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UNESCO-COMSATS Potential Fields of Cooperation: STI for Sustainable Development in the South

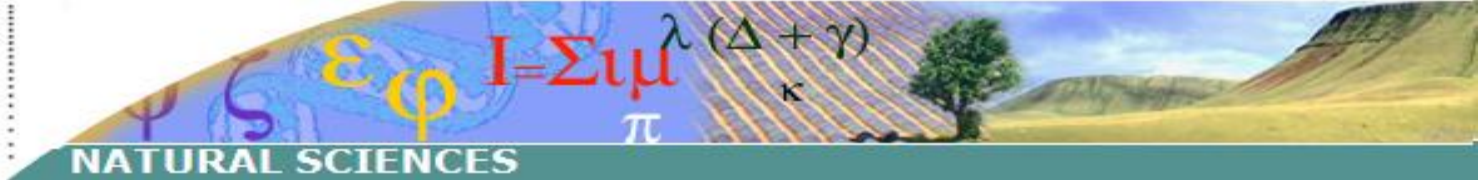
Dr Yoslan Nur
Programme Specialist
UNESCO

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1. Introduction

Opportunities in using STI for sustainable development in developing countries

- STI are increasingly recognized as being fundamental to achieving sustainable development.
- A number of developing countries have used STI to improve production and productivity of agriculture and industries, to meet healthcare needs and to overcome environmental challenges.
- Several developing countries have experienced rapid economic catch up, including Chile, China and Republic of Korea. These countries were able to absorb and creatively adapt international technological knowledge, and achieve accelerated growth.
- Great potential of technological appropriation by **doing, utilizing and interacting** (DUI) approach, existence of indigenous knowledge and grass-root innovation.

Issues in using STI for sustainable development developing countries (1)

- **Almost inexistent innovation policy:** There are only a very few developing countries that have STI policies or strategies in place. If any, most of them have difficulty to implement
- **Very limited or inexistence of research centers or research facilities:** The existing research facilities, such as university system poorly connected to local realities, particularly to productive sector. Low levels of R&D in the business sector.
- **Fragmented businesses:** In general, developing countries have a heterogeneous economy with: a large number of micro-enterprises (informal sector), SMEs, big companies (FDI).

Issues in using STI for sustainable development developing countries (2)

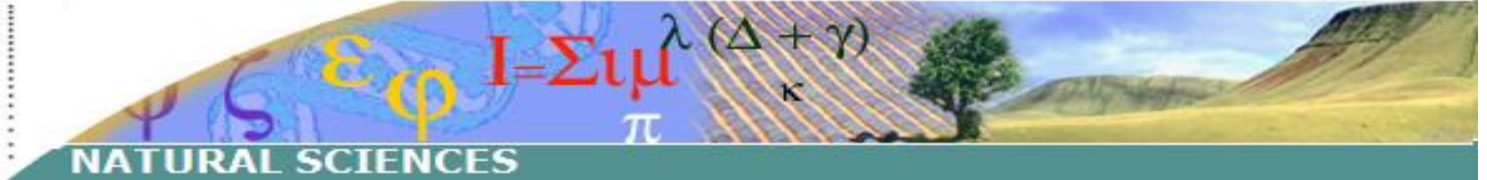
- **Human resources:** low educational levels, brain drain and decrease of interest to learn science and to have scientific and engineering career.
- **Weak infrastructure:** There is the issue of a lack of telecommunication and transportation infrastructure;
- **Poor system of governance:** A lack of financial transparency and bureaucratic red tape are the common problem in developing countries.
- Inexistence of **the financial support system** for innovation.

Integrated Approach on STI for Sustainable Development

1. Strengthening of national capacities in STI policy formulation, evaluation and implementation.
2. Promoting a culture of innovation.
3. Enhancing of human and institutional capacities in science and engineering.
4. Improving STI system monitoring and foresight by developing a multi-dimension a comprehensive and policy-relevant assessment of the STI system.



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2. 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

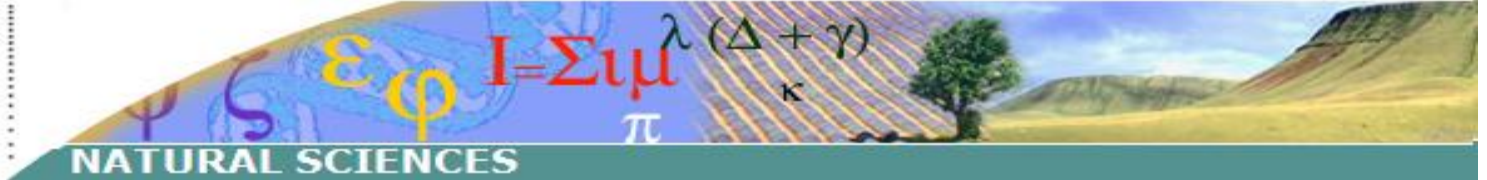
- a. **Popularizing science**, towards the expansion of citizen science, and democratization and transparency in the STI decision making process,
- b. **Promoting local and indigenous knowledge**
Recognize role for indigenous knowledge and community-based action to re-shape policy on biodiversity governance, 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) and Global Innovation Forum (beginning 2014)**
- 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 ISTIC in Kuala Lumpur.



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3. Promoting Culture of Innovation

2.1. Facilitating the development of innovation ecosystem systems

- Key challenge in promoting technological innovation in developing countries is the lack of an appropriate innovation system.
- 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 and also improve the living conditions of the poor.

2.2. Promoting firm-based innovation – Supporting the development of SP and TBI

- Supporting science parks and technology business incubators by providing technical assistance, organizing capacity building activities and developing pilot projects.
- Regional Centre for the Development of Science Parks and Technology Business Incubators, Category 2 Centre, under the auspices of UNESCO, in Isfahan, I.R. Iran.
- The ultimate goal is to develop national capacity in creating, nurturing and managing knowledge-based SMEs

Grassroots, Human-Centered Innovation

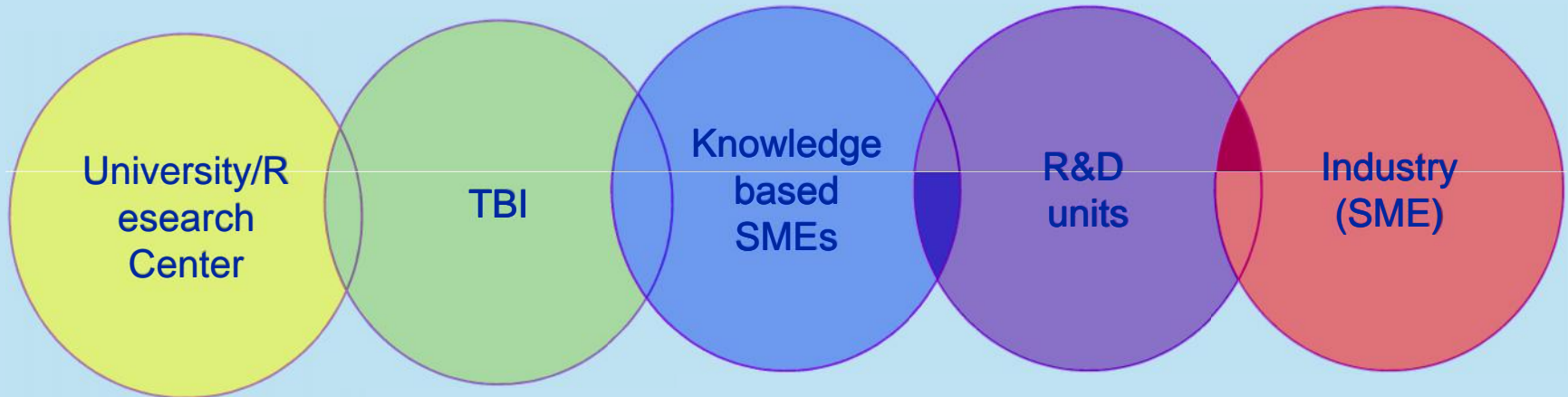
- Grassroots innovation is primarily a bottom-up approach of pro-poor innovation
- It is a bottom-up solution that responds to the local situation and the interests and values of the communities involved
- The output of a grassroots innovation is a cost-effective product or service that meets local community needs. Some of them are based on indigenous knowledge, like medicine.
- Human-centered design for sustainability is essential



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Mechanism - creation knowledge-based SMEs



Science Park and Technology Business Incubator

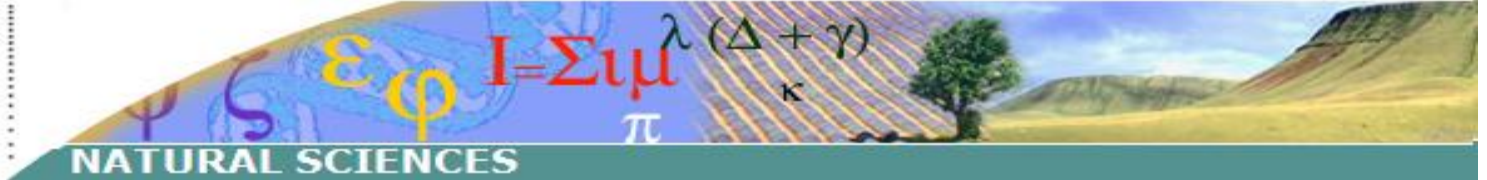
Source: M. K. Eghbal, 2011

3.3. 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.



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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



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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.

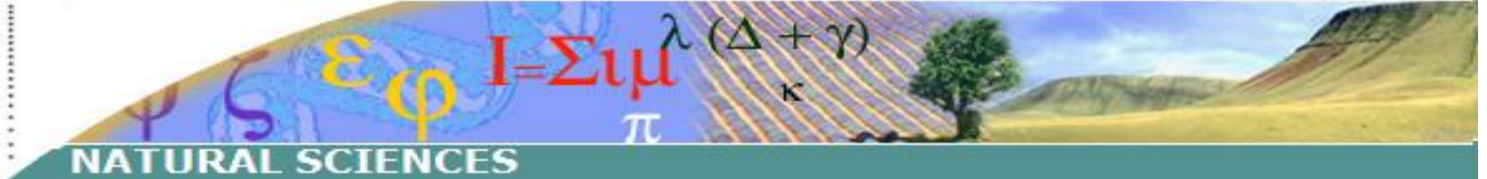
Establishment of CISTRAT

International Research and Training Centre for S&T Strategy (CISTRAT) 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



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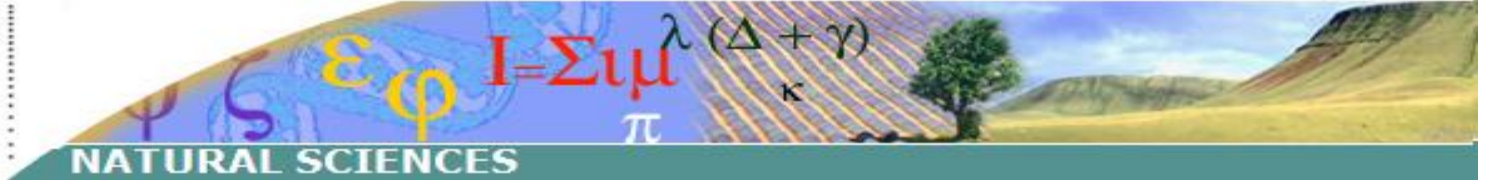


5. Conclusion

There is a huge spectrum for the cooperation between UNESCO and COMSATS in STI for Sustainable Development.



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Thank You