



# *Perspectives on Science, Technology and Innovation for Sustainable Development*

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## Outline

- UNESCO's vision of STI for sustainable development, and what we bring to the table
- Changing landscape of international science and engineering and implications for strategies for sustainable development
- What are some of the key problems that have been hobbling the progress of the international community?
- Where do we need to go from here, including in the definition of the Sustainable Development Goals?

## STI for Sustainable Development: UNESCO's Vision

- Spans a broad range: from the most basic sciences through practical engineering applications, and including social sciences, health sciences, agricultural sciences, as well as environmental sciences and “green technologies”;
- Must include strong focus on poverty eradication, through innovation, entrepreneurship and job creation;
- Fundamental foundations include sound STI policies, human and institutional capacity-building; enhancing popular participation and support; **transformations in higher education**
- Requires new multi-sector approaches to the **integration** of research, education, and local economic development;
- Calls for new models of international collaboration in all of the above.

## Science at UNESCO: Meta-goals

- Mobilize collaboration on scientific topics that intrinsically **require** large-scale multinational cooperation, e.g. oceans, freshwater, biodiversity, etc.
- Assist member states in building **capacity** to meet their own goals for **strengthening STI ecosystems in service to society**
- Focus on areas where we can **realize** the broader goal of “science for peace”, e.g. efforts in transboundary aquifers, science diplomacy.

## Sciences at UNESCO: Our Strengths

- Strong existing programs, e.g. in ocean and fresh water sciences (IOC and IHP); ecological sciences (MAB); geological sciences (IGSP); basic sciences (IBSP); science policy; indigenous knowledge
- An incredible network of UNESCO-related institutions, including the International Center for Theoretical Physics (ICTP), the Academy of Sciences for the Developing World (TWAS) (both in Trieste), the UNESCO-IHE, in Delft, and 30 “category 2” centers around the world.
- Very competent, energetic and creative field offices - the main science bureaus are in Cairo, Jakarta, Montevideo, Nairobi and Venice, but we also have science officers in 53 countries
- 300+ UNESCO Chairs around the world with science research foci

## Sciences at UNESCO: Our Strengths, 2

- Network of sites, e.g. MAB sites, World Heritage, geoparks
- Relationships with member states: permanent delegations at UNESCO, **national commissions**, national committees for various programs
- New cross-cutting initiatives: in Engineering, Biodiversity, Disaster Risk Reduction and Science Education.
- Intersectoral character of UNESCO: having education, natural sciences, social sciences, culture and communication in one house
- Our extensive family and credibility; We have a very broad convening power in science, as a **neutral** base for “networks of networks”

Recently asked by UN Secretary General Ban Ki-Moon to convene and host the secretariat for a high-level “**Scientific Advisory Board**” to serve him and the UN system as a whole.

## Changing landscape of science and engineering:

- Changes in the morphology of international participation and leadership
- Dramatically increasing urgency of challenges facing the planet
- Changes in the nature of the **practice** of science and engineering;
  - Increased blurring between disciplinary boundaries
  - Enhanced international partnerships
  - Increasing **necessity** of multi-sector partnerships – public sector, private sector, academia, etc.
  - The “Fourth Paradigm” – data-intensive science and engineering
  - Emergence of possibilities for “citizen science”
  - Enhanced focus on the policy dimensions of our work

## Key problems hobbling our community

- A conceptualization which divides “science”, “technology” and “innovation” (and hardly ever mentions “engineering”)
- Lack of coordination among int’l bodies, notably among UN agencies
- Inability to harvest lessons from past failures and successes
- Focus on short and mid-term issues, rather than on long-term issues of capacity-building worldwide
- Limited success in enhancing participation of groups historically underrepresented, including women, and in incorporating local and indigenous knowledge systems.
- **Failures of imagination:** in particular in linking our work on SMET education to the research agenda and to the agenda for grassroots innovation and local economic development.



## Where do we need to go from here?

- We need to create new models for multinational funding for building capacity in STI for development worldwide; *Future Earth* is one model; many other models need to be catalyzed and funded.
- We need to avoid a false dichotomy; of course STI is an underlying enabling element of almost all of the potential SDGs, but that **does not mean** that we do not need a separate goal, with specific targets and milestones, for “harnessing and enabling STI capacity worldwide”

## Where do we need to go from here, 2?

- For both a “general STI goal”, as well as the incorporation of STI in other goals, e.g. water, education, biodiversity, poverty reduction, etc., we need to design the targets to be concrete and measurable
- But we should not hesitate to set additional goals goals that are hard to measure – the processes of learning how to measure progress towards these goals will move our communities forward.