RIS Policy Brief

Financing Technology Delivery for SDGs: A Way Forward for TFM

Introduction

The importance of S&T and availability of innovation driven solutions, particularly to mitigate and address sustainability challenges globally has been a central theme in all important global platforms in the recent past including the Rio+20 process that led to the 2030 Agenda for Sustainable Development, the Third International Conference on Financing for Development (FfD3) leading to the Addis Ababa Action Agenda, the Climate Change negotiations under the United Nations Framework Convention on Climate Change (UNFCCC) including COP 21 and the Istanbul Plan of Action (IPoA) for the Least Developed Countries (LDCs). The FfD3 prioritising S&T delivery perhaps signals collective willingness to address issues of resource availability and financing of a global mechanism to facilitate and support the process.

The Addis Ababa Action Agenda documents final decision on part of world leaders to establish a Technology Facilitation Mechanism – TFM. This was officially adopted at the UN Sustainable Development Summit in September 2015 for the implementation of the 2030 Agenda for sustainable development. India (along with Brazil) has been enthusiastically promoting the cause for TFM under the Post 2015 Development Agenda. The Group of 77 and China long held an unambiguous position on the establishment of a TFM which it considers as one of the most transformative means to implement sustainable development. India

through its submissions has highlighted that immediate and urgent delivery of technology development, deployment, dissemination and transfer to developing countries require suitable responses, including a continued emphasis by all countries on the enhancement of enabling environments, facilitating access to technology, and financing that leverages private sector financial resources. Current institutional arrangements are insufficient to deliver immediate and urgent technology development, deployment, dissemination, and transfer to developing countries.

This policy brief reviews the current proposals for TFM and proposes a three-tier structure that can be way forward for the TFM. It also presents possible role that India can play in steering the TFM.

Institutional Architecture for TFM

The 2030 Agenda, *prima facie*, has only produced a rough skeleton of the proposed TFM. The structure proposed is the following:

- UN Inter-Agency Task Team (UN IATT);
- Multi-stakeholder Forum on Science, Technology and Innovation for Sustainable Development Goals (SDGs) (STI Forum); and
- Online Platform.

In line with the institutional mandate, the UN IATT has been formed and the first

STI Forum has already taken place. However, creation of a new mechanism over and above sector specific initiatives, that have been there for some time and were outcomes of needs felt at different times, has created confusion at the level of multilateral institutions as well as country governments. Moreover, the contours and mandates of each of the above and how they would work together towards a single institutional framework with the prime objective of making technologies available for development and sustainability needs, particularly in developing country contexts, is not very clear.

To ease doubts, there is a need to go back on the original negotiation process that led to this proposal and finally has been adopted in the 2030 Agenda. Despite ongoing initiatives, concerns were raised about their effectiveness and many in the developing countries have complained about their slow delivery and limitations time and again. The new mechanism has burden of its own ambition to steer through such already identified bottlenecks and be innovative in delivering key innovations to the developing world. Much lower resource and human capabilities put these countries at a disadvantage and hence opportunities of timely intervention for global sustainability may be lost. This would put at stake the vision of a common and shared future that has been agreed by all through this agenda.

Key hurdles may be identified as following:

- Poor financial capacities of governments and private firms in developing countries;
- Global regimes including IPR; and
- Systemic issues including capacity.

The UN mandated annual STI Forum, with widest possible participation of academics, thinkers, inventors, governments, firms, multilateral agencies and members of civil society organisations, is expected to deliberate on the above challenges. While the challenges are of perpetual significance, the objective of the STI Forum should be to present best practices and alternatives to guide the TFM. In future, this platform may be used to generate the necessary

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Box 1: TFM – Proposed Institutional Architecture

The proposal for the institutional architecture is taking shape primarily through inputs from various UN Agencies and other inter-governmental/multilateral institutions like UNDESA, UNEP, UNCTAD, UNIDO, ITU, WIPO, World Bank, and UNESCO. The proposed TFM will be based on a multi-stakeholder collaboration (STI Forum) between Member States, civil society, the private sector, the scientific community, agencies of the UN and other stakeholders. The composition would include a UN Inter-Agency Task Team (IATT) (comprising 29 UN entities) on science, technology and innovation for the sustainable development goals, a collaborative multi-stakeholder forum on science, technology and innovation for the SDGs and an online platform. The proposed online open platform is expected to provide a comprehensive index of existing technologies and tools that would enable implementing the SDGs and a coordinated STI capacity building programme. The global platform will map existing technology facilitation mechanisms, needs and gaps, including in areas vital for sustainable development, including environment, agriculture, cities and health.

Since its establishment, the IATT has adopted its Terms of Reference and decided to meet monthly. It is currently co-chaired by UNDESA and UNEP. Chairmanship of the IATT will rotate every two years among members. The IATT is working with 10 eminent representatives from civil society, the private sector and the scientific community to support the implementation of the TFM and the STI Forum. With regard to other tracks of work, the UN team has prepared an initial mapping of UN technology facilitation initiatives, which assessed more than 70 STI-related initiatives. The Task Team is also engaged in an ongoing reflection on system-wide capacity building efforts on science, technology and innovation. The IATT is also working to identify potential sources of funding, and to devise a strategy for mobilising resources to support the work of the Technology Facilitation Mechanism.

Source: UN.

feedback on the running and effectiveness of the TFM. In doing so, the STI Forum has to move beyond ongoing talk shop format and should undertake institutionalised practice of outcome documents for information and clarity on the views pursued therein.

In this backdrop, we propose a three-tier structure that may be a way forward for the TFM:

Tier 1: UN Inter-Agency Task Team (IATT) on TFM

The IATT is expected to be the main rule making body under the UN for TFM. In its 70 years of existence the UN has introduced several specialised agencies and has created specific funds and programmes to take care of diverse human needs in areas of development and sustainability. Each agency/fund/programme has its niche in terms of understanding the nature of particular global problems and has acted through well designed institutions and modalities that cover resources, manpower, policies and partnerships. Bridging knowledge gaps particularly in technical and scientific domains has been a core agenda of many such interventions. The formation of the IATT to administer TFM is logically sound in terms of achieving widest representation within the UN system in this regard (see Box 1). It should lead to two necessary outcomes:

- Leverage the existing architecture to deliver on TFM; and
- Design and manage future models of technology facilitation and transfer.

However, the two outcomes need not be treated as exclusive domains of expertise and each would feed in to the other.

i) Leveraging the existing architecture to deliver on TFM

Online Platform and Assessment of Technology Needs

The creation of the online platform should be seen as a reflection of the idea of leveraging the existing architecture. Specialised UN agencies can contribute through their experience, resources and repositories in building such a platform. IATT is best placed to coordinate this activity. This could serve to minimise duplication of ideas and efforts and should not only help potential seekers of technology but UN agencies themselves in understanding cross-agency strengths and how those can be leveraged to strengthen ongoing interventions.

However, virtual platforms without adequate means to assess sector-wise technology needs, identify commercialisation gaps and devise appropriate models of technology facilitation may not be effective. In the context of the SDGs, assessment of technology needs would entail goal specific requirements and categorising such technologies under ready-to-use, laboratory stage, prototype stage, stage of research, etc. For each category and nature of technologies the online platform should indicate the nature of partnership sought. While readily deployable technologies can be commercialised or leased through the technology bank operations (Tier 2), IATT should have specific guidelines on knowledge sharing so that interested partners can contribute to further development of those technologies based on the merit of their application and the idea of final use. Partnership projects can also be built around demonstration models. Without effective demonstration models, the usefulness of the technologies offered may not be obvious. We feel that activities which go beyond the creation and maintenance of the online platform should be ideally handled by the technology bank.

Apparently, online platform can best serve as an information source in case the real technology users are too distant from the source. One realises, technologies available in the domains of environmental mitigation, health, water and even communication may be under private ownership and can only be sourced through payment of adequate compensation. At the next level, many of the new and emerging technologies have dual use characters and hence deep trust building is required to evolve them towards developmental and sustainability objectives.

Capacity Building in the Context of TFM

While the UN over the years, through its various specialised agencies with sector specific niches, has been mapping capacity gaps in the developing countries, there is a new and emerging need to identify systemic deficiencies that might be relevant for TFM. These include capacities for technology assessment, particularly in the domains of development and sustainability in the first place in tune with the SDGs. Next would be in terms of ecosystems so that individual countries can come up with specific (cost effective!) technology solutions in these domains and contribute to the

global repository. And finally, to have relevant capacities to absorb and use technologies that are being transferred. No doubt, capacity building along these lines in many target countries would involve additional costs and hence the financing instruments supporting the TFM should have adequate provisions to predict and fulfil those needs. Effectively, capacity building would entail overcoming both institutional and resource constraints.

ii) Design and manage future models of technology facilitation and transfer

Designing the Technology Bank and Financing Models

As mentioned in the beginning, the TFM is expected to design policies beyond implementing the online platform. The policies should address the challenges identified above. The three tier structure prescribed here entails further layers of activities beyond the functioning of the IATT itself and maintaining the online-platform. The activities around a proposed technology bank and dissemination of technologies require careful policy design to mitigate informational asymmetries, market failures and other systemic challenges. The design of the technology bank itself would require procedural details on technology acquisition overcoming institutional bottlenecks like Intellectual Property Rights (IPRs) and menu of commercialisation channels. Finally, IATT also has to develop a template for financing both ends of the activities.

Means of Technology Facilitation

The technology bank would be of no use if it fails to provide technology solutions in places where they are most needed. This further suggests timely delivery and could mean customisation in response to user needs. The user in many cases we expect would be national governments or private parties (mostly mediated through national governments or relevant UN agencies). The IATT should visualise a complete scheme of activities that brings on board the regional UN agencies who could work together with the IATT, technology bank, other UN bodies at ground and national governments in facilitating transfer of relevant technologies.

Tier 2: The Technology Bank

Inspired by the already established Technology Bank for the least developed countries (LDCs), a key outcome of the IPoA (2011-2020), we propose that a universal technology bank be created as the core institution of the TFM. The operations of the bank would be undertaken according to mandate/policies formulated by the IATT. The bank would have its own governing board with members from IATT, the 10 member group and nominated financial and scientific experts. The board should also have representation from multilateral development banks. The bank may take up the following activities.

Creation of a Technology Fund

This fund may be used for acquisition of IP based technologies, creation of patent pools in relevant fields, and should have resources to fund prototype development, follow-up research on identified technologies and capacity building, as mentioned above. However, this fund may not be used as a source of direct funding of research that are presumably done by national governments or by specialised UN agencies.

This fund should be created through contributions from national governments (Official Development Assistance - ODA and other means), philanthropic foundations, multilateral agencies and banks, corporate sector (tapping on the corporate social responsibility linked resources) and individual contributions eligible for specific tax reliefs. The fund may be created along same lines as existing fund and programmes, but efforts must be made to develop most suitable template in terms instruments of resource generation and utilisation.

Technology Acquisition and Absorption

The core activity of the technology bank should involve devising mechanisms for technology acquisition from various sources both in the domains of IP based technologies as well as for technology solutions that have emerged out of human ingenuity and not protected by IP instruments. Such technologies would primarily cater to the needs of SDG implementation informed by technology assessments elaborated earlier. The fund created should provide adequate resources for this activity. While, IPRs and private ownership of knowledge have been seen as answers to market failures, innovative means based on new forms of use based rewards and financial models, that shift liabilities to the future (tax credits etc.), may be effectively used to source such technologies. Robust partnerships for global public good concerns may be initiated in all their forms (North-South, South-South

and Public-Private) to strengthen this process. It is not very clear if multinational corporations, who own large number of technologies, would enthusiastically participate in the process. Therefore, special efforts must be made to acquire innovations emerging out of public funded research across countries, depending on their utility. Finally, as in the case of LDC technology bank the TFM technology bank should adequately focus on strengthening technology absorption capabilities for the acquired technologies, particularly in countries that lack human or knowledge resources.

Technology Licensing and Commercialisation

As explained earlier, the sole objective of the TFM is providing technology solutions to countries that lack capacity to effectively implement the SDGs faced with technological constraints. Therefore, merit of technology request applications should be pre-judged based on such criteria. Requests have to be routed through concerned scientific departments of countries to ascertain that such technologies are not available in that country and that there is no available option to source such technologies. In such cases, technologies have to be commercialised through pre-negotiated and preferential licensing agreements, on non-exclusive terms. Apart from direct licensing, technologies can also be leased to interested parties. Small and medium enterprises in developing countries can be important end-users and they may seek specific technologies for environmental mitigation and competitiveness at affordable price. Such cases need to be evaluated on the basis of prospective improvements in sustainability parameters that the new technologies could achieve.

Commercial development (prototype development) and application of technologies are often risky and hence funding requirements may be crucial. However, to avoid diversion of funds such arrangements can only be worked out under strict oversight of the technology bank. The technology bank can be instrumental in forging the right collaborative partnerships for technology commercialisation.

While, priority needs to be given to resource constraint countries identified in terms of their reach to particular technologies, the user base need not be restricted. Relatively resource rich countries that approach the bank to seek technology solutions for addressing particular sustainability challenges may also be considered. After all, as captured in the SDGs, each challenge has cross domain repercussions and cross country spillovers from a global sustainability perspective. In such cases the resources available with the applicant need to be assessed and the right price needs to be fixed. However, proper caution has to be taken to ensure that technologies made available through preferential arrangements do not land in the hands of third parties who could exploit them for commercial purposes.

Tier 3: UN Regional Commissions for implementing Technology Facilitation

The technology commercialisation activities of the technology bank needs to be mediated through and vetted by UN Regional Commissions like Economic and Social Commission for Asia and the Pacific (ESCAP), Economic Commission for Latin America and the Caribbean (ECLAC), Economic Commission for Africa (ECA), etc. Adequate institutional framework needs to be put in place considering resource limitations and the urgency to provide appropriate technologies and ensure timely delivery. Nodal offices need to be created within regional commissions to manage such activities and solicit applications. Individual countries should also appoint nodal officers for technology facilitation under TFM and oversight.

We recognise that while specialised agencies of the UN have domain expertise, the large and overarching bodies like the UN Regional Commissions have been effectively dealing with regional resource constraints and have been instrumental in drawing up region specific future plans on sustainability and capacity development in close coordination with the national governments. They are also best placed to correctly report the technology needs, may be in coordination with sister UN agencies, affecting a particular developing country region. These commissions have regional and country offices and can generate valuable feedback on the operationalisation of the TFM.

India's Possible Role in Steering the TFM

India has been a leader in the negotiations that led to the launch of the TFM under the 2030 Agenda for Sustainable Development. India has time and again articulated that finance and technology would be the most critical pillars

for implementing this agenda across the SDGs. With this vision, India along with like minded countries like Brazil and France and with support from G77 and China enthusiastically pursued the idea of a Technology Facilitation Mechanism in the negotiations on Post-2015 Development Agenda and the Rio+20 process. India's views have centred on concerns that the developing countries are at serious disadvantage when it comes to the availability of environmentally sustainable technologies and the current institutional mechanisms are inadequate to meet the full scale requirements or ensure timely delivery. Such concerns have serious implications for achieving the SDGs globally and developing countries would need meaningful support to implement the targets. The proposal of TFM rests on the fifth P of the agenda, i.e. Partnership, suggesting effective synergy between North-South, South-South and Public-private collaborations. In this endeavour, the focus should not only be on building the synergies, but also to strengthen these processes significantly.

However, we understand the TFM is essentially an inter-agency driven process within the UN, based on a multi-stakeholder model. Individual countries would have little role in directly influencing the concept and the operationalisation of the agenda unlike in any intergovernmental process. UN has several windows of engagements like the STI Forum and the civil society hearings. However, our experience suggests that diplomatic channels works the best in carrying the messages to committee Chairs or testifying at specialised UN meetings to which country diplomats have access to. This approach led to significant success that India has achieved in terms of institutionalising the TFM in the first place. India's able negotiators from the Permanent Mission in New York and senior bureaucrats from some of the key ministries in New Delhi who worked together as a group made this feat possible. India needs to continue with similar approach. However, at this juncture the government may constitute an independent expert group on TFM to guide this process. The progress made in operationalising the TFM by the UN can be communicated to the expert group on a regular basis by key negotiators in New York or Geneva. Members of the expert group can also be nominated for some of the meetings/negotiations.

The key objectives of diplomatic and other efforts by India would be to provide refined intellectual leadership and see that the initiative survives confusion and conflicts within the UN system. Given that India has so far argued for such a mechanism, it remains an unfinished agenda till the time all organs of the proposed mechanism start functioning properly. It would also be important for India to work with like minded countries in this matter and convince the larger membership about the expected benefits of this mechanism. India should also make efforts to gain confidence of countries from the South in this regard and communicate to them the elements of value addition that the TFM is supposed to bring. India should make sincere efforts to transform the TFM as the principal technology transfer mechanism within the UN system and ensure that it achieves its full scale (and not mere critical mass or threshold operations!)

As of now, apart from administrative hurdles within the UN system the credibility of the new facility would depend to a large extent on how it can respond to the grand challenges indicated in the beginning. Moreover, we have identified additional challenges at each tier for the proposed structure with issues ranging from technology assessment, appropriateness, and transfer. Adequate financing would continue to remain a key concern. While TFM would design new templates for financing its activities, governments would have to pledge significant resources. India should make substantive commitments in this regard to muster necessary clout for steering the process. India should also impress upon its big businesses to make financial contributions to this process through their corporate social responsibility commitments. India can also play host to key meetings to carry forward the mandate.

Apart from providing intellectual leadership India can unilaterally initiate projects and activities to demonstrate how technology acquisition, development and transfer can be effective means to address sustainability challenges in many fields (Box 2). India has also developed strong assessment frameworks that can be used to assess goal specific technology needs for India and South Asia. The knowledge and template of such assessment methods can be shared with other developing countries and UN agencies to help them achieve similar assessment

in their countries. This would strengthen India's position and opinion on the operationalisation of the TFM. India a prominent player in the development cooperation arena can effectively utilise such avenues under the South-South Cooperation framework to work together with partner countries in the South in their national technology assessments.

India can collaborate with partner countries in the South to strengthen the narrative on knowledge creation to face myriad sustainability challenges, overcoming limitations imposed by the global IP regime. India has been innovating and has pursued S&T in a concerted manner through focussed policies and institutions. Yet

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Box 2: India's S&T leadership on the Sustainability Triad: Health-Water-Energy*

India's robust innovation network has evolved over the years primarily under public patronage. In the last two decades India has not only encouraged FDI and private sector R&D but has also experimented with several models of public-private partnership for joint R&D projects. India has also seen spontaneous supply of cost effective innovations suited to local needs driven by individual innovators often outside formal innovation support systems. India has been mindful of the developmental gaps facing its citizenry and the growing sustainability challenges of resource intensive economic growth. India's approach to addressing sustainability has been rooted in aspirations towards leveraging new knowledge and innovations, not only to match local needs but also to overcome resource constraints in many cases. This has traditionally been pursued under the broad policy paradigm of 'self-reliance'.

In order to illustrate, we pick three areas that perhaps most strongly anchor and link developmental and sustainability needs in India and at the same time testify India's success at indigenous efforts for technological solutions. The three sectors are Healthcare; Water and Water Resource Management; and Clean and Alternate Energy. India has also demonstrated strong leadership abilities in forging international cooperation to address concerns in these areas. We highlight a few examples here:

Healthcare – Vaccine Development: India's success at domestic production of low cost drugs and pharmaceuticals is unparallel in the developing world and has earned it the eulogy 'pharmacy of the world'. Vaccines are among the greatest scientific achievements in modern medicine that has helped in saving humanity from the scourge of microbial infections. However, the available vaccines are far lesser in number than the target diseases, and the efficacy of those available is being continuously worked upon. India has emerged as a hub of vaccine research both in the public and the private sector and has been successful in commercializing a host of candidate molecules (hepatitis B, typhoid, anti-rabies, DTP-HB, DTP-HB-Hib, mOPV type 1, leprosy, hepatitis A, etc.).

Water: Water demand in India is estimated to increase from 710 BCM (billion cubic metres) in 2010 to almost 1180 BCM in 2050 with household and industry water consumption expected to increase almost 2.5 times. Hence, India has identified technology as the foremost tool to augment supply of clean water (through desalination, rain water harvesting and recycling) and effective management of water resources. India has achieved major success at desalination projects and is bestowed with a long coastline. India has also developed a host of low cost water purification technologies (by public funded research organizations) and has improvised widespread diffusion of such technologies in the form of clean water kiosks. Traditional and community level knowledge of water resource management is being systematically leveraged.

Alternate Energy – International Solar Alliance: India is working towards increasing renewable energy capacity by more than 5 times from 32 GW in 2014 to 174 GW by 2022. India's focus and efforts at solar energy generation is well acknowledged. Under the solar mission India targets deploying 20,000 MW of grid connected solar power by 2022 and aims at reducing the cost of solar power generation in the country through aggressive R&D and domestic production of critical components. India now hosts the International Solar Alliance of 121 prospective countries along the Tropics of Cancer and Capricorn that received plentiful of sunlight. This platform is meant to address the special needs of these countries and generate larger quantum of investment and resources. India was joined by France in launching this alliance during COP 21 in 2015.

Source: Compiled by authors based on information in the public domain and with inputs from Prof. T. C. James, Visiting Fellow, RIS.

*The participants of the RIS consultation meeting on TFM held on 30 August 2016 felt that building on India's STI leadership capabilities and proven expertise in key sectors, India may succeed in guiding the TFM process.

India needs crucial technologies to meet its own sustainability challenges. Recent technology assessments undertaken by India should provide valuable insights in this regard. In order to assess and grade India's technology needs, the inter-departmental approach has to be adopted. The States should be made equal stakeholders in order to encourage them to express their technology requirements for the SDGs.

India has made serious efforts to build an effective national innovation system to bridge the alleged public-private divide. This is particularly helpful in terms of scaling up prospective technologies and commercialising them. Various collaborative models tried out in this regard have key lessons to offer. India has also contributed meaningfully to international scientific projects and has shared scientific expertise with partner countries in the South. There is documented evidence to show that technical cooperation between India and some of the developing countries has led to economic and other benefits. Under the proposed TFM, India can contribute in scaling up nascent inventions as available from the online platform and the technology bank and transform them into cost effective innovations. Such innovations may be used in India and as well be shared with many other countries through the TFM. India can also make use of the TFM to promote its frugal innovations at the global level. India could also excel in various scientific and consultancy services that may be required by stakeholders as the TFM matures.

Way Forward

There have been concerns about the scale that the proposed TFM can attain, given the perceived overlap between the mandates of the TFM and several other specialised agencies. While there is sufficient scope that each of the UN agencies as well as stakeholders from outside the UN System can contribute to the process, the superstructure proposed may be above administrative conflicts of interests. The 3 tier structure proposed in this brief can be used as a template for a streamlined bureaucratic arrangement within the UN so that efforts undertaken at various levels become complementary. Synergy and complementarities would be critical for utilising available resources for a common objective. While we have proposed a new institution in the form of universal technology bank and have outlined specific modalities spanning provision of resources, mapping of technologies, acquisition and utilisation technologies and capacity development for emerging sustainability needs, it is clear that additional resources can only be materialised through country level ownership. Moreover, the connect with grand policy design at the level of ECOSOC and effectively utilising regional commissions would suggest the way forward for TFM.

As envisioned in the 2030 Agenda, the TFM should effectively contribute to the implementation of the agenda. To get the mechanism to deliver expected results, it has to be robust and larger in scale and scope than ongoing initiatives under the UN. The experience gained through ongoing initiatives should be key building block of this new institutional framework. However, the framework so developed should remain unique in its scope and modalities. The scale should solely be determined by the volume of global needs and the multitude of feasible solutions. The resource needs and the sophistication requirements for this new institution, therefore, would only be larger. To ensure that it achieves its full scale, effective partnership and collaboration has to be constituted within the UN System and deeper confidence building with national governments has to be pursued. The credibility and sustainability of this mechanism would depend on the extent it achieves its objectives.