisions and strategic planning.
- It allows for more robust policies and sharper precision in prioritization of research activities.
- For these reasons, most developed countries are already leveraging on foresight to chart their national development.
- UNESCO is encouraging all Member States to develop foresight capacities, as part of their STI monitoring and evaluation system.

Creation of CISTRAT

International Research and Training Centre for S&T Strategy (CISTRAD) in Beijing as a category 2 centre under the auspices of UNESCO.

- CISTRAT will host international network of STI policy research centres;

- Conduct training on STI monitoring and foresight

4.3. Reinforcing the dissemination of knowledge in STI policy

- *UNESCO Science Report*
- *Encyclopedia of Life Support Systems (EOLSS),* an Internet-based encyclopaedia.
- *Engineering: Issues, Challenges and Opportunities for Development (in 2011)*.

Conclusion

- Our strategy seeks to improve national and regional capacities in STI policy formulation, implementation, evaluation and reform, and also to establish an information support system for STI policy. By mobilizing broad-based participation in STI policy.

- We focus on the development of a culture of innovation - promoting firm-based innovation through science parks and technology business incubators and supporting grassroots innovation from local communities.

- Science and technology education is a core pillar of our work – to engage young minds at an early age, especially girls, and to support their progress to pursue careers in science and engineering.

- We back our work with support to STI monitoring and foresight system in order to promote evidence-based STI policy.

Thank you