OPERATIONAL NOTE

for implementing

SCIENCE, TECHNOLOGY, AND INNOVATION (STI)

for

SDGs ROADMAPs

Implementing Science, Technology and Innovation (STI) for SDGs Roadmaps

Operational Note

February 2020

Implementing Science, Technology, and Innovation (STI) for SDG Roadmaps at the Country Level: Operational Note

Contents

1. What is the STI for SDG Roadmaps?

The world is committed to the SDGs in 2015 with the ambition of reaching them by 2030. However, large global gaps are unlikely to be addressed by a business-as-usual approach in the remaining 11 years. There is tremendous potential as well as urgency to leverage STI to achieve the SDGs. The capacities, focus, and financial resources to exploit this potential are not there yet.

This operational note aims to help countries and governments at all levels effectively utilize the Guidebook of STI for SDG Roadmaps more systematically to help achieve the SDGs, as well as to help mobilize the global community to assist in that endeavor.

2. Why focus on STI for SDG Roadmaps?

Human progress has been based on advances of science, technology and innovation. This was clearly seen with the dramatic increases in growth and productivity from various technological revolutions. There has been a great divergence in uptake between countries that led these revolutions and the rest of the developing world. As a result, these revolutions have created additional pressures on the environment and manufactured new social costs such as disruption of traditional life and increased inequality within countries.

We now realize the need to also consider social and environmental factors when developing strategies that reflect the SDGs goals. We are also entering a new period characterized by rapid development and convergence of emerging technologies in the physical, digital, and biological spheres. These emerging technologies and their convergence offer tremendous opportunities and risks.

Historically, some countries (such as Japan and the Republic of Korea) have been very successful at technological catch-up and have become leaders through explicit strategies such as development of their science base, human and institutional capital, and effective government policies working closely with the private sector. Countries need to put in place effective strategies to use STI to further their economic and social development to reach the SDG goals. They need to take advantage of technologies that already exist as well as to make effective use of new emerging technologies and to mitigate the risks they present. That is why developing effective STI for SDG roadmaps is so critical.

3. Who are the Key Actors in the Intersection of Development, STI, and SDG Plans?

STI for SDG roadmaps are at the intersection of national development plans, STI plans, and SDG plans. Effective STI for SDG roadmaps need to be integrated into these plans. See Figure 1 for the main agents and interactions.

STI for SDG roadmaps may be developed at the national level by a central agency or ministry in charge of national development plans; by the Ministry of Science and Technology or other agencies in charge of STI plans; or by line ministries, or a specialized agency or taskforce with the specific mandate to develop SDG plans.

Figure 1: Integration of National, STI and SDG Plans and Key Actors

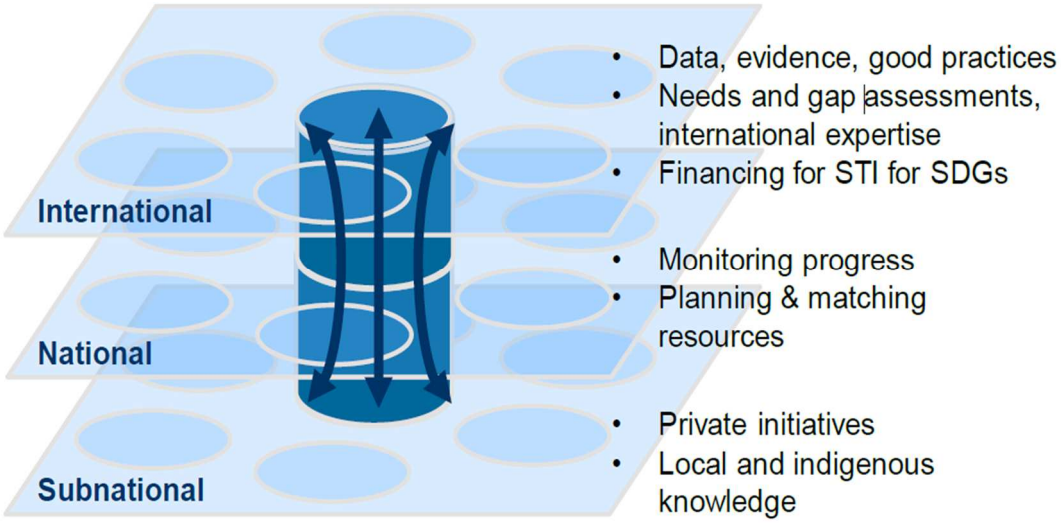
Ideally, the process would be coordinated at the highest level by the President's Office or the Ministries of Planning or Finance or some other specialized high-level agency tasked with this responsibility. However, the initiative may also come from the Ministry of Science and Technology or its equivalent. Alternatively, the initiative to use STI to accelerate the achievement of SDG goals may be led by a line ministry or local government as part of its SDG plans. The key point is that whatever its starting place, developing effective STI for SDG roadmaps requires interaction across a broad range of actors from different parts of government, academia, industries, entrepreneurs, civil society, development partners, and other stakeholders.

4. What are the scopes for the various levels of roadmaps?

The roadmap suggests **three levels:** subnational, national, and international (see Figure 3). The international community can assist in providing methodologies and technical assistance for developing the plans as well as support for implementation through **market channels** (e.g. private

investments) and **non-market measures** (e.g. collaborative public research, development assistance for STI infrastructure, human capital), and concerted efforts on STI for SDGs as **global public goods**.

Figure 2: Three levels of STI for SDG Roadmaps

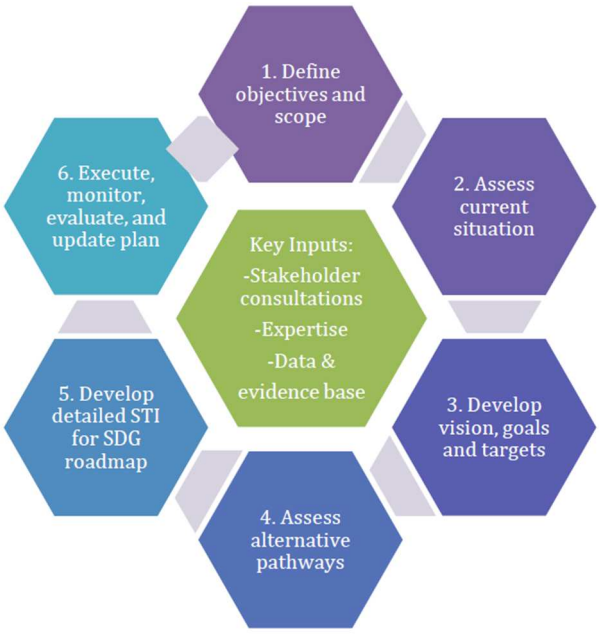


5. What are the six steps involved in the STI for SDG Roadmaps process?

This operational note proposes that governments follow **six steps** in developing STI for SDG roadmaps as indicated in Figure 2. They are presented as a circle because the steps are interdependent, and it is important that lessons learned from implementation are fed back into the whole process.

It also emphasizes that **three core inputs**: stakeholder consultations, expertise and experience, and data and evidence base are critical to all steps. The roadmaps requires not only science and technology but also an understanding of the whole deployment system. At each step of the process, there needs to be clear implementation plans and actions as well an explicit provision of finance.

Figure 3: Six Steps in the Development of STI for SDG Roadmaps and Three Core Inputs for Roadmaps



Three Core Inputs

1. **Stakeholder Consultations:** It is critical to get various stakeholder perspectives and to get stakeholder alignment. The consultation process can help resolve conflicting interests as well as secure greater buy-in from key stakeholders that will ensure the successful implementation and monitoring of the STI for SDG roadmap. The broader the scope of the STI for SDG roadmap, the greater the need to receive input about stakeholder needs and priorities in order to find a balance and ensure no group is left behind, especially the poor, indigenous, or disabled.

2. **Expertise and Experience:** Scientific, technical, managerial, and political expertise is crucial to help define objectives and scopes, develop visions, goals, and targets, and assess the current situation along with alternative pathways. Expertise is also needed to develop the specifics of the STI inputs into the SDG roadmap, monitoring progress on implementation, and evaluating what is and is not working for continuously improve the roadmap.

3. **Data and Evidence Base:** A strong data and evidence base is needed to better understand the development situation in the country or sector, the possible future development of technology and its application, and what specific indicators should be measured to track progress. Collecting accurate data and building the capacity to assess that data will be necessary in order to develop, implement, and monitor the roadmap.

Six Steps in the Development of STI for SDG Roadmap

1. **Define Objectives and Scope:** Roadmaps can be used for a variety of purposes and objectives (e.g. vision building, technology advocacy, stakeholder alignment, etc.) as well as at different levels and scopes (e.g. international, national, subnational, etc.). It is important to establish the objectives and scopes first as those will help countries prioritize their efforts and identify potential synergies and trade-offs among the SDG goals and targets.

Australia is a great example of a country that had a clearly defined objective for its STI for SDG Roadmap. Their Australia 2030 plan established five strategic imperatives along with 30 recommendations that would help them thrive in the global innovation race. The five strategic imperatives provided a strong foundation that guided Australia's efforts to utilize science, technology, and innovation to prepare and train its citizens to have the necessary skills to thrive in the future.

Australia's Five Strategic Imperatives:

1. Education
2. Industry
3. Government
4. Research and Development
5. Culture & Ambition

It is imperative that the necessary time and consideration is taken to initially develop the vision, objectives, and scope of the STI for SDG Roadmap. Having a clear vision will help make the rest of the process more efficient as a solid vision can guide efforts in later steps. It is also imperative that all relevant stakeholders are included in the formation of the vision, objectives, and scope. Stakeholders can range from government, universities, non-profit organizations, private businesses, community groups, individual citizens, and many other groups. All voices should be heard to ensure that the STI for SDG roadmap helps everyone and ensures that no one is left behind.

2. **Assess Current Situation and Emerging Trends:** It is important to first establish a baseline because it is necessary to know where a country is in order to set realistic goals and targets. Additionally, assessments should be made to identify what are the current capabilities for key stakeholders (e.g. government, private sector, NGO, civil society) and what areas need to be developed in order to achieve their goals and targets. The World Federation of Engineering Organizations (WFEO) has developed guidelines for producing national infrastructure report cards that evaluate the state of key infrastructure systems for railways, water, electricity, and many others.

3. **Develop Vision, Goals, and Targets:** There are various tools and methodologies already in place to develop visions, goals, and targets. Which to use will depend on various factors (e.g. level of detail, willingness of stakeholder participation, etc.) and each will have its own benefits as well as trade-offs.

4. **Assess Alternative Pathways:** There are many different innovations and pathways that countries can devote STI inputs to accelerate the achievement of SDGs. How countries utilize the combination of existing, emerging, and new technology/innovations will be highly dependent on their unique situation. Countries will have to determine which technology/innovations will most effectively solve their problems while also bringing the most benefit to the biggest possible audience. A key focus for many developing countries will be how to acquire and disseminate new technology that will help them achieve their goals. The choice of innovation pathways in STI for SDG roadmaps need to consider the existing STI capabilities and the extent to which they are aligned with the SDGs.

5. **Develop STI for SDG Roadmap:** Key instruments and priority actions need to be developed to accomplish the vision and contribute to the SDGs. A roadmap document, a long-term action plan, that builds on the previous steps needs to be created that introduces key findings of the baseline analysis and give an account of the roadmap deliberation process. An appropriate policy mix and instrument portfolio will need to be determined that will efficiently and effectively accomplish the SDGs.

6. **Execute, Monitor, Evaluate, and Update Plan:** After the development of the STI for SDG roadmap, execution or implementation is the key step to realize it. Additionally, for the plan to be credible and effective, there should be provisions for monitoring progress to determine whether it is on target or whether there are problems in implementation that need to be addressed. Plans for who will conduct the evaluation of the plan are also important and need to be addressed while mechanisms need to be established that will allow for the continuous horizon scanning for new and innovative technology. Lastly, an effective pathway needs to be established that will allow lessons generated from the evaluation of progress to be fed back to adjust the roadmap.

6. What are the objectives of road mapping and examples?

Vision building: Building a long-term vision of desired future expressed as statements and images. (e.g. TIFAC 2035 Technology Vision in India, ICC's Green Economy Roadmap)

Exploration of innovation and technology pathways: Exploration and assessments of alternative technology, innovation, or policy pathways to achieve a vision. This is often expressed as scenarios. (e.g. energy road mapping by CSIRO in Australia).

Technology advocacy: Technology and innovation advocacy supporting technology areas or specific technologies, often including research and innovation agendas with priority technology areas. (e.g. SPIRE in the EU, Forest products industry roadmap in the USA).

Stakeholder alignment: Building or strengthening stakeholder alignment to support the vision and technology, innovation, or policy pathways. (e.g. ICC's Green Economy Roadmap, Forest products industry technology roadmap in the USA).

Support for policy design and planning: Providing support for design and planning of policy portfolios or programs by elaborating selected technological and innovation pathways, often using milestones and quantitative targets. (e.g. Japan's New Low Carbon Energy Plan, EU SET-PLAN, RISEnergy in Sweden)

Support for policy implementation: Providing support for implementation and management of ongoing policy programmes or other initiatives. (e.g. EU SET-PLAN and underpinning roadmaps, Jamaica's National Energy Policy 2009-2030, Power Africa by USAID).

7. What are the key mechanisms on STI for SDGs under the 2030 Agenda?

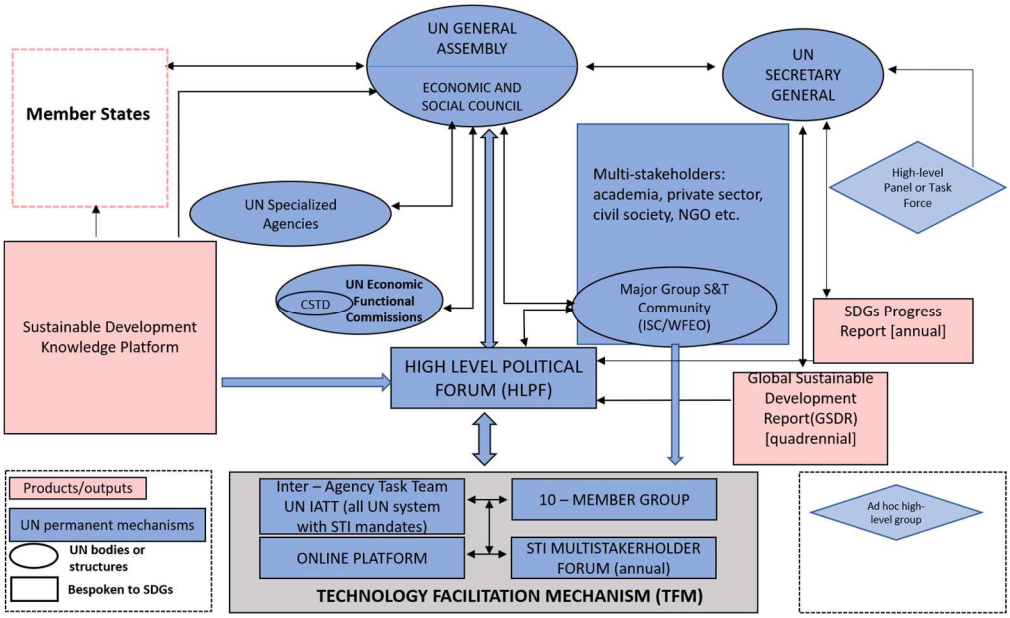
Figure 4 below summarized the key mechanisms on science, technology and innovation and mapped the main channels for engaging multi-stakeholders in the UN process.

The UN Technology Facilitation Mechanism (TFM) was created by the Addis Ababa Action Agenda to support the implementation of the Sustainable Development Goals (SDGs) and launched by the 2030 Agenda on Sustainable Development in September 2015.

Throughout both the intergovernmental negotiations on the post-2015 development agenda as well as in the preparatory process for the third International Conference on Financing for Development, taking place in 2014 and 2015, Member States clearly indicated that technology development, dissemination and transfer, as well as strengthening the scientific and technological capabilities of all countries represent key elements of the Means of Implementation of 2030 Agenda for Sustainable Development.

The creation of the TFM was of historic significance, as it brought back substantive STI discussions to UN Headquarters in New York, after decades of political gridlock over intellectual property rights and technology transfer issues. In the past three years, the TFM has explored a new multi-stakeholder model of work for the UN system, which to-date has engaged 42 UN entities, more than 100 expert staff of the UN system, and thousands of scientists and stakeholders to facilitate STI for the SDGs. The TFM's STI Forum also holds a special role, as it reports formally to the High-level Political Forum on Sustainable Development (HLPF) in support of its formal review of SDG progress and its explicit function to "strengthen the science-policy interface".

Figure 4: Mapping Key Mechanisms on STI under the 2030 Agenda



Source: authors.

8. What kind of support from the international community is needed?

A. Support market mechanisms for increasing the supply of existing STI elements

- Online platform supported by the UN's Technology Facilitation Mechanism – DESA
- More effective use of advances in technology and innovation in projects with multilateral finance in developing countries
- Work with key stakeholders to promote the deployment of critical technologies for important sectors such as water and energy
- Using public procurement to solicit innovative ways to deliver better goods and services more cost effectively to address SDG needs
- Increasing the overall volume of financing available for development of STI projects (e.g. grant money and soft loans from Official Development Aid (ODA)) to take the first level of risk in projects in order to make them more attractive to private financing[1]
- Promoting the use of alternative financing mechanism for STI projects such as crowdfunding and social investment funds

B. Support non-market mechanism for increasing the supply of existing STI elements

- Bringing students, scientists, and engineers from low income and developing countries to study and gain experience in developed or high-income countries. Alternatively, professors

[1] See BSDC, http://s3.amazonaws.com/aws-bsdc/BFT_BetterFinance_final_01192018.pdf

and students from advanced countries can teach local students face to face or through various digital media, such as Massive Online Open Courses (MOOCs), YouTube videos, podcasts, and computer-based learning systems.

- University collaborations in teaching science, technology, engineering, and math (STEM) subjects and cooperation in research to ensure graduates have the required skills
- Bilateral and international collaboration of public research institutes and researchers on joint interdisciplinary research programs focused on sustainability challenges.
- Supporting and increasing open data systems for scientific and technical publications and databases. (e.g. Launching an African Open Science Platform)
- Transferring frameworks, tools, methodologies, and technical assistance to help policy makers in receiving countries develop STI for SDG roadmaps.
- Developing communities of practice and other networks for sharing approaches and experiences.
- Improving the effective use of limited funds available for STI for SDGs by assisting countries undertake public expenditure reviews on STI for SDGs.

C. Strengthen the capability of developing countries to access and make effective use of existing technology and innovations and to develop their own technology and innovations

- Developing STI planning capacity in developing countries (e.g. government, private sector, and civil society organizations) to search, acquire, adapt, and disseminate technology and innovations. This may be an area where international assistance can have the most immediate impact. However, this does not involve only simple training but also includes higher education, technical assistance, and hands-on experience and twinning arrangements.
- Training policy makers on how to develop, implement, monitor, evaluate, and improve STI for SDG roadmaps. This includes education, technical assistance, twinning arrangements, design workshops, and sharing of experience across countries.
- Training scientists, engineers, entrepreneurs, managers, venture capitalists, and all other relevant stakeholders in technology and innovation through educational programs, foreign training, work and research experience, and twinning arrangements.
- Support the strengthening of STI-related infrastructure in developing countries (e.g. R&D labs, metrology standards and quality control systems and institutions, science parks, technology transfer agencies, accelerator labs, technology business incubators, etc.) Also share research between developed and less developed countries.
- Supporting international experimental STI projects by co-developing and demonstrating innovative approaches and projects along with social and business practices that have high impact potential on the SDGs. The lessons learned from these pilot projects should be shared internationally.
- Increasing STI-related technical assistance on projects for international development finance institutions, ODA, and commercial lending to more systematically leverage STI to help achieve the goals (STI for SDG roadmaps).

D. Create demand for new STI solutions for SDG needs and develop international coalitions and/or partnerships to create innovative systemic solutions and technologies to accelerate the attainment of SDGs in developing countries.

This has three levels:

- ***Challenge-led mission-oriented research and innovation.*** Examples include**:** Gates Foundation Grand Challenges in health and education, X Price Grand Challenges, Horizon 2020 (EU) Grand Challenges, Grand Challenges Canada, and UK[2].
- ***Develop coalitions to create global technology public goods in areas that can help the achievement of important SDGs, particularly those where there are big gaps in demand and supply.*** Some historical examples such as the Green Revolution, Vaccines against HIV/AIDS, as well as some ongoing programs tackling large developing country challenge such as PEPFAR (USAID led international program to eliminate AIDs), Feed the Future (US government-wide program to reduce hunger, malnutrition, and poverty through STI initiatives) and the international consortium to reduce ocean plastics. Other initiatives include guidance by international organizations like WFEO on the responsible use of data for artificial intelligence.
- ***Build partnerships to strive for a better STI policy integration towards a global STI system that enables collaborative STI efforts for SDGs.*** This is an ambitious goal to develop a new global STI system as a global public good. An example of what could be done are the ITU's AI for Good. A key challenge is that cross-national research efforts are inherently difficult to orchestrate and finance.
- **Examples of areas that would benefit from international partnership support are:**
    - SDG goals which are handicapped by low demand for STI and scarce supply SDG goals 1 (no poverty), 5 (gender equality), 10 (reduced inequalities) Multiple areas related to climate change and
      green economy (notably low-carbon energy) Health (see recently launched anti-microbial resistance R&D hub[3])
    - Safe water
    - Marine (including blue economy)
    - Electricity for all
    - Green chemistry (e.g. work on safe chemicals)
    - Natural disaster risk mitigation – collaboration on monitoring risks such as the International Meridian Circle Project (IMCP)
    - Natural disaster risk mitigation – 100 Resilient Cities
    - WASH Agenda for Change, NGO partnerships for implementing water and sanitation policies in developing countries

[2] See https://www.xprize.org/, https://ec.europa.eu/programmes/horizon2020/en/h2020-section/societal-challenges, https://www.grandchallenges.ca/, https://www.gov.uk/government/publications/industrial-strategy-the-grand-challenges/industrial-strategy-the-grand-challenges

[3] See https://www.gesundheitsforschung-bmbf.de/en/GlobalAMRHub.php

9. What are the Key Recommendations on Governments' Role from the G20 Development Working Group?[4]

- For governments seeking to develop a STI for SDG roadmap, their role is to set the strategic direction for the roadmaps through dialogue and input from all relevant stakeholders, while aiming for policy implementation coherence. Whenever possible, roadmaps on all levels should be assembled for monitoring overall progress and identifying underlying issues with political, social, economic, and scientific ramifications. Progress should be measured, as much as possible, using various reporting measures, in line with national processes and priorities.

- Promotion of "STIs for SDGs" should be aligned with national development strategies and STI policies for achieving sustainable and inclusive development. Governments should consider necessary preconditions for encouraging the advancement of science, technology and innovation, including mechanisms that protect intellectual property rights. The G20 should promote development of the underlying infrastructure that will enable STI for SDGs (e.g. digital infrastructure, ICT networks, research and development infrastructure, etc.). Due consideration should be given to investment in and promoting the active role of women and girls in STEM fields.

- To this end, governments should, as appropriate, allocate resources and encourage private sector investment to facilitate and implement the roadmaps.

10. What Governments Need to Do?

Assessing the capacity of the country's national innovation system

- Assess to what extent the country's innovation system can identify and match relevant STI inputs from the global system and to acquire and make effective use of them. This includes the capacity of government and other agents in the innovation system, firms and other critical implementing agents.[5]
- Review current laws and regulations and work with key stakeholders in the private sector to make adjustments that will allow businesses to thrive.
- Assess any potential gaps and roadblocks between the development of new technology and its deployment into the market. A key focus area can be identifying and eliminating corruption at all levels of government.

[4] Source: Guiding Principles for the development of STI for SDGs Roadmaps, G20, Tokyo.

[5] In a broader analysis of the STI system, it should also include an assessment of STI specialization and the competitive positioning of the country's key sectors and areas of research.

- Assess how well the national innovation system is drawing on relevant global STI inputs. What types of inputs is it getting or not getting through market and non-market channels? Is the national innovation system making full use of what can be obtained from abroad? If not, what are the obstacles and what is necessary to resolve them?
- Examine how well the country's policy and regulatory framework encourages rather than inhibits access to global technology and innovation. In addition, it is important to assess the adequacy of the country's social policies and policies that promote environmental sustainability as many technologies that can help with environmental sustainability require a favorable policy environment for them to be effective.
- Examine constraints in the country's infrastructure. One critical element is the country's STI infrastructure. This should include its R&D capacity and infrastructure to undertake relevant research to help track, monitor, and acquire global technology and innovation while also carrying out its own research.
- R&D to adapt and develop technologies/innovations relevant to its own needs. It should go beyond the STI infrastructure to include the ICT infrastructure (which is now so critical to take advantage of what digital technologies can offer), education and skills to use new technologies, and depth and flexibility of financial and labor markets.

Considering priority areas and required resources

The government should also consider priority areas where elements of STI can most usefully be obtained from abroad and what that requires in terms of changes to the national innovation system. There may be options which require fewer international inputs, but this may mean longer lead times. There may also be seemingly easy options of "quick technology transfer" which may mean faster results, but less building up of local capability. A critical issue here is also that of policy coherence. This is complex but is important because some STI roadmaps for the attainment of specific SDG goals may work at cross purposes with others. Explicit consideration should be given to what is expected in the short term (next 1-2 years) versus the medium term (3-4 years), and long term (more than four years).

- Interventions that may be possible in the short term are getting better access to information about what is available internationally; changing policies and regulations that may constrain that access, high impact training and awareness building among policy makers and key actors in the non-government sectors; accessing and deploying innovations that allow leapfrogging, such as smart cell phones rather than fixed line phones and computers, off-grid solar and wind electricity rather than central electric grids to reach dispersed rural areas, many preventive medicine practices and vaccines as opposed to more expensive treatment, etc. This should also include how to strengthen the ability of local researchers and research institutions to participate in international programs that are developing technologies relevant to attaining SDG goals.
- Programs that can be launched in the medium term (3-4 years) are strengthening key infrastructural elements as well as the broader innovation ecosystems that will be necessary to mobilize and deliver STI elements that can contribute to accelerate the SDG goals targeted in the country, strengthening some key STI infrastructure institutions than can help deploy relevant knowledge to meet the SDG goals, etc.

- Initiatives with a long-term horizon include investments in domestic R&D capacity to develop new technologies and effectively deploy them to where they are needed, developing world class research centers and universities; however, some actions to get the medium- and long-term outcomes have long lead times and need to be started even in the short-term.

Strategic development with the support of donor countries

On the government side, it will necessarily involve the ministries of foreign affairs, development, science and technology, telecommunications, industry and commerce, finance, and many others as well as relevant agencies and committees of Congress or Parliament and the head of government. It should also involve the mass media to build public support for the plans. It should also consider the STI needs of developing countries that the government aims to assist.

11. Self-check Guiding Questions for the Six Steps of Implementing STI for SDGs Roadmaps

Step 1: Define Objectives and Scope

- What is the objective of the roadmap?
- What is the scope of the roadmap?
- What specific SDG goals and objectives are targeted?
- How does it relate to the overall national development plan and other strategic documents?

Step 2: Assess Current Situation

- What is the current situation regarding the targeted SDG goal(s) and objectives?
- What financial resources are available or can be made available to meet those goals?
- What capabilities are available or need to be developed to meet those goals?

Step 3: Develop Vision, Goals, and Targets

- What is the overall vision for the STI for SDG roadmap?
- How ambitious is the vision?
- How will the vision be developed and how will ownership be sought?
- What are the specific goals and targets over the short (3-4 years), medium (5-8 years) and long-term (8-12 years to 2030)?

Step 4: Assess Alternative Pathways

- What technologies exist to help attain those goals?
- What does the STI system have to offer to enable the dissemination of the innovation?
- What emerging technologies may help to attain those goals?
- What new technology development possibilities may be available from new global development efforts?

- What alternative innovation pathways are there to reach those goals?

Step 5: Develop Detailed STI for SDG Roadmaps

- What will be the role of government vs the private sector or civil society?
- What will be adequate policy mix?
- Who will do what over what time period?
- What capacities will be necessary?
- What financing will be necessary and how will it be obtained and delivered?

Step 6: Execute, Monitor, Evaluate, and Update Plan

- How will the roadmap be executed?
- What monitoring mechanisms will there be?
- Who will do the evaluation?
- What mechanisms will there be for continuous horizon scanning for changing sub-national, national, and global and conditions?
- How will the lessons from the evaluation of progress on meeting targets and changing conditions be fed back to adjust the plan?

12. What are the Roles of Donor Countries?

There are many things that policy makers can do to more effectively support the systematic use of STI inputs to accelerate the achievement of SDG goals in developing countries:

- **Increasing its ODA to support STI inputs:** This includes reallocating resources from some other ODA activities to STI initiatives, and, when possible, increasing overall ODA resources to provide more support to STI in developing countries.

- **Leveraging activities being done by other agents or institutions in the country:** This includes providing incentives to increase the STI support given by other agents or institutions in the country such as matching research grants, scholarships, co-founding technical assistance, underwriting some of the risk in financing ventures; as well as providing leadership and coordination of activities in the country supporting greater STI inputs to help developing countries reach the SDG goals.
- **Taking or sharing a lead role in developing global coalitions and partnerships to develop global STI public goods for helping the attainment of SDGs:** Examples include initiatives such as PEPFAR and Feed the Future led by the U.S. government, or Disaster Preparedness led by Japan and the Digital Moonshot for Africa.

13. What are the existing methodologies to support country STI for SDGs roadmaps?

There are currently no existing methodologies; however, knowledge and expertise are currently scattered and can be compiled to formulate new methodologies to support STI for SDG roadmaps. STI roadmaps that help to realize the SDGs are central in the work of UN agencies. The UN Inter-agency Task Team (IATT), including the World Bank, UN-DESA, UNCTAD, UNESCO, UNIDO, UN-ESCAP, ESCWA, FAO, WIPO and UNU, among others, works towards developing STI for SDGs roadmaps. Expert consultations in New York, Tokyo, Brussels, and Nairobi led to the development of a joint guideline and shaped cooperation with selected countries in this field. The UN-IATT has also developed joint UN courses that strengthen countries' capacities in STI for the SDGs. The recent G20 outcome package (Osaka Leader's Declaration, 2019) contains guiding principles for this work. There is now a need to expand and involve more countries in developing STI roadmaps for the SDGs.

The rationale to facilitate a multi-stakeholder collaborative approach is clear. At present, the efforts supporting STI roadmaps are fragmented at international, regional, national, and sub-national levels, and do not necessarily have the SDGs as a focus. 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. 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 international stakeholders. Therefore, this initiative by the IATT is aimed at adding value through facilitating a common approach and developing coherent frameworks to examine gaps, synergies, and trade-offs that will help prioritize actions in order to strengthen national STI systems, promote cross-sectoral collaborations, and Goal-specific "deep dives" for the SDGs.

Initially, the primary focus was on exchanging views and best practices on guidance, principles, and frameworks/methodologies for country and international level STI for SDGs roadmaps. This IATT effort resulted in the publication of a joint guideline which is available on the web at https://sustainabledevelopment.un.org/TFM#roadmaps. The guideline will now be used in a collective effort by the IATT to support a group of champion countries to develop STI for SDGs roadmaps with all relevant stakeholders.

The summary table in the Annex on STI roadmap tools and methodologies is a coordinated effort led by UN DESA to inform STI policy makers and stakeholders working on STI for SDGs roadmaps on resources and expertise available to them. The inventory of methodologies in the table provide a one stop shop to guide policymakers and development practitioners to better achieve the SDGs through STI. It will be a living document, to be updated periodically based on evolving knowledge and experience with its use.

14. What support to get from the Pilot Country Programme?

The objectives of the Programme include the following:

- Test out the draft Guidebook on building STI for SDGs Roadmaps as a policy- making and communication tool for Member States;
- Build capacity for and scale up adoption of the Member States' STI for SDGs Roadmaps;
- Promote good practices, knowledge sharing, peer learning, international cooperation and partnerships on design and implementation of such roadmaps;
- Maximize opportunities and mitigate risks of STI and frontier technologies to accelerate the achievement of the SDGs; and institute mechanisms to continuously scan the horizon, analyze the gaps, track progress, and inform corrective measures.

Following the broader TFM mandate within the Agenda 2030 framework, the Programme is designed as a non-intergovernmental and multi-stakeholder engagement process. The Programme will initially focus on demonstrating concrete value-added for Member States as part of their national processes to design and implement such roadmaps as integral elements of national sustainable development strategies. For IATT agencies and other contributing partners, the Programme will create stronger synergies and complementarities in the field of STI policy, technical assistance and related capacity development and investment to Member States. Beyond 2019, the Programme will aim at mobilizing dedicated support funding, upon Member States' early experiences and demands for further support, including for enabling arrangements such as online platforms and offline forums for matchmaking, knowledge, and experience sharing.

Pilot activities can constitute, but are not limited to, any of the below:

- Define objectives and scope of national STI for SDGs Roadmap
- Evaluate current situation, gaps in achieving SDGs and opportunities/risks related to STI
- Assess alternative pathways of utilizing STI toward achievement of the SDGs
- Develop vision, goals, and targets related to utilizing STI toward the SDGs
- Develop a detailed STI for SDGs Roadmap
- Execute, monitor, evaluate, and update current STI for SDGs Roadmap

Pilot programmes are expected to build on existing, ongoing, or planned activities as part of national processes, and are not meant to necessarily produce a new set of "Roadmap" documents. The Programme rather aims at strengthening countries' ownership and momentum on STI for SDGs, by surfacing and connecting country-by-country practices and advancing good practices and peer learning. Building on pilot experiences, the Programme after 2019 will aim at instituting mechanisms to continuously scan the horizon, analyze the gaps, track progress and inform national and international corrective measures. Pilot countries are invited to join the policy advocacy efforts in 2019, including through STI Forum, HLPF and UNGA, to elevate STI for SDGs agenda and step up international efforts and collective action in support of STI for SDGs Roadmaps.

Figure 5 Current Timeline of the Pilot Country Programme

15. What early pilot experiences on adaptation of the step-by-step guidance?

- Step 1: Defining objectives and scope takes time – 6 months to reach consensus in Kenya even with the clarity of its "Big Four" agenda;
- Step 2: Assessing current situation, both on SDGs demands/gaps and STI supply/capabilities, requires competent agencies (few countries would have one). Assessing emerging trends is likely a challenge and international partners could consider how best to support this analysis in real time given the fast-changing global environment;
- Step 3: Developing a vision, goals and targets varies widely across the pilot countries because of their different institutional set. The analysis of potential synergies and trade-offs among different goals are also inadequate. More country specific advice on trade-offs and complementarities in the framework of the six entry points provided by the GSDR2019 would be useful;
- Step 4: Assessing alternative pathways is arguably most complex step, requiring stakeholders representing different stages in innovation chain (e.g. new R&D vs diffusion and adaptation). Scarcity of foresight analyses adequate to developing country contexts adds to this challenge. This is another area where assistance from international partners could be beneficial;
- Step 5: The pilots are at different stages of their development of STI roadmaps. Important elements that most pilot countries still have to address are how the actions of government and other key actors will be coordinated and how to arrange financing issues for the plans. It is an important opportunity for the international community to provide support on stimulating the coordination and the implementation;
- Step 6: Few ongoing pilots has put monitoring and evaluation systems in place or considered learning and feedback mechanisms as an explicit component of the STI for SDGs roadmaps (arguably, with an exception of India), which is a critical step to make adjustments and corrections while implementing the roadmap.

16. What does a proposed joint template on development of STI Roadmaps for the SDGs look like?

A successful STI roadmap contains several key components. The UN Inter-agency Task Team aims to promote a common approach and develop coherent frameworks to examine gaps, synergies and trade-offs, and prioritize actions in order to strengthen national STI systems, promote cross-sectoral collaborations and Goal-specific "deep dives" for the SDGs. With this objective, for the purpose of discussion, it is proposed a joint template for development of the STI Roadmaps for the SDGs below.

Items	**Brief Description**
Country/Region	
Overview of national technology and innovation eco-system	*Overview and mapping of the STI initiatives,* *Legal system related to STI* *National R&D agencies* *Public support to incubators, innovation parks etc.*
Vision and Goals: a clear and concise set of quantified goals and targets, as well as desired timeline	*Vision and mission statement* *What does country want to achieve in STI for the SDGs?*
Milestones: interim performance targets for achieving the goals	*Interim performance targets for achieving the goals, pegged to specific dates*
Gaps and barriers	*A list of any potential technology gaps, market structural barriers, regulatory limitations, culture acceptance or other barriers to achieving the goals and milestones*
Action items	*How are countries or other stakeholders going to use the roadmaps? What actions to be taken by when*? *It will include a list of the most important actions that need to be taken in order to achieve the goals and the time frames.*
Case studies	- *Health and human well-being* - *Clean energy and climate* - *Agriculture and food nutrition* - *Urban and peri-urban development* - *Education* - *Environment and global commons*
International cooperation (optional)	*Expected and on-going international cooperation and collaborations with partners*

Annex: Table of Summary of STI Roadmaps ---- Tools and Methodologies

	UNCTAD	UNESCO	WIPO	World Bank	EU/JRC
Methodologies (instrument)	**Science, Technology and Innovation Policy (STIP) Reviews**. UNCTAD prepared a formal methodology for STIP reviews in 2011, and a revised methodology in 2019 to better align STIP Reviews with sustainable development and the SDGs within a flexible framework. STIP Reviews are undertaken utilizing an assessment process through which a country's STI stakeholders can reach a clear understanding of the key strengths and weaknesses in their STI systems and identify strategic priorities and policy options for their development. They provide STI policymakers with policy options to strengthen technological capabilities and innovation capacity of firms, industries and the country. The process aims to strengthen collaborative linkages among key actors in the STI system. The revised framework builds on the	a. Mapping Research and Innovation country profiles and on-line survey of STI policies and policies instruments as part of the **Go-SPIN** platform http://gospin.unesco.org . Go-SPIN is a methodological tool to map national science, technology and innovation (STI) landscapes and analyses STI policies and their implementation. The open-access platform offers innovative databases with powerful graphic and analytical tools for the use of decision-makers, parliamentarians, universities, knowledge brokers, companies, specialists and the public, with a complete set of diverse information on STI policies. b. *"UNESCO Science Report"* provides every 5 years a comprehensive scientific landscape at global, regional and national level, reflecting the insights of socio-economic, geopolitical and environmental trends; c. The Gender advancement in STEM (UNESCO SAGA project) provides tools and capacity-building to Member States for helping them defining a conceptual and methodological framework to	Capacity building on technology transfer, collaboration with organizations and institutions in the area of IP and technology development, and the transfer, adaptation and use of appropriate technology in LDCs constitute a large part of WIPO development assistance. **a. National IP strategies (NIPS) or plans** reflect assistance in the above areas and thus support national STI plans or policies. A methodology is available to assist Member States in the formulation of national IP strategies, which aim, *inter alia,* at identifying the intersection between IP and STI policies, promoting a dialogue among concerned stakeholders, and creating an enabling environment for STI, technology transfer and IP management. b. A consolidated methodology also exists for the establishment of **Technology and Innovation Support Centers (TISCs)**, which facilitate the access to, and the use of, technological information, scientific and technical literature and databases, and build capacity to support innovation, technology transfer and commercialization-related services.	STI policy diagnostics**. Public expenditure reviews on STI**. The objective is to assess whether government's reallocation of resources from the market toward STI, through taxation and public expenditures, improves economic welfare as compared to the steady-state situation.	**Smart Specialization** is an innovative approach that aims to boost growth and jobs in Europe, by enabling each region to identify and develop its own competitive advantages. It identifies the strategic areas for intervention based both on the analysis of the strengths and potential of the economy and on an Entrepreneurial Discovery Process (EDP) with wide stakeholder involvement. The result is localized STI roadmaps that priorities the public and private investment into a limited number of domains that tackle social, environmental and economic challenges and opportunities. Through its partnership and bottom-up approach, smart specialization brings together local authorities, academia, business spheres and the civil society, working for the implementation of long-term growth strategies supported by EU funds. Smart specialization also encourages international partnerships ('Thematic Platforms') for deep dives into specific areas Research and Innovation Observatory (RIO) country reports (https://rio.jrc.ec.europa.eu/en/country-analysis); peer-review of national research & innovation system. Promoting Smart Specialization Strategy to analyze a country's region's situation. RIO is part of the European Commission's information platform called RIO-PSF, a reference and key source of information for European and national policy makers as well as other stakeholders in the field of R&I policy (https://rio.jrc.ec.europa.eu/en). It delivers analysis, insights, statistical data and best practices on designing, implementing and

	established approach of addressing the fundamental issue of how STI can support the economic development goals of growth, higher productivity, structural transformation and economic diversification, and considers the role of STI in reorienting development towards more inclusive and environmentally sustainable outcomes. They generally also include some elements of capacity building.	integrate, monitor and evaluate gender equality in STEM and improve policies.			evaluating research and innovation policy at EU and national levels.
# of Countries completed	15	68 countries in on-line platform; 8 GOSPIN country profiles and 7 SAGA country reports	55+78	10+15	30 completed + 22 ongoing
Latest years that the Countries completed	1999-2017		2017-2018	2013-2017	Smart Specialization: 2014-2020, continued in 2021-2027 RIO country reports (ex-ERAWATCH): 2014-2018

Benchmarking Indicators	• R&D inputs and outputs; • Firm-level innovation activities, including technological innovation, organizational innovations; • Access to financing for innovation; • ICTs; • FDI and trade structure; • Education; • Productive structure; • Governance of innovation.	• R&D inputs and outputs (human resources, financial resources); • R&D outputs (publications, patents); • Innovations (high technology exports, global innovation index, product innovation, process innovation, innovative firms, etc.); • Education (financial resources, literacy, higher education) ● STI policies and instruments ● Gender in STI (policies and instruments)	Number of countries in various stages of NIPS development: ● Considering ● Formulating ● For final approval ● Adopted ● Implementing Indicators for TISCs: ● **Maturity level 1**: Service Level Agreement signed with WIPO and at least an annual report on national TISC activities. ● **Maturity level 2**: maturity level 1 + basic patent information searches; ● **Maturity level 3**: maturity level 2 + value added IP services, e.g. drafting patent landscape reports. Indicators for benchmarking TTOs (Technology transfer offices): • The number of IP disclosures; • The number of IP applications; • The number of grants; • The number of licensing contracts; • The licensing revenue; • The number of start-up companies; and • The number of joint ventures.	148 structural and qualitative variables for 146 countries to measure their performance on the four Knowledge Economy (KE) pillars: (1) Economic Incentive and Institutional Regime, (2) Education, (3) Innovation, (4) Information and Communications Technologies. Variables are normalized on a scale of 0 to 10 relative to other countries in the comparison group.	RIO country reports: • Inputs – investment$ HR (human resource in ST, sectors of performance, source of funding) • Framework condition (international co-patenting, public R&D financed by business enterprise) • Innovation output (highly cited publications) • Impact • Supplementary Smart Specialization: ● Context, input, output and outcome indicators to measure the logic of intervention
	UNCTAD	**UNESCO**	**WIPO**	**World Bank**	**EU/JRC**
Country Focal Point/ main counterpart	Ministry for S&T; Ministry of Industry; Ministry of Economy; Ministry, Council or Agency responsible for STI policy	Ministry in charge of STI	Ministry of Industry or Science and Technology or Foreign Affairs	Finance ministry, planning commission	National/regional smart specialization team – inter-ministerial or inter-departmental body that usually comprises of the ministries of science and education, economy, regional development and EU integration/affairs

Major Stakeholders	Government officials from a broad spectrum of ministries and agencies (such as science and technology, education, economy, industry, agriculture, trade, development planning, finance, health, enterprise development, investment promotion, export promotion, competition authority), firms (small and medium-sized enterprises and larger enterprises), entrepreneurs and start-ups, universities and other education institutions, R&D institutes, and non-governmental organizations	All science-based ministries (Education, agriculture, health, industry, planning etc.); Scientific institutions, Universities, research institutes, academies, knowledge brokers, companies, civil society, STI commissions in parliaments	National IP office(s), inter alia, relevant government departments, universities / research institutions, SMEs, inventors, creators, legal practitioners, NGOs	Policy makers, implementing bodies, public research institutes, higher education institutions, and private sector	Research institutions, policy makers, national and subnational authorities, academia, business spheres (business associations, clusters, innovative companies etc.) and the civil society, intermediaries (technology parks, incubators etc.)
Steps it Covers (re: Guidebook)	Steps 1, 2, 3, 4, possibly 5	Step 1, Step 2, Step 3, Step 5	Step 1, Step 2, Step 3	Step 1, Step 2, Step 3, Step 5	Step 1, Step 2, Step 3, Step 5, Step 6
Expected Outcomes (what country can get out of these)	• Improve policy formulation and implementation, including through an improved national dialogue in the area of STI; • Develop stronger linkages and more effective interactions among the actors in the NSI; • Identify measures that encourage the development of absorptive capacity by the various actors in the NSI and facilitate the transfer of technology through international trade, FDI and other	• Promotion of the development of green and social-inclusion science, technologies and innovations ● Development and implementation of Evidence-based and inclusive STI policies • Strengthening gender equality for research and innovation. • Promotion of indigenous knowledge systems. ● Strengthening capacities in STI policy-making and promotion of gender equality • Strengthening the social appropriation of scientific knowledge and new technologies.	a. National IP strategies • The country owns the results of the IP audit exercise; • By ensuring the active participation of all key IP Stakeholders, the national IP strategy is more likely to enjoy a high level of support and to be successful in the long term; • Developing the skills of national experts to develop the national IP strategy b. TISCs ● Access to patent and non-patent databases ● Networking and exchange of experiences	• Research excellence, • science industry collaboration and technology transfer • business R&D and startups • non-R&D innovation and technology adoption.	• A New Boost for Jobs, Growth and Investment • Reduce territorial inequalities • Identify the territory's own strengths and comparative assets • Define a shared vision for the economic transformation of regions based on a prioritization of research and innovation investments in competitive areas Mobilize stakeholder and encourage partnerships International partnerships for 'deep dives'

	channels of transfer of technology; • Identify specific short-, medium- and long-term actions that can lead to stronger technological capabilities in firms, networks, industries and the country, including responding to specific sustainable development challenges.	• Open Science	• Quality services on patent search and analysis • Patent filing and drafting support • Training on access to and use of patent information • Commercialization and technology transfer support • Increased awareness on IP contributing to economic growth		
Leading Supporting Entity	UNIDO, UNDP, UN Regional Commissions (ECA, ECLAC, ESCAP, ESCWA, UNECE), UNESCO, World Bank, ILO, WIPO, UNOPS, Technology Bank for LDCs, ITC			IBRD, IDA, IFC, MIGA	European Commission and …
# of Countries expected to complete in the coming years					

Note: information of the table is collected by DESA from UNESCO, UNCTAD, WIPO, World Bank, and EC/JRC.

Table continued …

	OECD	UNIDO	UNEP	ITU	G-STIC
Methodologies (instrument)	OECD plays a leading role in the collection and interpretation of **data on science, technology and innovation** and has developed the analytical frameworks *Oslo Manual* and *Frascati Manual* as the guidance in related data collection and use. The STIP Compass is an initiative of the European Commission and the OECD to collect together in one place quantitative and qualitative data on national trends in science, technology and innovation (STI) policy for a comparative performance of national science and innovation systems with a focus on its member economies and several non-members. Furthermore, the OECD Innovation Country Reviews, conducted at a country's request, provide concrete policy recommendations tailored to the country context. 30 Innovation Policy Reviews have been completed since 2006. In 2017, the OECD launched Reviews of Digital Transformation to analyses recent developments of the digital economy in countries, review policies related to digitalization and make recommendations to increase policy coherence in this area. Two major flagship publications – the STI Scoreboard and the STI Outlook – published biannually benchmark STI performance and review key trends in STI in OECD countries and a few major partner economies.	UNIDO offers analytical and policy advisory services to provide Member States with tools to shape appropriate industrial strategies and policies that can help them upgrade and accelerate industrial development and competitiveness. **The EQuIP (Enhancing the Quality of Industrial Policies)** methodology allows member states to (1) assess structural change, with emphasis on increasing technological complexity of manufacturing, (2) benchmark industrial performance relative to competitors, and (3) identify areas where there is potential for expansion, upgrading, and diversification. The methodology also allows appraisal of performance from environmental and inclusiveness perspectives.	**Technology Needs Assessment (TNA)**: The TNA process has three main steps and related objectives: 1. To identify and prioritize mitigation/adaptation technologies for selected sectors/ sub-sectors 2. To identify, analyses and address the barriers hindering the deployment and diffusion of the prioritized technologies, including enabling the framework for the said technologies 3. Based on the inputs obtained from the two previous steps, to draw up a TAP with suggested actions presented in the form of project ideas.	**ICT centric innovation ecosystem country review**. The ITU-D country review methodology focuses on the interaction of two core components. The first is a process of desk research, data analysis and expert driven policy advisory. The second is a consultative process focused on working with the key stakeholders in the innovation ecosystem to gather information based on the views of grassroots actors. These two interactions can develop a stronger understanding of the ecosystem. It can also lead to a mixture of outcomes and recommendations. In addition, a toolkit for strengthening ICT-centric ecosystems, features an analysis of national ICT-centric innovation ecosystems and helps connect and share knowledge and experiences between stakeholders from different ecosystems. It offers a comparable and multi-stakeholder driven framework for assessing, making context specific guidelines and recommendations to foster digital entrepreneurship and ICT centric innovation ecosystems.	G-STIC aims at **accelerating the development, dissemination and deployment of technological innovations** that enable the achievement of the SDGs. G-STIC focuses on innovative, integrated technological solutions that have the potential to leapfrog economic development towards achieving the SDGs and address several SDGs at the same time. In its second phase (2019-2020) G-STIC will identify non-exhaustive clusters of market-ready innovative technological solutions for the SDGs, as well as the critical levers of change needed for the transformations, under different socio-economic conditions

# of Countries completed	Country coverage: 36 Member Countries plus major non-member economies Country Reviews completed to date: 20+10 non-member countries	8 + 1 regional East Africa Community	36	4	Global conference series and expert networks, community of practitioners
Latest years that the Countries completed	2006-2019	2006-2019	2011-2016	2016	2018
Benchmarking Indicators	• **Main Science and Technology Indicators (MSTI) Database** showing 72 standard tables on expenditure on research and experimental development (R&D) as well as on R&D personnel and researchers (62 indicators), patents (four indicators), technology balance of payments (three indicators) and international trade in R&D-intensive industries (three indicators). • Research and development (R&D) Database • Research and Development Statistics • (Analytical Business Enterprise Research and Development – ANBERD) • Industrial data (Structural Analysis Database – STAN) • STAN Input-Output (I-O) Database • STAN Bilateral Trade by Industry and End-use (BTDIxE) • Patent Statistics Databases • Broadband Portal • Key ICT Indicators ranging from telecommunications investment to broadband connections per 100 inhabitants • Activity of Multinational Enterprises (AMNE) Database • Innovation indicators • Nanotechnology indicators •Careers of Doctorate Holders	UNIDO's Competitive Industrial Performance Index (CIP) benchmarks the ability of countries to produce and export manufactured goods competitively: • Manufacturing Value Added Indexes 1. Manufacturing Value Added Per capita Index 2. Share of Manufacturing Value Added in GDP Index 3. Share of Medium and High-Tech Activities in Total Manufacturing Value Added 4. Industrialization Intensity Index • Share of World Manufacturing Value Added Index • Manufacturing Export Indexes 1.Manufacturing Export per Capita Index 2.Share of Manufacturing Exports in Total Exports 3.Share of Medium and High-Tech Activities in Total Manufacturing Export 4.Index Industrial Export Quality Index 5.Share in World Manufacturing Export Index New indicators on industry 4.0, climate change and gender currently in a pilot phase.	• Atmosphere • Biodiversity • Coastal and marine areas • Energy • Forests • Freshwater • International environmental initiatives • Stratospheric ozone depletion • Unban area	• Economy, Demography • Fixed network • Mobile network • Traffic • Prices of broadband • Revenue/Investment • Employees • Internet • Broadcasting • Quality of service	Integrated technological solutions need to be: - Socially acceptable - Environmentally sound - Economic feasible - Economically affordable (who pays for the deployment at scale of the innovation?) - Market or near-market ready - Innovative

	Indicators • TiVA Database (Trade in Value-Added) • Bilateral Trade by Industry & End-use (BTDIxE) • Employment Dynamics & Young Firms (DynEmp) • Global Value Chains & Trade in Value Added • STAN STructural ANalysis Database •ICT Indicators				
	OECD	**UNIDO**	**UNEP**	**ITU**	**G-STIC**
Country Focal Point/ main counterpart	STI and Economy Ministries	Ministry of industry / Ministry of economy			
Major Stakeholders	Government, Businesses, civil society including scientific organizations, and academia,	Government, industry, civil society, academia	Academia, private sector, civil society, government ministries, farmers or households. (Areas: transport, environment, agriculture, energy, water, etc.)	Policy makers, Entrepreneurs, public sector, private sector, academia, entrepreneurial support networks, financial actors, development actors, innovators	Local and national decision makers/investors in infrastructure, Private sector innovators and decision makers STI institutions, technological researchers and engineers
Steps it Covers (re: Guidebook)	Step 1, Step 2, Step 4	Step 1 and Step 2	Step 1,	Step 1,	Step 4
Expected Outcomes (what country can get out of these)	• Promote transition towards further knowledge-based societies and economies by enhancing national STI capabilities. (The three core objectives of this strategic plan are: 1. Improvement of national economic competitiveness through STI.2. Increasing quality of life and fostering social development. 3. Sustainable development mainly through the application of STI to problems of sustainable development, including the protection of natural resources) • conduct diagnostic approaches that enable innovation to promote sector an d broad-based growth and human capital. • support countries through assessment and advisory service in	• Use of indicators to inform industrial development strategies aligned with SDG's, particularly SDG9; • Diagnostic of industrial performance according to technological content of manufacturing value added and exports both across time and relative to competitors; • Strategic advice where there is potential for expansion, upgrading, employment generation or enhanced energy efficiency in the industrial sector; • Diagnostic tool to assess trade-offs between industrial upgrading and environmental and inclusiveness (gender).	• Directly use the inputs from their TAPs to develop their NDCs, NAPs and NAMAs, link outputs explicitly to other national processes or develop the analysis and/or plans detailed in their TNA/TAP reports. • Use the TNA methodology to assess other local needs under separate processes or projects. • Further develope the project ideas articulated in the TAPs in order to draw up concrete project proposals as a step towards implementing	One objective directly affected ecosystem community engagement, and another impacted access to market for SMEs: ● strengthening and support to start-ups for digital and online services as well as delivering alternatives in relation to financial support, such as the ICT innovation vouchers; ● establishment of ICT incubators; ● supporting of ICT clusters businesses in accordance to pillar 52 of the European Digital Agenda 2020. This objective is fully in-line with the strategy of leveraging ICT to drive productivity cross-sectoral and upgrade industries.	Input to alternative roadmaps to achieve the SDGs using cutting edge, emerging and market ready technological solutions Insight in what the economic fabric of the future might look like. Participation in - and contribution to - emerging networks of innovators.

	areas of specific interest to the country. • provide global policymakers with evidence-based information to improve the policy mix and learn from one another's experience		investment-ready projects with national or international funding.		
Leading Supporting Entity	• Committee for Scientific and Technological Policy (CSTP) and its four subsidiary bodies that cover specific work areas from STI statistics and indicators (NESTI) to science policy (Global Science Forum), technology and innovation policy (TIP) and bio-nano-and converging technologies (BNCT) Business and Industry Advisory Committee (BIAC) • Development Assistance Committee • OECD Development Centre • International Transport Forum • International Energy Agency • Nuclear Energy Agency • Trade Union Advisory Committee	• International assistance • Business and Industry • Academia and Research	• Environment and Natural Resources Information Networking (ENRIN) programme • Reginal Centres • FAO • Multilateral Environmental • Business and Industry • NGOs • Academia and Research	• Private sector • Academic institutions	VITO, Belgium and FIOCRUZ, Brazil GIEC (China) TERI (India) IITD (India) ACTS (Kenya) Nacetem (Nigeria)
# of Countries expected to complete in the coming years		3			

Note: information of the table is collected by DESA from OECD, ITU, UNIDO and G-STIC.