# IATT Issues Brief on
# Science, Technology and Innovation for the SDGs Roadmaps

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## 1. Background

The 2030 Agenda, adopted at the United Nations Sustainable Development Summit in September 2015, positioned Science, Technology and Innovation (STI) as key means of implementation of the SDGs, and launched the UN Technology Facilitation Mechanism (TFM). The Annual Multi-stakeholder Forum for Science, Technology and Innovation (STI Forum), supported by the Inter-Agency Task Team on Science, Technology and Innovation for the SDGs (IATT), has been the main fora for TFM to discuss topics of common interests of Member States and STI stakeholders in the context of the 2030 Agenda.

STI roadmaps and action plans to help realise the SDGs have been among the central topics through the first three STI Forums. In the Addis Ababa Action Agenda, Member States had committed to "adopt science, technology and innovation strategies as integral elements of our national sustainable development strategies" (para 119). In the 2017 STI Forum, participants highlighted that the STI roadmaps and action plans are needed at the subnational, national and global levels, and should include measures for tracking progress. These roadmaps incorporate processes that require feedback loops, evaluate what is working and not working, and produce continual revisions that create a real learning environment.

With a view to translate these objectives into concrete outcomes, the IATT established a sub-working group for taking forward the discussions and initiatives on STI Roadmaps. The objective of the sub-working group is to devise and implement, with the help IATT partners and other stakeholders, an inter-sessional work program that will enrich STI Forum discussions on STI Roadmaps, through delivering tangible impact to be achieved over 2018-2019.

While several countries have, in the past, developed STI roadmaps with the support of various UN-system agencies, these have not been directed specifically towards the SDGs. Initially, the primary focus will be to exchange views on a common guidance, principles and possible frameworks/ methodologies for country and international level STI roadmaps for the SDGs. To these ends, the team supports a collective effort by a group of champion countries and through a multi-stakeholder collaborative approach among the IATT and other UN, non-UN partners and stakeholders. This work will inform the preparation of *Guidebook on Development of Science, Technology and Innovation Roadmaps for the SDGs*. The *Guidebook* will be a living document, to be updated periodically on the basis of evolving knowledge and experience with its use.

The rationale to facilitate a multi-stakeholder collaborative approach is clear. At present, the efforts potentially supporting STI roadmaps are fragmented at international, regional, national and sub-national levels, and do not necessarily have the SDGs as a focus. There is a lack of a coherent framework that guides policymakers and development practitioners to better achieve the SDGs through STI.

At the same time, there is important knowledge and experience scattered across the thirty six IATT members and other stakeholders. Therefore, this initiative is expected to add value through facilitating a common approach and developing a coherent framework to examine gaps, synergies and trade-offs, prioritize actions, strengthen national STI systems, and promote cross-sectoral collaborations and Goal-specific "deep dives" for the SDGs.

To this end, a seed fund is now available through the Government of Japan and the World Bank and will serve a starting point for initiating the work, demonstrating preliminary results and reaching out to potential donors for further cooperation. In the futures, a trust fund may be established to fully support the work of STI for the SDGs roadmaps, bringing stakeholders together, enhancing experience exchange, and facilitating further discussions and cooperation.

## 2. Framework for Discussions

The previous STI Forums discussed and reached consensus on criteria for effective STI roadmaps, which can be grouped into broad 10 elements under three categories: i) analytical and deliberative inputs; ii) policy outputs; and iii) process and implementation. These are also broadly in line with the rich literature on STI policy mix and roadmap development, as summarized in IATT's Background Paper[1].

- Analytical and deliberative inputs:

    1. Diagnostics, assessments and policy reviews of STI needs and gaps
    2. Foresight and horizon scanning, prospective analysis, participatory technology assessment
    3. Deep dives for each Goal, for roadmaps to help prioritize and promote cross-sectoral collaborations; integrated assessment tools to find desirable pathways that resolve trade-offs and maximize synergies

- Policy outputs:

    4. Coherent science, technology and innovation policy mix, addressing enabling conditions (e.g. robust legal environments, trade and investment policy, intellectual property protection), through a whole-of-economy, integrated, multidisciplinary approach
    5. Addressing potential socioeconomic effects of accelerating technological change and harnessing frontier technologies to leave no one behind
    6. Linking STI to national development challenges and development strategies; addressing SDGs universality principle while respecting national STI priorities and realities; coherence between STI policies in general and those focused on supporting the 2030 Agenda

- Process and Implementation:

    7. Capacity: human and institutional capacity building for STI policymaking
    8. Governance and coordination: open, inclusive, multi-stakeholder engagement such as across government entities and with private sector, academies of science, indigenous communities
    9. Learning: tracking progress, evaluating what's working, feedback and learning loops

    10. Resource: adequate funding for implementation and investment

These 10 points can be summarized as a "three-tiered" approach to STI Roadmaps, each corresponding to first, second and third in above analytical and deliberative inputs and policy outputs:

- **Foundation** of STI policy framework and enabling conditions;
- **Adaptation** to emerging technology and societal preparedness; and
- **Integration** of STI to national sustainable development plan.

These 10 points and the three-tiered approach represent an ambitious agenda that emerged from the previous STI Forums' discussions. Few Member States are likely to have developed STI Roadmaps that satisfy all of them. For example, advanced economies have mature foundations, with varying degree of adaptation/preparedness and nascent integration fully embracing the SDGs. None of the IATT Member Agencies are in a position to support all 10 points. For example, several agencies are experienced with strengthening foundations based on STI policy reviews; some agencies have experience with sector-/Goal-based STI deep-dives; yet few have established technology foresights capabilities to analyse and advise on disruptive implications at country level. Critically, many of developing countries lack necessary STI policy capacities for foundations. Developed countries often face challenges in coordination for integration.

Methodologies that help countries develop and implement national development strategies for the SDGs are yet to include a systematic way to identify and mainstream STI contributions. This includes also the supporting frameworks developed by international organizations, such as the UNDAF (United Nations Development Assistance Framework) and World Bank's SCD/CPF (Systematic Country Diagnostics and Country Partnership Framework).

At the same time, international facilitation and cooperation, including through mutual policy learning, have been emphasized as common themes to implement country level STI roadmaps both at developed and developing countries.

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[1] Science, Technology and Innovation for SDGs Roadmaps, IATT-STI (2018)

## 3. Overview of Categories of Relevant Analytical and Deliberative Inputs

Previously, IATT conducted a "mapping" of UN Agencies' efforts related to STI policy framework, action plans and roadmaps [2] . An updated horizon-scanning identifies dozens of relevant initiatives/programs/product lines across more than 10 UN Agencies, and other international agencies actively engaged in this space, such as OECD and EU. The STI policy support capabilities within and outside UN System broadly consist of the following, 7 categories:

**"Foundation"**

- STI policy and capacity diagnostics, assessments and reviews
- Functional STI-related diagnostics, e.g. entrepreneurship, ICT, intellectual property
- STI global indicators, statistics, analytical frameworks, benchmarking and trend analysis

**"Adaptation"**

- Foresight and scenario planning exercises
- STI-related norms and policy/regulatory standards

**"Integration"**

- Goal-/sector-/technology-specific "deep dive" STI assessment: energy, food, cities, water, education and health
- Systemic review of countries gaps, challenges, opportunities toward SDGs

The overall distribution of efforts across the UN System is concentrated in the "Foundation" largely addressing developing countries' capacity challenges, while UN agencies are increasingly moving toward assisting countries on "Integration" under the SDGs contexts. Countries have different levels of exposure to the UN System's offerings, from those receiving support from almost all agencies over the years, such as Rwanda, to those which have developed compelling national strategic STI roadmaps rather as a result of domestic efforts, such as Mauritius highlighted at the first STI Forum.

Developed countries, meanwhile, have both individually as well as collectively (including through non-governmental forums such as World Economic Forum) have developed approaches to "Adaptation," where UN Agencies are increasingly participating or commissioning for developing countries to benefit from. Methodologies for "Integration" are at a nascent stage over the last few years upon adoption of Agenda 2030, largely led by non-UN entities (except for "deep dive" in areas under agencies' core mandates).

## 4. International Facilitation and Cooperation

Against the richness of "supply-side" of international support to country level STI Roadmaps along the three aspects (foundation, adaptation and integration) as summarized, "demand-side" discussions at the previous Expert Group Meetings (EGMs) [3] complemented by analyses of countries' and agencies' examples highlighted several takeaways and questions for further discussions.

*Roles of international and supranational policy guidance and assistance*. Regional and other cooperation bodies are influencing country-level strategies and roadmaps, by incentivizing governments to adhere to policy standards, providing technical assistance for capacity building, funding investments, and facilitating spillover and peer learning. Based on country reviews, it should be noted that catalytic influence and technical, financial capacities of the coordination bodies vary (e.g. across EU, OECD, ASEAN, CARICOM, AU). What next steps can members of these organizations take to learn from each other and strengthen the necessary capabilities to harness STI for the SDGs, generating regional or collective goods and addressing collective challenges?

*STI strategies by donor countries/agencies*. Developed countries and donor organizations (e.g. EC JRC, Japan, UK, Australia) and emerging donors (e.g. China, Korea, Brazil, Thailand) have capably demonstrated that STI can support the acceleration of achievement of the SDGs across national borders, assisting developing countries through STI cooperation based on respective countries' development experiences and comparative advantages. Meanwhile, in many donor countries, innovative and synergetic practices are emerging through public spending for STI and ODA intersection. In a fiscally

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[2] Landscape of Science, Technology and Innovation initiatives for the SDGs, IATT-STI (2017), Box 3

[3] Meeting Report and presentations accessible at the EGM website.

constrained and interconnected world, what international STI cooperation strategies by and among developed countries can best harness STI as a 'bridging force' to serve both national and global interests?

*UN agencies' 'business models' in support of STI roadmaps*. Many developing countries have benefitted from UN agencies' support and expertise, notably UNCTAD, UNESCO, WB and Regional Commissions, to diagnose and strengthen foundations of STI systems and capabilities. Countries also have utilized function-/sector-/goal-specific STI assistance from agencies such as WIPO, UNIDO, UNEP, ITU, among others. Yet, the number of countries these agencies can assist per year, under current financial, administrative and operational models and instruments falls short of closing the gaps among countries and could be inadequate to deliver on the commitment of "leaving no one behind" by 2030. How best can UN agencies join forces to synergize, and harmonize where appropriate, methodologies and approaches to fit countries' demands and fill the gaps, at scale, while acknowledging and accommodating diversity of realities and circumstances countries face?

Upon progress of deliberations on country level roadmaps, the IATT sub-working group on STI roadmaps will continually explore over some of these questions with a view to also promote international and global STI roadmaps, as part of TFM's work program toward the future STI Forum.

## 5. A Way Forward

The EGM discussions reconfirmed that "STI for SDGs Roadmaps" are a powerful multi-stakeholder engagement tool to envision, plan, communicate and facilitate actions, track progress, and foster a learning environment to harness STI to achieve the SDGs. STI for SDGs Roadmaps as integral elements of national sustainable development strategies can be one of the TFM's major outputs over the next two years by elevating the STI agenda to the highest political level of respective countries' decision makers.

In response to strong interest expressed by countries participating in the deliberations so far, IATT is committed to implement an inter-sessional work program in 2018/19 to pilot and scale adoption of country level roadmaps, develop common principles of STI for SDGs Roadmaps based on lessons learnt, and

strengthen international cooperation accordingly. Upon further consultations and analysis, the **inter-sessional work program** can include the following components:

- **Peer learning**: nurturing a community of policy practitioners on STI for SDGs Roadmaps, to share common challenges and identify good practices, engaging developed and developing countries and refining conceptual frameworks presented above for further discussions.
- **Joint support for pilots**: identifying pilot countries for joint assessment, building on existing work programs of IATT agencies and other organizations, with a view to better synergize, harmonize and scale-up existing approaches, methodologies and instruments related to development and implementation of STI Roadmaps through economy-wide and sector/Goal-specific policy reviews, technology needs assessments, foresight exercises, and other technical and financial assistance.
- **Donor coordination**: promote dialogues among donor countries and agencies to take stock of existing international assistance programs on STI, with a view to strengthen complementarities, increase multi-stakeholder participation (possibly including research funders, philanthropies and private investors) and better address recipients' needs and gaps.
- **Knowledge and advocacy**: commissioning a group of experts to mainstream STI for SDGs roadmaps at the broader development policy discourse, gather and synthesize evidence base and country case studies, define future research agendas, and propose concrete actions by TFM to inform possible development of global STI roadmaps to facilitate subnational, national and international efforts toward achievement of the SDGs by all Member States.

In terms of **specific steps forward**, the sub-working group on STI for SDGs roadmaps have plans as follows:

- To start the work on national and international STI roadmaps, a fund from Japan and the World Bank will be used as a core seed fund. An Advisory Group will be established to guide the key activities on planning EGMs, developing guidebook and organizing other activities. The World Bank and UN DESA will be in the Advisory Group among others, responsible for overall coordination and facilitation. The IATT sub-working group members will be the implementing organizations.

- "**Guidebook on Development of Science, Technology and Innovation Roadmaps**" will be the overarching document of this initiative. In preparation of the guidebook, a ToR will be prepared. One of the chapters of the guidebook will be focusing on comparisons of main methodologies by UN agencies. The 10-Member Group for TFM be informed and invited to contribute to the work of the guidebook.

- **Engagement activities**

  IATT will engage championing/pilot countries as well as contributing institutions and experts (including on international roadmaps) through two additional global **Expert Group Meetings (EGMs)** in Europe and Africa, building on the 1st and 2nd EGMs prior to the third STI Forum (NY/Tokyo)

  In addition, IATT in partnership with regional commissions will organize **regional tracks**, triggered by (but not limited to): i) Asia, with ESCAP and possibly ASEAN and AsDB and ii) Africa, with ECA and possibly with TICAD organizers and AfDB.
  **Supplementary meetings** with focused discussion on elements of national roadmaps or international roadmaps, in partnership with OECD, European Commission, INGSA, among others, will be arranged.

This issues brief provides an overview of the current efforts toward STI for SDGs roadmaps as a common understanding for incoming participants to the collective efforts. The IATT will stand ready to engage in further deliberations with Member States and stakeholders to advance the contribution of STI to achievement of the SDGs.

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