



Regional Dialogue on Technology Facilitation for Sustainable Development

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Background Paper

1. Introduction

Development, transfer and dissemination of technologies are vital in enabling countries to attain sustainable development as well as in the achievement of Millennium Development Goals. The outcome document of Rio+20 (United Nations Conference on Sustainable Development) in 2012, entitled “*Future we want*”¹, echoes this point. The outcome document defines that poverty eradication, changing unsustainable and promoting sustainable patterns of consumption and production and protecting and managing the natural resource base of economic and social development are the overarching objectives of and essential requirements for sustainable development. In order to support sustainable development, the outcome document emphasizes the need to promote, facilitate and finance, as appropriate, access to and the development, transfer and diffusion of environmentally sound technologies and corresponding know-how, in particular to developing countries. In this connection, the document stresses the importance of cooperative action on technology innovation, research and development, and of exploring modalities in the relevant forums for enhanced access to such technologies by developing countries. The importance of technology transfer for developing countries was also highlighted in the Bangkok Declaration of the Asia-Pacific region on the United Nations Development Agenda beyond 2015². In particular, the least developed countries (LDCs) have repeatedly called on the development partners to facilitate technology transfer including with the development of clean and renewable energy technologies, water treatment, waste management, and sustainable agricultural production, as emphasized in the Istanbul Programme of Action for least developed countries³.

¹ Resolution adopted by the General Assembly on 27 July 2012 (A/RES/66/288), “Future we want”

² Outcome of Asia-Pacific Ministerial Dialogue: From the Millennium Development Goals to the United Nations Development Agenda beyond 2015, held in Bangkok, 26-28 August 2013.

³ Programme of Action for the Least Developed Countries for the Decade 2011-2020 (Istanbul Programme of Action), A/CONF.219/3/Rev.1, May 2011.

This background paper is intended to support the Regional Dialogue on Technology Facilitation for Sustainable Development, which aims to share experiences in technology facilitation at national and subregional level and to discuss opportunities for technology facilitation mechanisms at regional scale in connection with post-Rio+20 global efforts for technology facilitation. In this regard, the paper highlights various aspects of technology facilitation initiatives by the international organizations discussed in the Secretary-General (SG)'s report, and review some of the experiences in ESCAP as an example when mapping out initiatives in the region to support technology facilitation.

2. Post-Rio+20 processes on technology facilitation

Discussion at global level

The outcome document “*Future we want*” requested relevant United Nations agencies to identify options for a facilitation mechanism that promotes the development, transfer and dissemination of clean and environmentally sound technologies, and requested the Secretary-General to make recommendations regarding such a facilitation mechanism. In response, proposals by UN organizations and bodies, including ESCAP, were synthesized in the SG report to the General Assembly⁴. The report contains some on-going initiatives and proposals by UN organizations and bodies, as well as recommendations on possible initiatives to promote the development, transfer and dissemination of clean and environmentally sound technologies.

Despite a large number of capacity-building activities on technology, there is a perceived fragmentation of capacity-building and, in general, of all international technology facilitation efforts in this area. The SG report points out that it may reflect significant gaps, overlaps or insufficient coordination of those efforts, while it may also reflect diverse challenges and responses to address those challenges. Questions arise as to whether technology needs have been mapped systematically and whether the international programme and mechanisms to capacity-building correspond to the needs.

The SG report in 2013⁵ provides a set of recommendations for accelerating technology facilitation efforts. Some are to examine needs and gaps and strengthen information flow and coordination on the existing structures; some are more ambitious, suggesting initiating an UN-led mechanism for technology transfer at global level. Such global mechanism could facilitate, for instance,

⁴ “Options for a facilitation mechanism that promotes the development, transfer and dissemination of clean and environmentally sound technologies”; Report of the Secretary-General, issued on 4 September 2012 (A/67/348), and on 12 August 2013 (A/68/310)

⁵ A/68/310

- a technology development and transfer fund⁶ to assist with the transfer of privately owned technologies relevant in responding to urgent global sustainability challenges;
- global networks of national organizations relevant to different stages of the technology life cycle, such as science foundations, business incubators and intellectual property registration bodies;
- an international network of research/innovation policy makers that brings together representatives from technology leader countries, as well as developing countries, including LDCs, to discuss options for promoting technology cooperation that can address sustainable development challenges faced by developing countries, and, in particular, the poor and the vulnerable; and
- public-private-civil society partnerships designed to foster technology cooperation and the transfer of key technologies needed to advance progress towards specific sustainable development goals.

Special framework to support the Least Developed Countries

The LDCs continue to be severely disadvantaged in development and deployment of technologies, including clean and environmentally sound technologies, despite a growing role of developing countries in the process.

The Istanbul Programme of Action, adopted at the Fourth United Nations Conference on Least Developed Countries in 2011, envisaged the technology bank and science, technology and innovation supporting mechanism dedicated to the LDCs. The report of the Secretary-General on Technology bank and science, technology and innovation supporting mechanism dedicated to the least developed countries (A/68/217), in pursuant to GA resolution 67/220, proposed a technology bank comprising of (a) a patents bank to help the LDCs access and utilize appropriate technologies; (b) a science, technology and innovation supporting mechanism to help improve the scientific research and innovation base of the least developed countries; and (c) a science and technology research depository facility to promote global networking of researchers and research institutions in the least developed countries.

GA resolution 68/224 requests the Secretary-General to constitute a high-level panel of experts drawn from the LDCs and their development partners, the UN system and other relevant stakeholders, with support by the Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing

⁶ Theme study of 68th ESCAP Commission Session also explored creation of a region-wide cooperation framework such as Asia-Pacific Technology Development Council (APTECH) and Asia-Pacific Technology Fund. for detail, see *Growing Together: Economic Integration for an Inclusive and Sustainable Asia-Pacific Century* <http://www.unescap.org/commission/68/theme-study.html>

States (OHRLLS), in order to carry out a feasibility study to examine its scope, functions, institutional linkage with the UN and organizational aspects.

Special framework to support action of developing countries on climate change

United Nations Framework Convention on Climate Change (UNFCCC) urges developed countries to take all practicable steps to promote and facilitate the transfer of, or access to, environmentally sound technologies and know-how to developing countries. In this connection, UNFCCC has facilitated various intergovernmental dialogues and cooperation on technology transfer and since 1999 supported Technology Needs Assessments in more than 85 developing countries with financial support from Global Environment Facility. The Assessment helped not only identify technology needs in each developing country but also draw a global picture of prioritized technologies in both mitigation and adaptation sectors and types of barriers to technology transfer⁷. The role of UNFCCC in facilitating technology transfer has been further strengthened by the decision of the 16th Conference of Parties to UNFCCC in 2010, which agreed on launching Technology Executive Committee (TEC) together with the Climate Technology Centre and Network (CTCN) to promote accelerated, diversified and scaled-up transfer of technologies for climate change mitigation and adaptation, in developing countries, in line with their sustainable development priorities. In particular, the establishment of the operational arm of UNFCCC Technology Mechanism, the CTCN, implies moving from a rather ad hoc nature of mechanism and dialogue-led process, Expert Group on Technology Transfer, to a permanent and collaboration-led process by having a climate technology centre under UNEP and a network of 11 Centres of Excellence located in developing and developed countries including two centres in ESCAP region, i.e. Asian Institute of Technology (AIT), Thailand and the Energy and Resources Institute (TERI), India.

Discussion at ESCAP

ESCAP's background paper for the "Asia and the Pacific Regional Implementation Meeting on the Rio+20 Outcomes" held in April 2013 highlighted key challenges and approaches related to development, transfer and dissemination of technologies, which include (a) the need for the proper combination of national regulatory policies, fiscal incentives, and public financing to foster innovation activities; (b) the need to improve the ability of key actors of innovation systems to access, absorb and use technologies once they are acquired; and (c) the need for strengthening weak science, technology and innovation and their interfaces to ensure transfer of clean and environmentally sound technologies to developing countries, particularly the LDCs.

⁷ UNFCCC, Results and Success Factors of TNAs, 2013

During the Meeting, representatives of member States pointed out the strong need for capacity-building in relation to technology transfer, the important complementary role of South-South cooperation, the issue of intellectual property rights as an obstacle to the use of environmentally sound technologies, the need to address the issue of perverse incentives for polluters, the need for the establishment of partnerships with and learning from the private sector in relation to resource use efficiency. In this regard, the member States suggested that ESCAP facilitate and develop technical cooperation among members for transfer of environmentally sound technologies.

3. Changing context of technology transfer

The reports of the UN Secretary-General, which was presented to General Assembly in 2012⁸ and 2013⁹, highlighted the changing context of technology transfer as follows.

Increasing development of clean technologies with the dominance of a few countries:

Clean technology patenting has increased faster than other sectors. While it has increased by 20 per cent each year since adoption of Kyoto protocol in 1997, 80 per cent of clean energy technology patents are owned by entities in six countries (Japan, United States of America, Germany, Republic of Korea, United Kingdom of Great Britain and Northern Ireland and France), according to a survey conducted by the International Centre for Trade and Sustainable Development.

Increasing role of markets in technology development as well as technology transfer:

Technology flows are increasingly embedded in global trade and foreign direct investment (FDI) flows, thus forming part of international production systems, even though there are significant regional differences. To some extent, scientific infrastructure, human capital, favourable market conditions and investment climate can be more important factor than protection of intellectual property rights for out-licencing clean technology towards developing countries.

Increasing role of developing countries in technology development: While technology flows between developed countries are still dominant, rapid innovation of clean technologies in technology intensive developing countries increases the potential flows of clean technologies among developing countries through South-South cooperation.

Technology collaboration through advancing ICT: Advances in ICT development increased the potential for technology collaboration involving developing countries. Free and open-source collaborations through advancing ICT have increased new forms of science and technology collaboration possible, which is being recognized as alternative forms to the conventional intellectual property rights systems, to a certain extent. As a

⁸ A/67/348

⁹ A/68/310

result, the global research, development and demonstration network of clean technology cooperation has become almost universal. Today, entities in 182 Member States participate in some form of international clean technology cooperation, with potential knowledge flows among all of these.

4. Technology gap in Asia and the Pacific

The ratio of total research and development (R&D) expenditure against GDP is often used as a rough proxy for a country's innovation effort, although it should be noted that not all the efforts to generate new technologies are relevant to sustainable development¹⁰. The report of the SG (A/63/310) observes that, at global level, developed countries spend higher share of GDP on R&D than developing countries in general. There is a great variation particularly among middle-income economies, however, with some middle-income economies' share of R&D higher than high-income economies. It is also observed that the ratios are lower for many smaller economies. Among 50 countries in Asia and the Pacific for which data is available, more than half¹¹ of the countries record zero per cent share of R&D expenditure against GDP, of which almost all of them are countries with special needs (CSN)¹². None of LDCs except Nepal has record share of R&D expenditure against GDP. On the other hand, excluding four OECD countries, Singapore, China and the Russian Federation spend highest portion of GDP on R&D among countries in Asia-Pacific. Moreover, given the size of the economy, China's expenditure on R&D is second only to Japan in the region.

As for agricultural sector, an indicator commonly known as "intensity ratio" is used as one of the ways to evaluate a country's agricultural R&D commitment. It is a ratio of agricultural research spending relative to agricultural GDP (agGDP). In the region, in the 19 countries surveyed, public agricultural R&D spending remained less than 1% in 2008, and has not changed much since 1996. While four high-income countries spent on 4.13% of agGDP on agricultural R&D, the ratio is less than 1% in the rest of the countries (except Malaysia)¹³.

Recent efforts to measure innovation capabilities, such as Global Innovation Index, indicate similar patterns as R&D expenditure in GDP - while high income countries dominate top rankings, some middle or low income countries outperform higher-income economies. As stated in the report, the index is not meant to be the definitive ranking of countries with respect to innovation, and it places its emphasis on measuring the environment and infrastructure for innovation and on assessing related outcomes.

¹⁰ A/68/310

¹¹ Excluding non-regional members

¹² Based on data available at <http://databank.worldbank.org/data/home.aspx>

¹³ IFPRI (2013), Agricultural Science and Technology Indicators: Benchmarking Agricultural Research Indicators Across Asia-Pacific

Nonetheless, it is noteworthy that *innovation learners* - middle and low-income countries which are outperforming their peers with similar GDP per capita - include a number of developing countries of the Asia Pacific region, including landlocked developing countries, such as Armenia, Mongolia, and Tajikistan, in 2013¹⁴. Cambodia, one of LDCs in the region, is ranked 5th among the world's 21 low-income economies surveyed for the Global Innovation Index.

Similarly, while high-income countries dominate majority of patent filings at the IP office (64.5%), middle and low income countries take the majority of trademark filing (52.6%) and industrial design filing (64%)¹⁵. Patents filed by residents of China recorded the largest throughout the world in 2012.

5. Technology facilitation initiatives by the UN organizations

There are wide array of possible interventions related to technology facilitation for sustainable development, for various priority areas, different stages of technology lifecycle, and through various modalities such as capacity building, networking, etc.

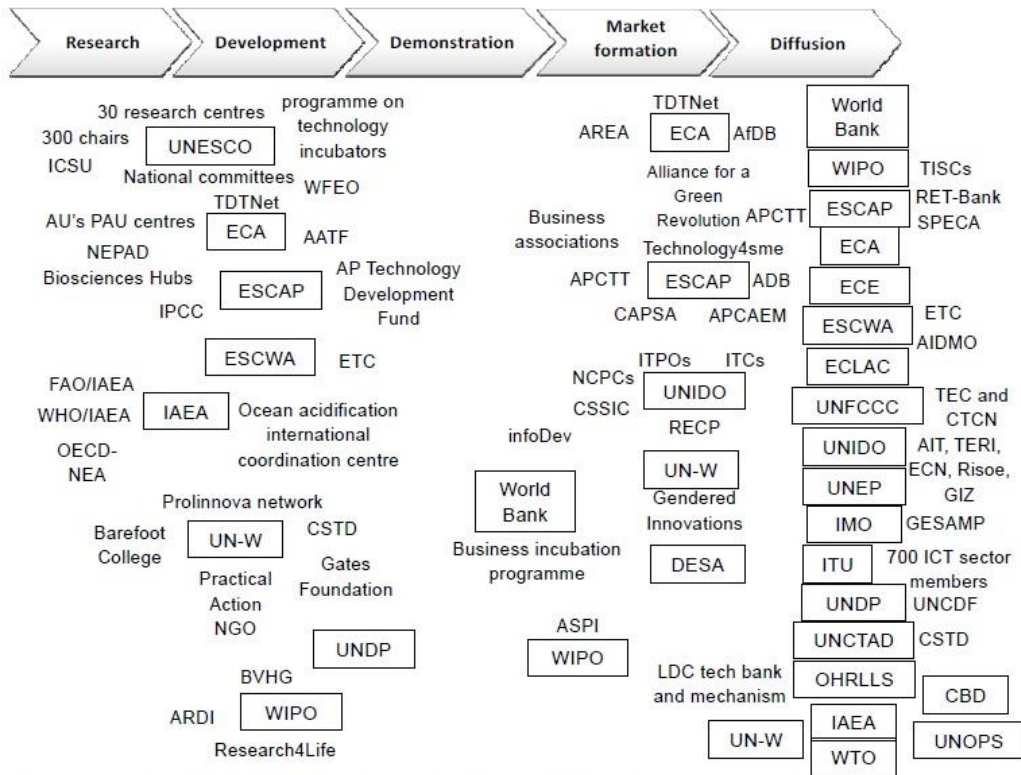
The Secretary-General's report¹⁶ provides survey of the initiatives proposed or initiated by the UN entities and intergovernmental organizations. The **Error! Reference source not found.** provides an overview of the proposals provided in the report.

¹⁴ Soumitra Dutta and Bruno Lanvin (2013), Global Innovation Index 2013; The local dynamics of innovation

¹⁵ WIPO (2103), World Intellectual Property Indicators

¹⁶ A/67/348

[Figure 1] Overview of UN contributions and partnerships



Abbreviations: AATF, African Agriculture Technology Foundation; ADB, Asian Development Bank; AfDB, African Development Bank; AIDMO, Arab Industrial Development and Mining Organization; AIT, Asian Institute of Technology; Alliance for a Green Revolution: Alliance for a Green Revolution in Africa; AP, Asia-Pacific; APCAEM, United Nations Asian and Pacific Centre for Agricultural Engineering and Machinery; APCTT, Asian and Pacific Centre for Transfer of Technology; ARDI, Access to Research for Development and Innovation programme; AREA, African Renewable Energy Alliance; ASPI, Access to Specialized Patent Information programme; AU's PAU centres, Pan African University centres of the African Union; BVHG, BIO Ventures for Global Health; CAPSA, Centre for Alleviation of Poverty through Sustainable Agriculture; CBD, Convention on Biological Diversity; CSSIC, Centres for South-South Industrial Cooperation; CSTD, Commission on Science and Technology for Development; CTCN, Climate Technology Centre and Network of the Framework Convention; DESA, Department of Economic and Social Affairs; ECA, Economic Commission for Africa; ECE, Economic Commission for Europe;

Note: APCAEM was renamed to CSAM
 Source: Report of the Secretary-General (A/67/348)

The report also lists institutional proposals for improved technology facilitation categorized by stages of technology cycle, key objectives and the modalities, as well as key

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