

UN SYSTEM TASK TEAM ON THE **POST-2015 UN DEVELOPMENT AGENDA**



**Science, technology and innovation
for sustainable development in the
global partnership for development
beyond 2015**

Thematic Think Piece

**ITU, OHCHR, UNCTAD, UNEP, UNESCO,
UNFCCC, UNIDO, WIPO, WMO**



Following on the outcome of the 2010 High-level Plenary Meeting of the General Assembly on the Millennium Development Goals, the United Nations Secretary-General established the UN System Task Team in September 2011 to support UN system-wide preparations for the post-2015 UN development agenda, in consultation with all stakeholders. The Task Team is led by the Department of Economic and Social Affairs and the United Nations Development Programme and brings together senior experts from over 60 UN entities and international organizations to provide system-wide support to the post-2015 consultation process, including analytical input, expertise and outreach.

Science, technology and innovation for sustainable development in the global partnership for development beyond 2015

A post-2015 agenda for development: Ensuring equitable and inclusive globalization

Debates on how best to promote sustainable and inclusive development are incomplete without a full consideration of issues of science, technology and innovation (STI). Access to new and appropriate technologies promote steady improvements in living conditions, which can be lifesaving for the most vulnerable populations, and drive productivity gains which ensure rising incomes.

There are two essential STI issues that need to be tackled simultaneously in the post-2015 development agenda. Firstly, innovation driven growth is no longer the prerogative of high income countries alone, some developing countries have achieved significant economic growth through the creation and deployment of STI capacity. But, this has not been the case for all countries, in particular LDCs. Secondly, STI policy has often been pursued independently of the broader developmental agenda; it is important that STI be integrated into public policy goals, giving particular focus to the nexus between STI, culture, education and development.

In addressing these issues, STI will need to be made more participatory and inclusive so that there is public engagement in the scientific endeavor from the full spectrum of social actors, including women, young people and indigenous communities. The least developed countries will require dedicated support to bolster their efforts to build STI capacity.

Technological learning and innovation capacity: a cross-cutting issue for inclusive development

The technological challenge and global public goods¹

In the MDGs, issues of science and technology have focused predominantly on access to essential medicines (particularly for the treatment of HIV/AIDS) and on internet connectivity and the related spread of communication technologies (ICTs). The favoured approach has been through needs assessment and targeted capacity building.

However, delivering on the full range of amenities which underpin the MDG agenda, including, inter alia, environmental protection, the containment of health epidemics, mitigating climate change, requires access to a range of appropriate technologies. Much of the required technology is already available in the public domain but accessing and linking them to the required knowledge and skills within countries is neither automatic nor costless. It calls for investments in dynamic capabilities, particularly those that shape the ability of national stakeholders to uptake and absorb technologies and make improvements in line with local circumstances. This is not a one-way process. Some level of technological capabilities in countries is critical to ensure the provision of these amenities to all. At the same time, the critical importance of such amenities spans beyond individual countries or regions. In such a case, the international community as such, has a collective responsibility to ensure the provision of these goods (Stiglitz, 2007, among others).²

Within the UN Framework Convention on Climate Change, the new Technology Mechanism established by the Cancun Agreements in December 2010 represents a move towards a

¹ Public goods are those goods that exhibit non-rivalrous consumption (the use by one individual does not diminish the availability of the resource to another) and non-excludability (when it is difficult to exclude people from consuming the good). The notion of global public goods is a recent concept that builds on established economic literature on public goods; public goods are referred to as global public goods when they have benefits that are universal in nature spanning across countries and people. While the boundaries of the term 'global public goods' is still being debated, the fundamental idea is that for those goods that can be called as such, the international community has a collective responsibility to ensure the provision of those goods (See for example, Stiglitz, 2007).

² Stiglitz, J.E., 'Knowledge as a Global Public Good' in International Intellectual Property in an Integrated World Economy, F. Abbot, T. Cottier, and F. Gurry, eds., Aspen Publishers, 2007.

more 'dynamic' arrangement by fostering public-private partnerships; promoting innovation; catalyzing the use of technology road maps or action plans; mobilizing national, regional and international technology centres and network; and facilitating joint R&D activities. Scaling-up and extending this kind of approach will be a central part of the post-2015 global partnership.

Innovation and Growth: Value Creation

In addition to its role in providing global public goods, science, technology and innovation (STI) serves as a crucial driver of rising prosperity and improved national competitiveness. However, because technological knowledge and skills are cumulative, first mover advantages have created a very uneven global landscape. Connecting local technological needs to international technological opportunities is a particular challenge for many developing countries.

A well functioning STI *ecosystem* needs to include, inter alia, political stability and well-functioning institutions, an educated workforce; sound research and education infrastructure and linkages between public and private innovation actors; enterprises committed to research and development; as well as a balanced intellectual property rights (IPRs) framework. Given that knowledge exhibits several properties of a public good, there is a persistent danger of underinvestment, and policymakers have increasingly sought to improve the incentives to create and transfer knowledge from publicly funded research to enterprises, thereby reinforcing the impact of that research on innovation capacity. But in addition to national strategies, regional and international frameworks including the UN and its agencies, funds and programmes must respond in new ways to ensure that innovation is integrated into national development priorities, particularly in least developed countries (LDCs), where the technological divide is greatest. These varied responses are required because STI *ecosystems* have become more complex and are now built on a mixture of collaboration and competition involving market incentives but also private and public partnerships across borders.

Intellectual property is an important way of rewarding the commercialization of innovation which underpins growth and development, as well as promoting the disclosure

and dissemination of technological information. It is as such a key element of the ecosystem. But it is not an end in itself. Commitment to the protection of intellectual property through cooperation among states should be coupled with a commitment to ensuring that all countries are able to benefit from the use of intellectual property rights for economic, social and cultural development. Finding the right balance between accessibility and reward (for creativity and innovation) remains a fundamental challenge in building inclusive and sustainable development paths. Given that appropriate intellectual property policies are context specific there is also a need to ensure that, for those countries that request it, appropriate technical assistance is available to make most effective use of the IP system, especially in order to be able to foster national developmental goals.

Technology and innovation for catch-up growth

Technological change, particularly in developing countries, is not only about innovating at the frontier, but also about adapting existing products and processes to achieve higher levels of productivity as applicable to their local contexts. In this process, the ability of local firms and enterprises to access technological know-how is fundamental to shaping their ability to provide products and services, both of the kind that are essential to improve living standards, and that could also promote growth and competitiveness.

This requires investment not only in higher value manufacturing industries but also into sectors that contribute to broader public policy goals (such as health, agriculture, nutrition and environment) as well as across a range of activities that support overall development, including also marketing, management and financial services. Such investments, over a period of time, help to increase absorptive capacity and the ability to adapt and apply existing technologies, thereby leading to a gradual increase in productivity and social welfare.

Knowledge accumulation in all countries depends on steady investments to increase science education as well as to improve the STI policy environment to foster endogenous innovations, through all means of learning, including research and development. Some lessons stand out in this regard. First, incorporating science education in the curricula from

primary and high school levels to the encouragement of research poles around existing universities is one key step. Second, partnerships with university research institutes and industry will be a key driver of improving the overall ecosystem making it attractive for human skills to return, including the return of skilled labour from developed to developing countries. Third, broadening the culture of science, technology and innovation is also important. Fourth, science and technology must be accessible to all levels of learning, including to the public through the media to show how research can drive high technology innovation and wealth creation. Finally, knowledge sharing both nationally and internationally is critical. This can be promoted through ICTs and broadband networks, particularly the application of technology-supported learning (eLearning), which can increase the effectiveness of education, including its outreach and awareness-raising.

Bridging the technological divide through access to technologies

The question of promoting equitable global economic development has always been seen in conjunction with promoting access to the knowledge base in those countries at the technological frontier. But bridging the technological divide has been an uphill, and for many countries a frustrating, endeavor. However, the experiences gathered over the past few decades, both within countries and at the international level, are valuable in charting a future course. Of these, some of the most essential ones are summarized here.

Learning opportunities for innovation arise regularly from a variety of sources, such as from investments in new machinery and equipment, technology suppliers, mobility of labour, interactions with other knowledge agents, trade and investment. External opportunities, such as contract manufacturing for export and supplying to global value chains, are additional sources of learning. However, because learning does not occur automatically or without costs, it requires appropriate incentives, policies and institutions.

Institutional frameworks that enable the creation of dynamic capabilities are best viewed in terms of what are now called national innovation systems, and often also, sectoral innovation systems. National innovation systems can be understood to mean the

underlying network of all actors, economic and non-economic, interactions among whom is critical to promote learning and knowledge accumulation.

Trade rules, intellectual property rights and investment are means to achieve overall development, including through technological change. There is a need to ensure that they are coherent with overall technological development objectives of countries. There is also a need for efforts to ensure that existing agreements maximize policy space and, where appropriate, expand it in sectoral areas of interest to developing countries to ensure inclusive, sustainable development.

A range of international collaborative ventures and alliances can help address the creation and dissemination of technologies in sectors of public importance, especially health and agriculture. STI partnerships can play a critical role. As the United Nations Task Force on Science, Technology and Innovation noted, innovation and technology are needed to transform countries from reliance on the exploitation of natural resources to technological innovation as the basis for development. However, some recent empirical research conducted by the World Bank has sought to explain the relative scarcity of STI partnerships. The research concludes that efforts to promote partnerships have been ad hoc and partnerships have been limited in their capacity to promote broad, systemic improvement. Such partnerships have also not always been sustainable in generating a legacy since partnership programs often operate in isolation from related donor activities taking place simultaneously in the countries. Finally, partnerships are not always linked to the priority needs of developing countries. These weaknesses of partnership programs need to be addressed if they are to deliver effective results and build capacity.

Bridging the technological divide by promoting inclusive innovation

Promoting inclusive innovation within countries

Governments will find it difficult to raise living standards in a sustained manner, feed their growing populations, keep their children healthy, and protect their environment, if they cannot find better, cheaper and smarter ways of producing goods and bringing them to

market.³ The future holds other challenges where new technologies will be key, particularly where climate change is involved. In both traditional and frontier markets, competition between innovators will be critical to ensure the development of socially useful products and processes at affordable prices. However, for many developing countries, persistent obstacles will need to be addressed through a global partnership for development.

The first of these is financing acquisition and innovation. In a large number of developing countries, shallow financial markets often thwart their responses to developmental needs. It remains imperative that the challenge of mobilizing such financial resources for technological development form a significant part of the post-2015 agenda.

A second obstacle is incentives. Where there is a strong market pull, commercial drivers encourage a diversity of approach. However, in addressing some of the key development challenges, market incentives may not be sufficiently strong to drive the necessary innovation. Where markets are not strong, additional approaches are needed to bridge the gap. We see this clearly in the lack of development of new treatments for neglected tropical diseases. But a similar situation may occur with any technology needed to address the needs of poor populations. In a world where the primary incentives for innovation are market-based, the inability-to-pay often translates into an inability-to-access. There is a need for a proactive policy agenda that focuses innovation on the needs of poor populations and makes the products of that innovation more readily available to those who need it.

A third obstacle is information. Data covering the three pillars of sustainable development needs to be collected, harmonized, managed and integrated in a more coherent way to support better policy-making and decision-making. The issue of access to information has been addressed in *The Future We Want*⁴ and the public-right-to-know is fundamental in engaging all relevant stakeholders in sustainable development. The technology exists for collecting economic, environmental and social data and making it accessible for all via the

³ Science, technology and innovation and intellectual property rights. Thematic Think Piece of the UN system task team on the post-2015 development agenda, May 2012.

⁴<http://www.uncsd2012.org/rio20/content/documents/370The%20Future%20We%20Want%2010Jan%20clean.pdf>

web but there is a challenge to change attitudes and cultures within those ministries and agencies responsible for data collection so that the sharing and exchange of information across the three pillars can result in synergies and bring increased benefits for a wide spectrum of users from policy-makers to the business community to citizens. Mobile learning and the use of mobile devices for communicating data and information for sustainable development has enormous potential. One challenge is to provide content in a format suitable for quick and easy comprehension by the user.

Partnerships are critical to overcoming these market failures. In the field of health a range of Product Development Partnerships (PDP), several involving the UN system and its agencies, have been formed to promote the development and distribution of treatments, therapies and vaccines for diseases which otherwise would have been “neglected”. While the PDP model has had some success in the health field, in other sectors, other models have been tested including by national governments in several countries such as India, China, Brazil and Chile, among others. Alternatively, institution led models such as the Global Research Alliance which addresses global development challenges through inclusive innovation generated within its global and culturally diverse network has also started to deliver results.

The World Bank has suggested that such initiatives could be complemented by an Inclusive Innovation Fund (IIF) to support innovators in developing their ideas to the point where they can raise private finance by proof of concept or through prototyping and marketing development. Such Funds are being operated in developing countries at national level, but could be extended regionally or internationally. Given the importance of absorptive capacity in the diffusion and uptake of new technologies in developing and least developed countries, the Climate Innovation Centres piloted by Infodev (www.infodev.org) may prove important in the diffusion of climate smart technologies. In considering the STI framework post-2015 the global partnership for development should consider developing such centres with a broader remit to complement the Inclusive Innovation Fund.

Conclusion

Lives saved and nourished will not be able to flourish in the absence of inclusive and sustained development that creates jobs, builds skills and reduces poverty. This is perhaps the most important lesson of the past decade.

Any effective global partnership supporting inclusive development therefore needs to frame development for all as the overall goal. This will need a rebalance of priorities and concerns globally to achieve a paradigm shift where the relevance of cross-cutting issues, such as technology and innovation, is not contestable.⁵ Such a new global deal will need fresh thinking, supported by effective policies and instruments in order to provide a roadmap for action. Whether a set of narrowly defined targets will help to accomplish this purpose will need to be debated.

The issues raised by this think piece will be essential in framing this debate, the most urgent of which are provided here in a snapshot.

The objective of achieving overall development and the MDGs as they stand currently have a virtuous relationship. A new global deal is needed that promotes the virtuous cycle of achieving each of these individual targets that are essential for the wellbeing of people in conjunction with creating an overall environment that promotes overall progress and prosperity. Such a new global deal will need fresh thinking, supported by effective policies and instruments in order to provide a roadmap for action.

Technological learning and innovation capacity that is critical to enable the provision of essential amenities to all is fundamental to ensuring overall sustainable development. Simply put, a country develops capabilities to innovate, and the absence of such capabilities results in limitations to apply existing technologies in all sectors, including those of public importance, such as health, agriculture and climate change. Building

⁵ This has been recognized as well by Article 15 of the International Covenant on Economic, Social and Cultural Rights which notes the right of all people “to enjoy the benefits of scientific progress and its applications.”

technology and innovation capacity within countries as a whole should therefore be considered as an important international priority in the post-2015 agenda.

Many of the countries that have tremendous constraints in mobilizing financial resources are those that urgently need to build STI capabilities. The international community will have to step in to fill this gap. These financial commitments are currently lacking even within sectors such as climate change or energy access, where financing innovation capacity needs to become a priority if sustainable development is to be achieved.

Aligning the interests of the private sector with the overall need to promote access to existing technologies and create products and services aimed at markets with little or no ability to pay is no easy task. Left on their own, these interests will most likely not converge. There is a need to rethink how best to diffuse existing technologies as well as promote access to new technologies for all. Whether embodied as products or processes or in the form of knowledge transfers, such exchange holds the key for a sustainable and prosperous future for all.

Each of the existing models to promote innovation have had their successes but also their share of difficulties. Efforts to promote a sustainable partnership in the post-2015 agenda should consider the merits and difficulties faced within the current models and see how they can be augmented by the international community to overcome the challenges in promoting STI for inclusive development.

UN System Task Team on the Post-2015 UN Development Agenda

Membership

Department of Economic and Social Affairs (DESA), Co-Chair

United Nations Development Programme (UNDP), Co-Chair

Convention on Biological Diversity (CBD)

Department of Public Information (DPI)

Economic Commission for Africa (ECA)

Economic Commission for Europe (ECE)

Economic Commission for Latin America and the Caribbean (ECLAC)

Economic and Social Commission for Asia and the Pacific (ESCAP)

Economic and Social Commission for Western Asia (ESCWA)

Executive Office of the Secretary-General (EOSG)

Food and Agricultural Organization of the United Nations (FAO)

Global Environment Facility (GEF)

International Atomic Energy Agency (IAEA)

International Civil Aviation Organization (ICAO)

International Fund for Agricultural Development (IFAD)

International Labour Organization (ILO)

International Maritime Organization (IMO)

International Monetary Fund (IMF)

International Organization for Migration (IOM)

International Telecommunication Union (ITU)

Joint United Nations Programme on HIV/AIDS (UNAIDS)

Non-Governmental Liaison Service (NGLS)

Office of the Deputy Secretary-General (ODSG)

Office of the High Commission for Human Rights (OHCHR)

Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (OHRLLS)

Office of the Special Advisor on Africa (OSAA)

Peace building Support Office (PBSO)

United Nations Children's Fund (UNICEF)

United Nations Conference on Trade and Development (UNCTAD)

United Nations Convention to Combat Desertification (UNCCD)
United Nations Educational, Scientific and Cultural Organization (UNESCO)
United Nations Entity for Gender Equality and Empowerment of Women (UN Women)
United Nations Environment Programme (UNEP)
United Nations Framework Convention on Climate Change (UNFCCC)
United Nations Fund for International Partnerships (UNFIP)
United Nations Global Compact Office
United Nations High Commissioner for Refugees (UNHCR)
United Nations Human Settlements Programme (UN-HABITAT)
United Nations Industrial Development Organization (UNIDO)
United Nations International Strategy for Disaster Reduction (UNISDR)
United Nations Institute for Training and Research (UNITAR)
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