**TST Issues Brief: Science and Technology, Knowledge-sharing and Capacity-building[[1]](#footnote-1)**

 Draft Annotated outline, UNESCO, 29 July 2013

1. **Stocktaking**

**Science and Technology (S&T), Knowledge-sharing and Capacity-buildinghave a key role in poverty eradication and sustainable development**

* Science, Technology and Innovation (STI) has emerged as ‘the game changer[[2]](#footnote-2)’of the socio-economic situation of developing countries and a stabilizing tool for the economies in transition.
* Investment into knowledge systems, including Research & Development (R&D) has continued to expand globally, including in developing and emerging countries; the stock of knowledge in general has increased and new players have emerged[[3]](#footnote-3).
* There is a growing emphasis on the relationship between knowledge, innovation and growth. The importance of STI policy in facilitating sustainability and green technologies is being emphasized in the Arab region and sub-Saharan Africa.
* The internationalization of research creates spillover effects on the mobility of skilled labour, as well as of scientists and academics, and is an important mechanism for knowledge and technology transfer.
* STI capacities are important prerequisites for structural and social transformation that enable economic growth, human development and poverty reduction.[[4]](#footnote-4)
* The reappraisal and consideration of local and indigenous knowledge systems and environmental management practices are increasingly recognized as important components in policies and programmes to preserve and manage natural resources.
* ICTs have revolutionized the ways in which knowledge is created, diffused and applied. There is an inextricable link between STIs and the building of inclusive and pluralistic knowledge societies.

**Access to (the benefits of) S&T and knowledge is unequally distributed within and among countries**

* Developing countries, particularly Least Developed Countries (LDCs), Small Island Developing States (SIDS) and Post Conflict and Post Disaster countries continue to lag behind in Gross Domestic Expenditure on Research and Development (GERD) and in international collaborations in science. [[5]](#footnote-5)
* In many parts of the world, women participation in science remains under-represented.[[6]](#footnote-6)
* Millions including persons living with disabilities, women, and people living in remote communities continue to face barriers preventing their access to science education and to STI driven ICTs. The need forsufficient infrastructure, especially ICTs, was also highlighted in several reports.[[7]](#footnote-7)
* In many parts of the world, scientists are unable to maximize their potential because of the fettered sharing of and access to scientific knowledge.
* Science and scientific cooperation still needs to be globally inclusive.

***Lessons learnt from the MDGs***

* A substantial reorientation of development policies to focus on the use of new and established S&T knowledge was recognized to be key for meeting the MDGs.[[8]](#footnote-8) Key areas for policy action for effectively applying STI to achieving the MDGs such as: focusing on platform (generic) technologies or improving infrastructure services and higher education in science and engineering have been addressed in a number of countries, but much remains to be done in order to harness the potential of STI for advancing sustainable development.
* The MDGs did not include any goal related to innovation and technological developments, aspects which have a very critical role in sustainable use of natural resources especially in developing countries.[[9]](#footnote-9)
* Making the benefits of technologies, particularly ICTs, available to all was included as a target[[10]](#footnote-10) in the MDGs. While this target may be considered achievable by 2015 when it comes to the evolution of the ICTs sector and access to mobile services[[11]](#footnote-11), the potential of ICT’s as important enablers of sustainable development has yet to be fully used.

***Emerging challenges***

* STI and knowledge sharing should be more effectively targeted to address the challenges of poverty eradication and sustainable development and to manage the exploitation of resources within the boundaries of the sustainable functioning of the earth system:
1. agriculture and food security
2. health
3. sustainable energy for all
4. water and sanitation
5. healthy Ocean
6. biodiversity
7. climate change adaptation, mitigation and disaster risk reduction
8. employment and decent work
9. desertification, land degradation and drought
* Knowledge and technology transfer requires creating intellectual property regimes that encourage innovation and collaboration while protecting the innovation results.
* Lasting progress requires a comprehensive approach to development which includes a commitment to facilitate open access to scientific information and an inclusive broadband policy and empowering citizens to tap into and leverage the rich reservoirs of creativity and ingenuity, including traditional and indigenous knowledge.
* Stronger political will is needed alongside other commitments made for the strengthening of national and global STI systems.
* The increasing pace of technological innovation raises ethical questions about the development and use of STI.

***Opportunities***

* To harness the potential of STI, knowledge-sharing and capacity-building for poverty eradication and sustainable development, **enabling legal, policy, financial and institutional frameworks** should be created at the national, regional and international levels fully incorporating women and youth.
* **Quality education**, including strengthening science education at all levels, technical and vocational training, and teacher training, was identified as important in the regional consultation in Africa[[12]](#footnote-12) and during the sessions of the OWG; moreover, knowledge societies cannot develop without investments in centers of knowledge and learning at the tertiary level.[[13]](#footnote-13)
* **STI capacities** are important prerequisites for structural and social transformations that enable economic growth, human development and poverty reduction.[[14]](#footnote-14) Training needs, in particular for vulnerable groups and least developed countries (LDCs), and the development of skills on emerging sectors and new technologies should be duly addressed.[[15]](#footnote-15)
* The consultations call for a new development framework to promote **transfer of knowledge and technology**[[16]](#footnote-16)andfor increased cooperation in the area of technology transfer.[[17]](#footnote-17)
* **ICTs**,including open platforms can significantly advance science in many fields, by promoting access by scientists to each other’s findings, harness multidisciplinary collaborations among them, scale-up innovative ideas, and support innovation and the diffusion and transfer of technology throughout the world. Digital platforms following the Free Open Source Software (FOSS) offer ample opportunities for increased competition, access, and diversity of choice.
* **Open access** to scientific knowledge and the free flow of information should be expanded in order to bridge the knowledge gaps within and among societies, facilitate economic growth, social cohesion, and promote good governance. [[18]](#footnote-18)
* **Multidisciplinary approaches**, bringing together natural and social and human sciences as well as traditional and indigenous knowledge are needed to efficiently address sustainable development challenges at all levels, from local to global, with the participation of scientific community, civil society and the private sector in the scientific process[[19]](#footnote-19).
* **National STI policies and systems** will need to be designed within the context of national strategies and action plans for sustainable development; they must be strategically linked to education, macroeconomic and industrial policies as well as other efforts to increase capacities for science, innovation and green technology development.[[20]](#footnote-20)
* A strengthened **science-policy-society** **interface** is a critical sustainable development enabler.[[21]](#footnote-21) One approach is through scientific assessments, which are science-driven processes aimed at bearing the findings of scientific research and monitoring to meet the needs of policy-makers.
* **New global partnerships,** including Public-Private Partnerships (PPP), and South-South collaborations, should emphasize the role of scientists and academics as essential for the Post-2015 Development Agenda, and promote developing and the sharing of innovations[[22]](#footnote-22). Partnerships with local and vulnerable communities, including indigenous people and women, should be also be pursued. Strengthening science diplomacy provides opportunities to build scientific cooperation on issues that no single country can address alone. [[23]](#footnote-23)
* A **data revolution** for sustainable development is necessary, and a Global Partnership on Development Data should be established.[[24]](#footnote-24) Enhanced **statistical capacity** was identified as a development enabler during the African regional consultations.[[25]](#footnote-25)

**2. Overview of proposals**

Several proposals for integrating science- and technology-related targets into the Sustainable Development Goals (SDG) framework have been made so far. Proposals either put a stand-alone goal on science and technology forward or propose science- and technology-related targets under other development goals.

1. **An SDG on science, technology** **and innovation** (*see existing proposals in Annex II)*
2. **Inclusion of science and technology aspects under other SDGs** *(see existing proposals in Annex II)*
3. **Way forward**

The benefit of proposing a stand-along SDG on Harnessing Science, Technology and Innovation (STI) for Sustainable Development is that such a Goal would cut across most of the other SDGs while assisting with, in particular, the development and operationalization of national STI strategies and action plans for sustainable development and; increased innovation capacities for sustainable development, green technology transfer and scientific capacity-building in developing countries.

Mainstreaming STI into SDGs related to specific issues, systems and sectors of society appears to be a necessary requirement for promoting knowledge-sharing and for building capacity to face the multiple challenges posed by sustainable development.

Specific goals, targets and indicators could be developed around the following priority areas:

* Tertiary and science education/STI capacity-building;
* Open access to scientific information/data revolution;
* Investment in R&D as percentage of GDP;
* STI polices as holistic frameworks (knowledge sharing, linking knowledge systems and enterprises, and strengthening and monitoring sustainable development processes such as the SDGs);
* Partnerships/International scientific cooperation to strengthen the scientific and engineering capabilities of developing countries; support the creation and dissemination of technologies;
* Overcoming gender barriers in science;
* Promoting science diplomacy;
* Defining and implementing new financing mechanisms for STI, knowledge sharing and capacity-building.
1. The Technical Support Team (TST) is co-chaired by the Department of Economic and Social Affairs and the United Nations Development Programme. The preparation of this Issues Brief has been led by UNESCO. Contributors to this brief include: ITU, WFP, WIPO, UNAIDS, UN-WOMEN, WTO, UNDP, WB, WMO. [↑](#footnote-ref-1)
2. Bokova, Irina, ‘An integrated Policy Approach in Science, technology, and innovation for sustainable Development’, INSEAD-WIPO, The Global Innovation Index 2012. [↑](#footnote-ref-2)
3. Ibid. [↑](#footnote-ref-3)
4. Report of the Secretary-General on “*Science, technology and innovation, and the potential of culture, for promoting sustainable development and achieving the Millennium Development Goals*” for the 2013 Annual Ministerial Review of ECOSOC (referred to hereunder as ‘ UN SG Report, AMR ECOSOC 2013). [↑](#footnote-ref-4)
5. “The most important innovation gaps are between countries at different stages of development. On average, high-income countries outpace countries with lower per capita income by a wide margin in all innovation performance metrics. Around 70 per cent of R&D spending worldwide still takes place in high-income countries. Although middle- and low-income developing economies have increased their share of global R&D expenditure and patent applications, most of this increase is accounted for by East Asia. Gains have been more modest in other developing countries.” UN SG Report, AMR ECOSOC 2013. [↑](#footnote-ref-5)
6. Of the world's total science researchers, only 27 per cent are women (estimation by UNESCO Institute for Statistics, UIS), 2012. [↑](#footnote-ref-6)
7. See for example: Post-2015 Development Agenda: Goals, Targets and Indicators, CIGI and KDI, 2012 or The post-2015 delivery of universal and sustainable access to infrastructure services, Overseas Development Institute, 2013. [↑](#footnote-ref-7)
8. UN Millennium Project 2005. *Innovation: Applying Knowledge in Development*.Task Force on Science, Technology, and Innovation. [↑](#footnote-ref-8)
9. Statement by Troika (Italy, Spain and Turkey), 2nd session of the OWG, 17-19 April 2013. [↑](#footnote-ref-9)
10. Target 8.F:  In cooperation with the private sector, make available benefits of new technologies, especially information and communications [↑](#footnote-ref-10)
11. 74 per cent of inhabitants of developed countries are Internet users, compared with only 26 per cent of inhabitants in developing countries; the number of mobile cellular subscriptions worldwide by the end of 2011 reached 6 billion. [↑](#footnote-ref-11)
12. Outcome Documents of the Regional Consultations on the Post-2015 Development Agenda, UNECA, 2013, and; Dakar, Senegal (10-11 December 2012), UNECA, AUC, AfDB, UNDP. [↑](#footnote-ref-12)
13. An Action Agenda for Sustainable Development, SDSN, 2013. [↑](#footnote-ref-13)
14. UN SG Report, AMR ECOSOC 2013. [↑](#footnote-ref-14)
15. Statement by Troika (Italy, Spain and Turkey), 4th session of the OWG, 17-19 June 2013. [↑](#footnote-ref-15)
16. The Global Conversation Begins, UNDG, 2013. [↑](#footnote-ref-16)
17. The Global Conversation Begins, UNDG, 2013. [↑](#footnote-ref-17)
18. Target 8.F: In cooperation with the private sector, make available benefits of new technologies, especially information and communications [↑](#footnote-ref-18)
19. UN SG Report, AMR ECOSOC 2013. [↑](#footnote-ref-19)
20. UN SG Report, AMR ECOSOC 2013. [↑](#footnote-ref-20)
21. On the importance of the science-policy interface see the Outcome Document of the Regional Consultations on the Post-2015 Development Agenda, Dakar, Senegal (10-11 December 2012), UNECA, AUC, AfDB, UNDP and the recommendations of the UN SG High-Level Panel on Global Sustainability Report ‘Resilient People, Resilient Planet: A Future Worth Choosing’, 2012. [↑](#footnote-ref-21)
22. Report of the High-Level Panel of Eminent Persons on the Post-2015 Development Agenda. [↑](#footnote-ref-22)
23. UN SG Report, AMR ECOSOC 2013. [↑](#footnote-ref-23)
24. Ibid. [↑](#footnote-ref-24)
25. Outcome Document of the Regional Consultations on the Post-2015 Development Agenda, Dakar, Senegal – 10-11 December 2012, UNECA, AUC, AfDB, UNDP. [↑](#footnote-ref-25)