

Workshop on Science, Technology and Innovations for SDGs

Meeting Room H, United Nations Conference Centre (UNCC), ESCAP, Bangkok, Thailand,

27th February – 1st March 2019

Co-organized by DESA, ESCAP, UNCTAD

Report of the meeting



Contents

Key Recommendations	3
Introduction.....	3
Summary of Discussions	4
Session 2a: STI for ensuring inclusive and equitable quality education and promote lifelong learning opportunities for all (SDG 4)	4
Session 2b : STI for Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels (SDG 16).....	6
Session 2c: STI for promoting sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all (SDG 8).....	7
Session 2d: STI for taking action to combat climate change and its impacts. (SDG 13)	9
Session 2e: STI for reducing inequality within and among countries (SDG 10).....	11
Session 3: Promoting synergies with indigenous knowledge for the achievement of the SDGs....	12
Session 4: Emerging technology clusters and the impact of rapid technology change on the SDGs	14
Session 5: Taking stock and lessons-learnt from the start-up phase of the TFM since 2015.....	16
Session 6: STI roadmaps incorporating SDGs and their implications for policy and capacity building	18
Session 7: Gender and STI for SDGs	20
2019 STI Forum Volunteers.....	23
Programme	25
List of participants	34

Key Recommendations

1. The following conclusions and recommendations emerged from the discussions:
 - a) STI Forum 2019 could be structured similar to the successful format of 2018. It will thus include sessions on the SDGs under review at HLPF 2019 (SDGs 4, 8, 10, 13, 16), discussion of their interlinkages, and some other cross-cutting themes including: local and indigenous knowledge; emerging and exponential technologies and their impacts on the SDGs; STI roadmaps for the SDGs, gender issues and capacity building; and the TFM online platform. These sessions would be complemented by a coherent series of special panels, side events, exhibitions and demonstrations of solutions.
 - b) The present Workshop collected a wealth of facts, challenges, lesson-learnt, solutions, and initial ideas for structure, participation, format and potential substantive outcomes of the various sessions at the STI Forum 2019, as they are expected to closely correspond to the sessions at the present Workshop. It was suggested to use the wealth of material summarized below and presented to the Workshop for the purpose of preparing in-depth substantive background notes for the Forum.
 - c) Members of the 10-Member Group and of the IATT, as well as participating experts expressed their willingness to continue working together in support of the TFM in general and the STI Forum in particular, regardless of potential changes in membership in the future.
 - d) The STI Forum process will continue to work cumulatively, building on the summaries of co-chairs of previous Forums. Similarly, the present Workshop and previous meetings and activities under the TFM will continue to aim working cumulatively, building on each other and spurring joint action and partnerships.

Introduction

2. The United Nations Department of Economic and Social Affairs (DESA), in collaboration with United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) and United Nations Conference on Trade and Development (UNCTAD) organized the Workshop on Science, Technology and Innovation (STI) for the achievement of the Sustainable Development Goals (SDGs) as a preparatory event for the 2019 STI Forum, as well as to collect inputs for the development of the Online Platform – a component of the Technology Facilitation Mechanism (TFM). The Workshop was held at United Nations Conference Centre (UNCC), ESCAP, Bangkok, Thailand.
3. The objective of the Workshop was to contribute to the preparations of the STI Forum 2019 by mobilizing all stakeholders to share information on trends in the deployment of science, technology and innovation for the SDGs 4, 8, 10, 13, 16, including specific solutions and achievements, state of the art expertise on specific issues and practice areas, emerging priorities, critical knowledge and innovation gaps, as well as their views on ways of mobilizing science, technology and innovation responses to address these gaps. The Workshop also aimed at collecting inputs for the development of the TFM Online Platform.
4. The Workshop was organized around the theme of the STI Forum 2019 will be: "STI for ensuring inclusiveness and equality, with a special focus on SDGs 4, 8, 10, 13, and 16". In addition, some cross-cutting issues were also taken up, as decided by the 2018 Forum, including the role of traditional knowledge, potential impacts of emerging technologies, STI roadmaps for the SDGs, barriers for scaling-up solutions, the TFM online platform, and ways

to ensuring that STI benefits all, leaving no one behind. Following a formal opening, the Workshop was held in an interactive roundtable style, moderated by members of IATT and 10 Member group.

5. Through the STI Forum, the Workshop ultimately contributed to the HLPF review of SDGs 4: (inclusive and equitable quality education and promote lifelong learning opportunities for all), 8 (promoting sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all), 10(reducing inequality within and among countries), 13(taking action to combat climate change and its impacts), 16(promoting peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels).
6. The present Report summarizes the outcomes of the Workshop which will serve as guiding reference and inputs to the STI Forum 2019 and HLPF 2019.
7. The Workshop was attended by 41 technology experts from Governments, the private sector, financial institutions, non-governmental organizations, and research institutions. This included six of the 10 members of the TFM Group of 10 High-level Representatives (10-Member Group), as well as selected experts and representatives of governments and major stakeholders of the TFM process, as well as selected Members of the UN Inter-Agency Tasks Team on STI for the SDGs (IATT).

Summary of Discussions

Session 2a: STI for ensuring inclusive and equitable quality education and promote lifelong learning opportunities for all (SDG 4)

Moderator:

- Dr. Agnes Lawrence Kijazi (United Republic of Tanzania), Director General, Tanzania Meteorological Agency (TMA) (10 Member Group – co-chair)

Panelists:

- Dr. Manpreet S. Manna, Former Director, Administration & Swayam, All India Council for Technical Education, Ministry of Human Resources Development, India
- Ms. Jonghwi Park, UNESCO Asia Pacific Regional Bureau for Education
- Ms. Marianne Mensah, International Executive Director, Universite Cote d'Azur, France

Discussant:

- H.E. Mrs. Elizabeth Thompson, Ambassador Extraordinary and Plenipotentiary, Permanent Representative of Barbados, co-chair of the STI Forum

8. Session 2a discussed the status of existing knowledge, explored the potential for how STI can further support the achievement of SDG4, and addressed the main knowledge gaps and challenges. It also presented recommendations for future actions.

Key issues and facts reported

9. Speakers highlighted that women are excluded from the higher education without an inclusive educational environment.

10. Participants agreed that although an increasing number of children can get education in primary and secondary school, the quality of education is still a challenge.
11. Speakers and participants noted that SDG 4 targets such as skills, gender, literacy, facility and teachers can be specifically advanced through ICT training, resources and skills.
12. Speakers emphasized that SDGs can be used as a tool of creativity in educational institutions to create an ecosystem of innovation.

Most effective ways for STI to support the achievement of SDG 4

13. Speakers suggested that ICTs can be used through educational policy, integrated transformative pedagogies, and sub-regional and international organizations to support the achievement of SDG4.
14. Speakers emphasized that technology can be used to advance inclusion and equity in education (i.e. assistive technology, mobile technology, OERs, open and distance learning).

Main challenges for developing, adopting, disseminating or scaling STI solutions and the knowledge, research and implementation gaps

15. Speakers pointed out that the challenges in mainstreaming SDGs in curricula: resistance to change and rapid pace of technology change.
16. There is a lack of incentive for collaboration at national and international levels.

Key recommendations for action

The discussion produced the following key recommendations for action by governments, the United Nations system, civil society, the private sector, the scientific community and others:

17. The STI Forum should highlight the role and responsibility of educational institutions in promoting innovation in sustainable development, specifically in addressing climate change. A systematic, multidisciplinary, and collaborative approach must be used in education to prepare students to be actors of environmental, social, technological and economic transitions and have a positive impact on the SDGs.
18. The session on SDG 4 should shift in focus from access to education to quality education and should aim to produce concrete recommendations. There is need to develop curricula, build teacher capacity and accountability, increase technology support and shift to a learner-centred paradigm of education.
19. Mechanisms of technology sharing between countries and international networks should be leveraged. The differing use of technology between generations must be further examined at a policy level in order to re-skill and upskill older populations, enabling them to join the future workforce.
20. Progress in SDG 4 has the highest correlation with acceleration of Information through technology (ICT). Regional strategies for using ICT to achieve SDG 4 include: developing ICT in education policies; engaging sub-regional and international organizations; allocating resources to maximize ICT potential for formal, non-formal and informal sectors; developing competency standards for teachers; taking concrete measure to tackle the learning divide and monitoring progress of using ICT in Four Priority Areas.
21. Technologies used in indigenous communities that can be scaled up should be given greater access to capital in order to place value on traditional knowledge.

22. Key steps taken by government include: expansion of the three-tiered university system, increased use of technology in education, initiatives to support innovation and start-ups and skill development programs and certifications.
23. Collaboration Governments, universities, and companies must partner nationally and internationally to address challenges in sustainable development.

Session 2b : STI for Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels (SDG 16)

Moderator:

- Ms. Špela Stres, Director, Innovation and Technology Transfer Center for the Jozef Stefan Institute, Slovenia (10 Member Group)

Panelists:

- Ms. Sanyukta Samaddar, Adviser, *Sustainable Development Goals/ Rural Development/Governing Council Secretariat Divisions*, NITI Aayog, Government of India
- Dr. Paula Hidalgo-Sanchis, Manager Pulse Lab Kampala (UN Global Pulse)
- Ms. Yola Georgiadou, Professor, Department of Urban and Regional Planning and Geo-Information Management, University of Twente

24. Session 2b discussed the status of existing knowledge, explored the potential for how STI can further support the achievement of SDG16, and addressed the political implementation on indicators, goals and metrics. It also presented recommendations regarding the structure and context of a session to be held during the 2019 STI Forum and future actions.

Key issues and facts reported

25. Speakers highlighted that technology exists to adequately address human-based issues for all people, in any technological advancement there needs to be overall inclusivity of all groups, especially those who might otherwise be marginalized.
26. Speakers emphasized that it is important to adjust implementation for country or culture specific issues, but we must also achieve SDG 16 in the worldwide context.
27. Speakers pointed out that the delivery of public services is not always effective at reaching all people equitably in many parts of the world.
28. Speakers agreed that big data should be used for development applications, while it is questionable that whether the big data is moral and ethical. It is important to both develop responsible technology and promote an environment and policies that will enable the ethical use of big data.
29. Speakers noted that different types of privacy cultures exist on the scales of integration (from high to low) and regulation (high to low). Depending on what the privacy culture is, data can be a public good, common pool good, private good, or a club good.
30. Speakers reported that trade-offs exist between privacy and being able to make the best-informed decisions. Having little data privacy has the potential for exploitation but can also mean more information is available for use as a common good.

Most effective ways for STI to support the achievement of SDG 16

31. SDG 16 is both an enabler and an outcome of many of the other SDGs
32. Speakers suggested that beyond having well-designed technical solutions, justice-based institutions must be present to deliver these services and implement the technologies necessary to enable the SDGs
33. Science, technology, and innovation can assist in enabling more justice-based institutions through increasing transparency, accountability, and participation of diverse social groups.

Political implementation on indicators, goals and metrics for SDG 16

34. Speakers admitted that being able to quantify progress in SDG 16 is difficult in itself since there are so many factors which feed into it; however, it may be helpful to assess certain things which are imminently quantifiable such as health, education, etc, and then think about how those things impact the SDG in question.

Forum incorporation and major topics on STI for SDG 16

35. Speakers suggested that one of the ways for digital divide implementation is by considering what governments can access and use technology, and which ones will not. Discussing the role that public-private partnerships can play in bridging this new digital divide will be useful.

Key recommendations for action

36. Speakers highlighted that STI can be used to increase participation, transparency, accountability in governance processes.
37. Speakers emphasized that data must be collected and used in such a way that not only does it not harm people, but it helps protect and enable them. Before developing tools for data analysis or when using big data, it is better to ask a few ethical questions in advance, including: Who is using these tools, and for what? Is there informed consent? What regulatory and ethical frameworks are in place?

Session 2c: STI for promoting sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all (SDG 8)

Moderator:

- Dr. Anne-Christine Ritschkoff, Senior Advisor, VTT Technical Research Center of Finland Ltd., Finland (10 Member Group)

Panelists:

- Mr. Tristan Ace, Social Enterprise Lead, British Council
- Mr. Edward Lorenz, Professor, Universite Cote d'Azur, France
- Mr. Takaki Tsujimoto, Vice President, JETRO Bangkok
- Mr. Yuan Guangxia, Deputy Director of Exchange and Cooperation Division, on behalf of Mr. Wang Ruijun, former CSTD Chair, Head of Guangdong Science and Technology Department, China
- Mr. Shuvojit Banerjee, Macroeconomic Policy and Analysis Section, Macroeconomic Policy and Financing for Development Division

38. Session 2c discussed the status of existing knowledge, explored the potential for how STI can further support the achievement of SDG8, and addressed the political implementation on indicators, goals and metrics. It also presented recommendations regarding the structure and context of a session to be held during the 2019 STI Forum and future actions. It covers several economic themes that are strongly interlinked, including economic growth and employment/decent work.

Key Issues and facts reported

39. According to the UN Secretary-General's Sustainable Development Goals Report 2018, progress in SDG8 has been mixed recently. Globally, labor productivity has increased and the unemployment rate has decreased. However, more progress is needed to increase employment opportunities, especially for young people, reduce informal employment and labor market inequality (particularly in terms of the gender pay gap), promote safe and secure working environments, and improve access to financial services to ensure sustained and inclusive economic growth.
40. Speakers highlighted that Robot installations in manufacturing have been concentrated in highly traded and GVC intensive sectors (e.g. automotive, electronics) where trade is relatively concentrated and dominated by high-income countries and This has led to some reshoring of jobs and may make it more difficult for low and middle-cone countries (LMICs) to be competitive. This has raised fears over the impacts of new technologies on jobs, but there is no clear trend that uptake of robots has led to massive job loss.
41. Speakers emphasized that social entrepreneurship policies have the power to promote organizational business models that can achieve impact, where investment mobile capital to achieve SDGs. Business innovations help place social and environmental impact at the center, reduce gender gaps, increase innovation, and offer new organizational models.
42. Speakers reported that SDGs provide a framework for transforming global business by promoting innovation, building markets, creating value, and outlining common rules.
43. Speakers noted that cooperation and development of Science & Technology (S&T) has led to substantial growth (e.g. population, per capita GDP, R&D investment, etc.). Model of regional cooperation can help promote mutual management of S&T research funds, overcome the tax problems, facilitate access to high-value human resources, and design policies that foster an environment ripe for innovation.
44. Speakers pointed out that policies responding to issues of productivity and financial stability will determine whether technological change is a help or hindrance to development in a region. Employment generation is increasingly difficult, especially given the large share of informal sector workers whose livelihoods are threatened by new technologies. Despite the potential for financial inclusion, fintech challenges traditional monetary policies by lowering demand for cash, lacking regulation, and replacing fiat money. New technologies may be leading to premature deindustrialization, while digitization may offer opportunities to expand fiscal space and strengthen tax administration.

Most effective ways for STI to support the achievement of SDG 8

45. Technologies of the 4th industrial revolution need to promote inclusive development, for example through mobile money platforms (e.g. M-PESA), micro-credit (e.g. M-Shwari), digital integration of value chains via apps, green electrical infrastructure, etc.

46. Speakers suggested that innovation as in the adoption of new business models seeking not only profit but also social progress, such as social enterprises or inclusive business, can be an instrument for promoting inclusive development.

Main challenges for developing, adopting, disseminating or scaling these STI solutions

47. Speakers indicated to explore how we can create business and organizational structures that accelerate positive social and environmental impact of S&T.

Structure and organization of SDG8 in the STI Forum

48. Speakers recommended to cover many different potential topics that some suggestions are to focus on issues such as social protection, equal opportunity of employment, human resource development, amongst other key issues.

Key recommendations for action

49. Speakers emphasized that education and training systems need to better respond to skills needs and gaps, both technical (e.g. computing) and experiential (e.g. team work and critical thinking).

50. Speakers suggested that educational institutions and employers need to provide continuous lifelong education and training, while governments provide national-level system of unemployment protection accessible to all persons looking for work regardless of the nature or duration of their previous employment.

51. Speakers noted that governments should consider redistributive measures to mitigate the risks of technology-induced transitions that may increase inequality and unemployment.

52. Speakers suggested the international cooperation to harmonize national tax policies in the context of a growing digital economy.

53. Discussions should move beyond GDP to more diversified metrics that balance sustainable economies with planetary boundaries.

54. Speakers emphasized that there are needs to develop capabilities for expanding local and regional markets in relatively labour-intensive commodity based industries (e.g. food, paper, etc.) which are less GVC intensive, less automated and smaller in scale.

55. Speakers pointed out that social good should be created by integrating both economic performance with corporate social responsibility through marketable products and services that serve societal needs.

Session 2d: STI for taking action to combat climate change and its impacts. (SDG 13)

Moderator:

- Professor GUO Huadong, President, Chairman Institute of Remote Sensing and Digital Earth of the Chinese Academy of Sciences (CAS) China (10 Member Group)

Panelists:

- Dr. Abdesslem Rabhi, Principal Programme Manager, IGES Kansai Research Center, Japan (under consultation with IGES)
- Mr. Bert van der Plas, UNFCCC secretariat
- Mr Anis Zaman, Energy Division, ESCAP

56. Session 2c discussed the status of existing knowledge, explored the potential for how STI can further support the achievement of SDG4, and addressed the political implementation on indicators, goals and metrics. It also presented recommendations regarding the structure and context of a session to be held during the 2019 STI Forum and future actions.

Key Issues and facts reported

57. Speakers emphasized that the call for climate change action is increasingly urgent, as seen by the IPCC report and COP 24 in Poland. While STI will be necessary to achieve SDG 13, it is also important to consider climate impacts in regard to STI.
58. SDG 13 is a key enabler in addressing SDG 13 as interlinkages between the two will influence both energy supply and demand at national and international levels. However, there is a lack of institutional drivers in energy transition as it is a new context. Investment in the energy transition is necessary to drive climate change action, including phasing out of fossil fuel subsidies, investment in renewables and an increased carbon price.

Most effective ways that STI could support the achievement of the SDG 13

59. Speakers suggested that mechanisms to facilitate sharing technology, policy, financial solutions and resources for climate change action. Ex: Japan-India Technology Platform

Main knowledge and implementation

60. There is a lack of national systems of innovation in developing countries.

Structuring and organization of the STI Forum 2019.

61. Speakers discussed that there should be framed to produce concrete outcomes and recommendations and should engage a large group of stakeholders.

Key partners, stakeholders and communities to be involved in the STI Forum 2019

62. The SDG 13 session should engage academia and the private (both small and large companies) and public sectors.
63. Speakers listed specific stakeholder recommendations: GAFA

Key recommendations for action

The discussion produced the following key recommendations for action by governments, the United Nations system, civil society, the private sector, the scientific community and others:

64. The SDG 13 session should include academia and private and public sectors, specifically including small companies.
65. Speakers emphasized that successful technological innovation (as highlighted by IPCC) should include a sound national system of innovation, market push and pull factors, innovation beyond technology, inclusive and equitable engagement of stakeholders, and collaboration between stakeholders.
- Strengthening of the Current gaps exist in National Systems of innovation, increased sharing of knowledge and lessons learned, and the enhancement of public and private sector partnership in the R&D of climate technologies.
66. Speakers highlighted that different format for implementations.
- ground activities include market assessment/stakeholder identification, stakeholder matching, feasibility studies and dissemination and upscaling.

- an online knowledge sharing platform that includes technology, policy, finance and resources and provides opportunities for international partnership.
- synergy between all stakeholders through ground intervention, online platforms and systematic support and continuity is necessary for successful partnership to achieving SDG 13.

Session 2e: STI for reducing inequality within and among countries (SDG 10)

Moderator:

- Mr. Shantanu Mukherjee, Chief, Integrated Policy Analysis Branch, DSDG, DESA

Panelists:

- Dr. Susan Cozzens, Georgia Tech, USA
- Dr. Aliza Belman Inbal, Director of the Pears Program for Global Innovation, Jerusalem Institute for Policy Research
- Ms. Sharmilla Binti Mohamed Salleh, Acting CEO, Yayasan Inovasi Malaysia
- Ms. Marta Pérez Cusó, Technology and Innovation Section, Trade, Investment and Innovation Division, ESCAP

Key Issues and facts reported

67. Speakers emphasized that multiple types of inequalities exist in and between societies, including vertical inequalities (between the rich and the poor) and horizontal inequalities (between culturally defined groups, such as gender). Under the current paradigm of competition between countries, inequalities can worsen with the introduction of STIs, unless they are consciously designed and operated to address this.
68. Speakers highlighted that innovation as a driver of growth is possible with conscious design, but technological growth without conscious design may widen inequalities. The first wave of benefits of technological innovation usually benefits wealthy people first.
 - Product and business innovation must occur in parallel - technologies will not be enough to address problems that exist.
 - More linkage needs to happen between the people who are developing technologies and those who have knowledge necessary to make those succeed.

Most effective ways that STI could support the achievement of SDG 10

69. Speakers suggested that technology transfer and local innovations are essential to reducing inequalities within and among nations. Knowledge-sharing, is essential, both within and outside formalized education systems.
70. Speakers emphasized the need to focus on both the young and the existing labor force. Tech has made it possible to build more accessible knowledge platforms that reduce language barriers and the need for formalized education (e.g. Google translate, Youtube, etc.). It is important to equitably: 1) further enrich content so those that need can use it, and 2) enable people to access content.
71. Technology is crucial for progress, but often inequality is the consequence of progress if the technology has not been carefully designed.

72. It is important to capture different components and dimensions of STI when considering how STI can help to address inequalities. Examples of these dimensions include R&D processes, institutional systems, policy, investments, and the role of the private sector.
73. Science, technology and Innovation to reduce inequality requires:
- Recognizing that the development of technologies in certain sectors (e.g. health, water) that more acutely impact the poor, may require government support as there may not be sufficient market incentives for the private sector.
 - Mainstreaming the inclusive lens across STI policymaking (e.g. when allocating financial resources to research areas) and supporting specific strategies and programmes geared towards ensuring STI reduce inequalities (e.g. supporting women to take a full part in the study, design, and use of technologies).
 - It is important to understand that investment in all the life cycle of innovation is essential for reducing inequality. In this context, the private sector can assist by taking on some responsibility to develop talent amongst those that don't have access to the same levels of education.

Key recommendations for action

74. SDG 10 should be addressed in the STI Forum not only as a dedicated section, but the topic of reducing inequalities should be a mainstreamed dimension to be considered across other sections
75. Policy can help address this by giving financial support for new products rather than scaling ones that exist. Policy can also help provide avenues for pro-poor innovations and technologies where the market will not naturally address those issues.
76. Strategies to reduce inequality between countries include: building domestic STI capabilities, tech transfer from abroad, and STEM related education.
- Strategies to reduce inequality within countries include: promoting inclusive innovation, innovations for the poor and innovations *by* the poor, using technologies that address the social dimension.
 - Policies that explicitly address leaving no one behind in tech and innovation meet the three: accessibility, appropriateness, affordability, and incorporate inclusion prior to, during, and after implementation.
77. Grassroots innovation can be employed to help reduce inequalities. There are opportunities to both mainstream grassroots innovations, and for the private sector as well as governments to support this type of innovation.
- Pathways to mainstreaming grassroots innovation include: coaching and training, innovation and development, and marketing and promotion.

Session 3: Promoting synergies with indigenous knowledge for the achievement of the SDGs

Moderator:

- Dr. Paulo Gadelha, former President, Oswaldo Cruz Foundation (Fiocruz), Brazil (10 Member Group)

Panelists:

- Ms. Sharmilla Binti Mohamed Salleh, Acting CEO, Yayasan Inovasi Malaysia

- Dr. Anamika Dey, Honey Bee Network, India
- Ms. Minnie Degawan, Director, Indigenous and traditional peoples programme, Conservation International, Washington DC (Philippines)
- Dr. Bartłomiej Kolodziejczyk, Chief Technology Officer, H2sG Energy, Singapore/Australia

Discussant:

- Ms. Marta Perez Cuso, Economic Affairs Officer, Technology and Innovation Section (ESCAP)

Key Issue and facts reported

78. Speakers and participants emphasize the technological inertia. The support for grassroots innovation requires to distinguish between indigenous knowledge and grassroots and frugal innovation, which are related but distinct. In addition, technology should be gender-sensitive because design that works well for male users may not be effective or appealing for women users. Women-based innovation enterprises is a way to overcome this problem.
79. Speakers highlighted that the rising income disparity among the have and have-nots, conversion of the ideas and innovations of knowledge-rich but economically-poor individuals and communities into viable means of raising income, addressing social needs, and conserving the environment is needed
80. Speakers reported the scientists in residence. Scientists in universities match local government needs for high schools and indigenous communities.
81. Speakers pointed out that emergence location specific solution which may not diffuse to wider market and remain in niche markets. But the problems are worth solving. Similarly, innovations for tasks that women do remain neglected.

Key recommendations for action

82. Speaker and participants suggested to provide space during the STI forum to explore how to harness indigenous and traditional knowledge.
83. Each public sector lab should be mandated to test and give free reports to grassroots innovators and TK holders, or a national fund for the purpose be created to compensate the labs.
84. Participants recommended that prior Informed Consent of Knowledge provider, protecting their rights vs open innovation platforms is most important.
85. Without testing and validation, it is hardly to decide to invest in value addition and thus a fund to add value through a network of designers, workshops, labs, colleges, is needed to make inclusive innovations ready for social or market-based diffusion.
86. Testing norms and Fatigue factors to legitimize scrap industry. Without testing, certification will not be done and without certification, access to financial institutions and credits is not possible.
87. In order to ensure the sustainability of the STI for SDGs, the impactful program for longer period is needed. The signature program must be in place for 3 – 5 years. The government must continue support and allocate sufficient funding for the development of the knowledge/ innovations.

- It is important to have a platform to synergize the gap between indigenous/grassroots innovations with innovation at the mainstream.
- Knowledge sharing from indigenous people and scientists.
- UN should encourage the support from the government to learn the science knowledge from indigenous people to advance the implementation of SDGs
- One voice from all the stakeholders (main players) to support the initiative

Session 4: Emerging technology clusters and the impact of rapid technology change on the SDGs

Moderator:

- Dr. José Ramón López-Portillo Romano, Chairman/non-Executive Director, Zenith Energy Ltd, Mexico (10 Member Group)

Panelists:

- Dr. Bartłomiej Kolodziejczyk, Chief Technology Officer, H2sG Energy, Singapore/Australia
- Dr. Khalisah Zulkefli, Department of Biological Sciences, Sunway University, Malaysia
- Mr. Chung Song, Chief Director, Division of Global Innovation Strategy of the Science and Technology Policy Institute, Republic of Korea
- Dr. Gong Ke, President Elect, World Federation of Engineering Organization; President of Nankai University, China

Discussants:

- Mr. Donovan Guttieres, MIT Center for Biomedical Innovation; UN Major Group for Children & Youth
- Ms. Arisa Ema, Project Assistant Professor, Policy Alternatives Research Institute, The University of Tokyo, Japan
- Mr. Sameer Sharma, Senior Advisor, ITU, Regional Office for Asia-Pacific, Bangkok
- Mr. Clovis Freire, UNCTAD
- Mr. Richard A Roehrl, DESA

Session 4 discussed emerging technologies and their impact on the achievement of the SDGs, as well as desirable policy responses. Various emerging technology clusters such as AI, biotechnology, and nanotechnology will be discussed.

Key Issues and facts reports

88. Speakers highlighted that emerging technologies will affect technology roadmaps moving forward. Developing countries need to find ways to use new technologies to leapfrog, harnessing their potential while minimize the risks. Benefits must be socialized.
89. Speakers reported that resent case study of new technology cluster that makes use of hydrogen as a clean energy source and other processes (e.g. agriculture), potentially to replace methane and lead to more renewable alternatives.

90. Speakers mentioned that present case study of new technology cluster making use of CRISPR and gene drives to edit the human genome to avoid genetic diseases, improve crop resilience, and more. Do-it-yourself biology may lead to innovative ways to access and use technologies but need comprehensive assessment of potential risks and benefits.
91. Speakers emphasized that exponential rise in computing power and AI is an opportunity to find solutions to long-term sustainable development issues, but bottlenecks need to be addressed: data dependence, non-transferability, energy use, semantic gaps, and reliability. Need to strengthen social principle of human centred AI: dignity, diversity and inclusion must be central.
92. Speakers and participants agreed that innovations are transforming the digital economy, with potential to help meet SDGs (e.g. use of drones in Ebola tracking, AI for Good). National policies and guidelines are needed to promote use of ICTs that are in the public interest, while promoting cross-sector collaboration and enabling innovation.
93. Participants noted that while new clusters are emerging, there are emerging combinations of clusters. Need to leverage STI in ways that avoid new inequalities and reducing existing ones. Many countries lack capacity to have foresight into the impacts of emerging technologies on society and the environment, guidelines from the UN can be helpful.

Opportunities and risks for accelerated technology change towards the SDGs

94. As with all technologies, tradeoffs exist and the design, deployment, and use of technologies must be considered through an integrated social, environmental and economic lens.

New and disruptive technology clusters for reaching the SDGs

95. Digital technologies, big data, cyber-physical systems, synthetic biology, nanotechnology, hydrogen technology, etc. as well as integrated technology clusters.

Results in the Technology Facilitation mechanism

96. 39 policy reviews/reports received from the survey circulated, leading to a report by UN DESA and UNCTAD, with continued work by both agencies.

Best preparation for the technology changes

97. Need to consider societal components of new technologies and their relationships with human values.
98. Need a new set of social policies and governance mechanisms to address rapid technological change and disruption, as technology alone will not be alone.
99. Making inclusion a key part of any S&T strategy.
100. Use of indicators to connect local and indigenous peoples, as well as other stakeholders in society, to these broader ideas and discussions.
101. New technologies need to be demand and goal driven, with large scale monitoring.
102. Public engagement of scientific communities and coordination with social sciences is key, including coordination of ethical committees within different organizations.

Structure and organization of a STI Forum session on emerging technology clusters and the impact of rapid technology change

103. Participants suggested that the Forum may demonstrate the comparative advantage and value-addition of convening a dialogue at the UN as part of the STI Forum and work of the TFM.
104. At the upcoming STI Forum, there could be a call for proposals from different stakeholders to pilot activities, especially within specific clusters, to make the discussion more concrete and lead to action.

Key recommendations for action

105. Call for consensus on AI design principles and technical standard, both at national and international levels to ensure the responsible conduct of AI and its governance, such as data and privacy rights, abuse of and monopolization of asymmetric information power, prejudices, and marginalization.
106. Gender equality in educational programs and technology development needs to continue being emphasized and improved upon.
107. Technology justice as core to development justice, focus on innovating the delivery of proven sustainable technologies rather than delivering new innovations. Evaluate social, legal, and environmental impacts of technologies, through a global technology assessment mechanism that goes beyond measures of economic ROI.
108. Past experience with export led economic growth and sees industrialization of STI as a gateway towards progress on SDGs.
 - Incentive investments in STI infrastructure (e.g. technology parks), human resources (e.g. scholarships), media (e.g. demonstrate social value of scientists and engineers).
 - Emerging technology clusters are leading to new types of capital and economies.
109. Discovery lab might be useful to allow innovators to understand what is happening at the technology frontier and for citizens to learn about their potential implications.

Session 5: Taking stock and lessons-learnt from the start-up phase of the TFM since 2015

Moderator:

- Dr. Paulo Gadelha, former President, Oswaldo Cruz Foundation (Fiocruz), Brazil (10 Member Group)

Introductory presentation:

- Mr. Richard A Roehrl, Senior Economic Affairs Officer, Division for Sustainable Development Goals, DESA

Panelists:

- Dr. Anne-Christine Ritschkoff, Senior Advisor, VTT Technical Research Center of Finland Ltd., Finland
- Dr. José Ramón López-Portillo Romano, Chairman/non-Executive Director, Zenith Energy Ltd, Mexico
- Dr. Gong Ke, President Elect, World Federation of Engineering Organization; President of Nankai University, China

- Prof. Tateo Arimoto, Professor of GRIPS and Principal Fellow of the Japan Science and Technology Agency (JST)

Discussant:

- H.E. Mrs. Marie Chatardová, Ambassador Extraordinary and Plenipotentiary, Permanent Representative of the Czech Republic, former the President of ECOSOC

Key Issues and facts reported

110. Speakers and participants emphasized that the United Nations need to highlight the importance of science for the implementation of the SDGs, as new technologies can provide evidence and solutions to social, economic and environmental issues pertaining to the SDGs.
111. Speakers highlighted that STI has become more preminent in the SDGs discussions, and while still very fragmented, the UN system has created some bodies of coordination. However, while coordination is happening at the working level, to achieve actual changes in the ground it is necessary to have a more systemic approach, with an institutional architecture that is less fragmented, better funded and more engaged with different stakeholders.
112. Speakers noted that increased level of uncertainty demands are more resilience and adaptability nowadays. Furthermore, technology evolves rapidly, and while they can provide new solutions it is crucial to think about the new challenges they will bring.
113. Speakers pointed out that technological progress grows exponentially, and such rapid changes indicate a future that will most likely be unrecognizable. However, institutions, ideas and policymaking move much slower, and particularly developing nations are at risk of being left behind if they are not able to keep up with changes.
114. Speakers and participants agreed that engineers are essential for sustainable development and good engineering will be key to achieve the SDGs. The WFEO has integrated sustainability principles in its “Model Code of Practice” to suggest good practices for engineers.

Main lessons learnt from the start-up phase of the UN Technology Facilitation Mechanism (2015 to 2019 and the implications of the socio-technical and socio-economic changes since 2015

115. The TFM is still limited in what it can achieve due to lack of resources, short time for engagements (e.g. The STI Forum is only 2 days) and lack of coordination between the multiple activities. There is a lack of trust among some stakeholders which reflects in difficulties in cooperation and communication.
116. Developed and developing countries have different needs, therefore it is hard to establish one size fits all recommendations. It is important to adjust the solutions and learn from different experiences.
117. It is important to have collaboration and integration among the many activities related to the workstreams of the TFM which are currently being conducted in isolation.
118. The SDGs are related to issues situated between the intersection of science and policymaking. To address them, it is necessary to adopt a ‘trans-science’ type of approach connecting multidisciplinary groups of scientists and experts with policymakers.

Recommendations for the TFM until 2023 and systematic TFM engagement with stakeholders and other mechanisms

119. Speakers encouraged to enhance engagement and collaboration with different stakeholders, such as scientists, youth groups, policymakers and private sector by connecting relevant STI networks.
120. Speakers emphasized the importance to highlight the visibility of STI and its potential for the SDGs. Spread the discussion beyond the STI Forum to reach national policymakers and other stakeholders.
121. It is necessary to establish an online platform that can provide public and private sectors with information such as technologies available to address particular issues and relative costs. This will require establishing metrics indicators and plans that include all relevant stakeholders.
122. It is noted to develop roadmaps following a more action-oriented strategy and considering outputs and deliverables from the TFM.
123. Participants suggested to organize the STI Forum with less panellists but select more engaging speakers and allow more time for discussions.
124. Treat the work of the STI Forum as an all-year, ongoing participatory project.
125. It is important to be ambitious but also set realistic goal that can be achieve with small steps. The TFM has achieved some success but it is still limited by the lack of resources and deficiencies in coordination, cooperation and communication among stakeholders.

Key recommendations for action

126. The United Nations should organize networking events to connect different stakeholders.
127. The visibility of STI could be improved by organizing a side-event at the HLPF where the high level of member states can network and become more aware for STI topics.
128. The STI Forum should have a media zone (similar to that of the Youth Forum), more engagement online and potentially some celebrity power to increase visibility.
129. To appoint a focal point responsible for STI in the Secretary General's office.
130. The 10 Members Group would benefit from changing its members tenure time to 4 years.

Session 6: STI roadmaps incorporating SDGs and their implications for policy and capacity building

Moderator:

- Dr. Michiharu Nakamura, Senior Advisor (Former President), Japan Science and Technology Agency (10 Member Group)

Introductory presentation and IATT subgroup's work:

- Mr. Naoto Kanehira, Senior Private Sector Specialist, the World Bank Group

Panelists:

- Mr. Tom Peter Migun Ogada, Executive Director, African Center for Technology Studies (ACTS) and Chairperson, Kenyan National Commission for Science, Technology and Innovation (NACOSTI)
- Mr. Dietrich Van der Weken, General Manager, Global Sustainable Technology and Innovation Conference (VITO/GSTIC)

- Mr. Has Bunton, Secretary General National Science and Technology, Ministry of Planning of Cambodia
- Ms. Monika Matusiak, Directorate General Joint Research Centre (JRC), European Commission, Directorate B – Growth and Innovation, Smart Specialisation Platform
- Mr. Jonathan Tsuen Yip Wong, Chief of Technology and Innovation, the Trade, Investment, and Innovation Division, ESCAP

Discussants:

- Mr. Ludovico Alcorta, Professorial Fellow on "Technology, Innovation and Sustainable Development" at UNU MERIT, School of Business and Economics, University of Maastricht, The Netherlands
- Mr. Wei Liu, Coordinator, UN Inter-agency Task Team on Science, Technology and Innovation for the SDGs, DSDG/DESA

131. Session 6 discussed the latest version of the guidebook on building STI roadmaps for SDGs as a policy-making and communication tool for Member States. It also reviewed a proposed global pilot programme on STI roadmaps in order to build capacity for and scale up adoption of the Member States' STI roadmaps for the SDGs. All participants presented the recommendations on how structure and organize a discussion on that topic during the STI Forum.

Key Issues and facts reported

132. Speakers and participants highlighted that STI for SDGs roadmaps should provide tools for coherent multi-stakeholders' engagement to attain the SDGs while establishing evaluation and feedback systems with living/learning processes and incorporating social, economic and technological action plans.
133. Speakers emphasized that STI roadmaps should be adapted to each national framework. Nonetheless, while each country will have its unique needs and strategies, a realistic STI roadmap for SDGs should observe the commonalities that are bound to exist.
134. Kenya and Cambodia are two candidates for Global Pilot Programme.
- Kenya's STI policy and its SDGs roadmap strategy are being implemented by different ministries. The pilot project would support the country in the development of an integrated STI plan to implement the SDG roadmaps.
 - A STI roadmap should provide Cambodia with guidelines to address its beginner's challenges, such as what industries should be prioritized, what returns of investment to expected and who should finance it, among others.
135. Global Sustainable Technology & Innovation Conference (G-STIC) connects technological innovation to decision making for sustainability by raising awareness of these solutions within government, civil society, research, private sector, non-profit and multilateral organizations. It has developed 25 tables so far that provide strategies to address policy challenges.
136. Smart Specialization combines evidence-based and community-based knowledge and set transformative agendas relying on localization, customization, prioritization and mobilization.

Lesson Learnt from roadmaps

137. Effective roadmaps require countries to establish a coherent national framework for STI by harmonizing the policies of different but related ministries. This translates into a common language that will facilitate the engagement with other stakeholders such as academia and private sector.
138. Smart Specialization strategies have been effective because they are scalable, with a flexible framework, supportive structures, international partnerships and also promote innovation in policy-making.
139. While traditional STI policy focuses on R&D, STEM fields, etc; A STI for SDGs roadmap needs to reflect a modern, mission-driven approach, engaging incubators, accelerators and grassroots, promoting impact investment and social entrepreneurship, and support inclusiveness.
140. The implementation of 4th industrial revolution technologies must be accompanied with considerations on their ethical implications and effects on society.
141. A STI roadmap to SDGs will require a next generation STI policy framework which integrates economic, social and environmental factors, leaves no one behind and is time bound.
142. Capacity building is important to STI roadmaps as it simplifies data concepts and standardizes the language, allowing experiences to be described following a commonly understood framework. It is also fundamental in addressing the needs and implications of new technologies and connect the STI roadmaps with actual policy implementation.

Global Pilot Programme for STI for SDGs Roadmaps

143. A total of 19 countries expressed interest in joining the Pilot Program, while 11 submitted the required document by the Feb 2019 deadline. The announcement of the chosen countries is schedule to Mar/Apr 2019.
144. The current capacity building for STI activities need to demystify and incorporate the SDGs into STI roadmaps and address the methods of actual policy application.
145. The Global Pilot Programme on STI for the SDGs roadmaps will be an opportunity to test the draft guidebook, build capacity of the selected member states, promote good practices, and analyse the gaps. It will prioritize developing countries and those actively engaging UN agencies regarding STI roadmaps.
146. In addition to the 19 countries, the following countries, the Kingdom of Norway, the Republic of Korea and the United Republic of Tanzania, have expressed their interests to join the Global Pilot Programme during the meeting. As follow-ups, they immediately worked closely with the Secretariat for further engagement and for nominating country focal points.

Recommendations for STI Forum on the roadmaps

- It is important that the efforts go beyond creating more documents but be applied in actual projects, particularly by starting with pre-existing ones.

Session 7: Gender and STI for SDGs

Moderator:

- Dr. Agnes Lawrence Kijazi (United Republic of Tanzania), Director General, Tanzania Meteorological Agency (TMA) (10 Member Group co-chair)

Panelists:

- Ms. Maria Theresa Mateo, Managing Director, CX Catalysts
- Dr. Anthony C. Sales, Regional Director, Department of Science and Technology (DOST), The Philippines
- Ms. Araba Sey, Principal Research Fellow, UNU-CS

Discussant:

- Ms. Julia Milton, Technology Focal Point (UN MGCY) and Human Systems Laboratory (MIT)

147. Session 7 discussed the main STI related challenges for women and girls and gender equality as well as existing and potential solutions to these challenges. Discussions led the development of a gender sensitive program for the STI Forum and gender sensitive outcome.

Key Issues and Facts reported

148. Speakers and participants highlighted that there are significant inroads for gender mainstreaming and addressing disparities in the workplace and other spheres. These directives must be channeled at a global and national level to create concrete action.
149. Speakers pointed out that the number of women in the STEM workforce is significantly lower than the number of women in STEM education. This drop can be attributed in part to workplace environment, lack of women in leadership and societal view of women in STEM. The cultural and structural barriers that perpetuate gender gaps in STI must be examined, especially at an institutional level, in order to understand complex trends in the continued under-representation of women in STEM.
150. Speakers and participants emphasized that risks emerge from viewing technological systems as unbiased, as they are inherently affected by the bias of the humans that designed it, resulting in discriminatory design.

Main STI related challenges and solutions for women and girls and gender equality

151. Challenges and opportunities for gender-responsiveness in STI/STEM fields
- A lack of disaggregated gender data in SDG indicators and gender specific data in STI and SDGs.
 - Women are less likely to join STEM field and more likely to leave due isolation, hostile male-dominated work environments, etc., despite an increasing number of women in STEM education. This results in a lack of women in STEM leadership.
152. Policy measures and good practices to attract and retain women and girls, achieve gender parity and fully leverage women and girls' potential
- Creation of targeted gender-responsive programs and projects (i.e. Magna Carta of Women, Program on Women in Science, She for We, Gender Mainstreaming Evaluation Framework)
 - Tools to measure the extent of gender mainstreaming at organizational and national levels, in order to pinpoint areas for improvement.

153. Private industry controls a large amount of capital and governments must leverage their influence in order to impact industry to achieve sustainable development.

- Achieving SDG 1-10 by 2030 will take nearly 3 planets (Transformation is Feasible Report). Focus is need on renewable energy growth, productivity in food chains, new development models in developing countries, inequality reduction and investment in education, gender equality, family planning and health.

Key recommendations for action

The discussion produced the following key recommendations for action by governments, the United Nations system, civil society, the private sector, the scientific community and others:

- The STI Forum should include 50% women on all panels and all sessions and outcomes should include a gender lens.
- The increase of women in STI will accelerate the achievement of the SDGs through a diversity of thought and perspective and will act as multipliers in success.
- Enhanced cooperation among initiatives to close gender digital gaps, such as through EQUALS Global Partnership

2019 STI Forum Volunteers

SDG 4	volunteer	topic/suggestions	position
	Gong Ke	engineering education qualifications	President Elect, World Federation of Engineering Organization; President of Nankai University,
	Marianne Mensah	digitalization of teaching/ virtual side events	International Executive Director, Universite Cote d'Azur, France
	Tess Mateo	+ 3 multinationals	Managing Director, CXCatalysts
	Donovan Gueterres	integenerational approaches to lifelong learning	MGCY
SDG 8	Monika Matusiak	smart specialization, overview of good practices + speakers	Diretorate General Joint Research Centre (JRC), European Commission, Directorate B – Growth and Innovation, Smart Specialisation Platform
	?	gender perspective	
SDG 10	LDC tech bank	?	
	Dr. Aliza Belman Inbal	market failures	Director of the Pears Program for Global Innovation, Jerusalem Institute for Policy Research
	Donovan Gueterres	human rights framework	MGCY
SDG 13	Bert van der Plas	speakers	UNFCCC secretariat
	Huadong Guo	Big Earch data, study paper	
	Gong Ke	capacity building for SIDS	
	Ms. Sharmilla Binti Mohamed Salleh	India	Acting CEO, Yayasan Inovasi Malaysia
	Dr. Anamika Dey		Honey Bee Network
	LDC tech bank		
SDG 16	Gong Ke	compliance	
Roadmaps	Ms. Monika Matusiak		
	Paulo		
	Jose Ramon		

	Dr. Aliza Belman Inbal		
	?		
	LDC tech bank		
Emerging technologies	Jose Ramon	GA resolutions on impact of rapid technology change	
Indigenous Knowledge	UNMGCY		
	Paulo		
	Martha		ESCAP
	Myrna Cuningham		
Gender	UNMGCY		
	Ms. Araba Sey		Principal Research Fellow, UNU-CS
	?		
Capacity building	Ludo, Naoto, LDC tech bank, Gong Ke, Huadong Guo		
Exhibition	Dietrich?		
	Donovan		
	Aliza		
	Monika		
Call for Innovations	UNMGCY		
	Dr. Anthony C. Sales		Regional Director, Department of Science and Technology (DOST), The Philippines
	Li Zhou		Escap
	Paulo	integrate with speakers	
Matchmaking app			
Outreach	Naoto	viodeo version	
Distant involvement			

Programme

Day One	
9:15 – 9:30	<i>Welcome coffee</i>
9:30 – 10:00	<p>Welcome remarks</p> <ul style="list-style-type: none"> ● Mr. Jonathan Tsuen Yip Wong, Chief of Technology and Innovation on behalf of Mr. Hongjoo Hahm, Deputy Executive Secretary, UNESCAP <p>Remarks by the co-chairs of the STI Forum</p> <ul style="list-style-type: none"> ● H.E. Mrs. Elizabeth Thompson, Ambassador Extraordinary and Plenipotentiary, Permanent Representative of Barbados, co-chair of the STI Forum ● H.E. Mrs. Marie Chatardová, Ambassador Extraordinary and Plenipotentiary, Permanent Representative of the Czech Republic, former the President of ECOSOC, co-chair of the STI Forum <p>Remarks by co-chairs of the 10_Member Group of high-level representatives</p> <ul style="list-style-type: none"> ● Dr. Agnes Lawrence Kijazi (United Republic of Tanzania), Director General, Tanzania Meteorological Agency (TMA)
Group photo (10:00 – 10:20)	
10:20 – 10:45	<p><u>Session 1: Introduction to Workshop</u></p> <p>Introductory presentation:</p> <ul style="list-style-type: none"> ● Mr. Shantanu Mukherjee, Chief, Integrated Policy Analysis Branch, DSDG, DESA ● Mr. Clovis Freire, Division for Technology and Logistics, UNCTAD ● Dr. Jong Soo Yoon, Head of UNOSD
10:45 – 11:00	<i>Coffee Break</i>
	<p><u>Session 2: STI challenges and solutions for the selected SDGs</u></p> <p><i>Sessions 2a to e address key challenges and potential STI solutions for SDGs 4, 8, 10, 13, and 16. These goals will be a focus of the agenda of the High-level Political Forum on Sustainable Development in 2019. The sessions will be held in parallel. They will be organized in the form of interactive panels followed by Q&A and moderated discussions.</i></p> <p><u>Guiding questions for sessions 2a to e:</u></p> <ul style="list-style-type: none"> ● What are the most effective ways for science, technology and innovation to support the achievement of SDGs 4, 8, 10, 13, and 16? ● What are the main challenges for developing, adopting, disseminating or scaling these solutions? What are the knowledge, research and implementation gaps? ● How to structure and organize respective sessions in the STI Forum? ● What are desirable action-oriented and scientifically sound outcomes and recommendations for the STI Forum to consider?

	<ul style="list-style-type: none"> • Which partners, stakeholders and communities could be mobilised for the STI Forum?
11:00 – 12:30	<p><u>Session 2a: STI for ensuring inclusive and equitable quality education and promote lifelong learning opportunities for all (SDG 4)</u> <i>(Breakout session)</i></p> <p>Moderator: Dr. Agnes Lawrence Kijazi (United Republic of Tanzania), Director General, Tanzania Meteorological Agency (TMA) (10 Member Group – co-chair)</p> <ul style="list-style-type: none"> • Mr. Manpreet S. Manna, Director, Administration & Swayam, All India Council for Technical Education, Ministry of Human Resources Development, India • Ms. Jonghwi Park, UNESCO Asia Pacific Regional Bureau for Education • Ms. Marianne Mensah, International Executive Director, Universite Cote d’Azur, France <p>Discussant:</p> <ul style="list-style-type: none"> • H.E. Mrs. Elizabeth Thompson, Ambassador Extraordinary and Plenipotentiary, Permanent Representative of Barbados, co-chair of the STI Forum
11:00 – 12:30	<p><u>Session 2b: STI for Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels (SDG 16)</u> <i>(breakout session)</i></p> <p>Moderator: Ms. Špela Stres, Director, Innovation and Technology Transfer Center for the Jozef Stefan Institute, Slovenia (10 Member Group)</p> <p>Panelists:</p> <ul style="list-style-type: none"> • Ms. Sanyukta Samaddar, Adviser, <i>Sustainable Development Goals/ Rural Development/Governing Council Secretariat Divisions</i>, NITI Aayog, Government of India • Dr. Paula Hidalgo-Sanchis, Manager Pulse Lab Kampala (UN Global Pulse) • Ms. Yola Georgiadou, Professor, Department of Urban and Regional Planning and Geo-Information Management, University of Twente
12:30 – 14:00	<i>Lunch break</i>
14:00 – 15:30	<p><u>Session 2c: STI for promoting sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all (SDG 8)</u> <i>(Breakout session)</i></p> <p>Moderator: Dr. Anne-Christine Ritschkoff, Senior Advisor, VTT Technical Research Center of Finland Ltd., Finland (10 Member Group)</p> <p>Panelists:</p> <ul style="list-style-type: none"> • Mr. Tristan Ace, Social Enterprise Lead, British Council • Mr. Edward Lorenz, Professor, Universite Cote d’Azur, France

	<ul style="list-style-type: none"> ● Mr. Takaki Tsujimoto, Vice President, JETRO Bangkok ● Mr. Yuan Guangxia, Deputy Director of Exchange and Cooperation Division, on behalf of Mr. Wang Ruijun, former CSTD Chair, Head of Guangdong Science and Technology Department, China ● Mr. Shuvojit Banerjee, Macroeconomic Policy and Analysis Section, Macroeconomic Policy and Financing for Development Division
14:00 – 15:30	<p><u>Session 2d: STI for taking action to combat climate change and its impacts. (SDG 13) (Breakout session)</u></p> <p>Moderator: Professor GUO Huadong, President, Chairman Institute of Remote Sensing and Digital Earth of the Chinese Academy of Sciences (CAS) China (10 Member Group)</p> <p>Panelists:</p> <ul style="list-style-type: none"> ● Dr. Abdessalem Rabhi, Principal Programme Manager, IGES Kansai Research Center, Japan (under consultation with IGES) ● Mr. Bert van der Plas, UNFCCC secretariat. ● Mr Anis Zaman, Energy Division, ESCAP <p><u>Guiding questions:</u></p> <ul style="list-style-type: none"> ● Which STI approaches, actions or policies have proven successful in accelerating clean energy innovation to address climate change? ● What are the main knowledge and implementation gaps that call for more research and technology development? How could these gaps best be addressed at national and local levels? ● How to structure and organize a session on SDG13 in the STI Forum to facilitate discussion and the identification of relevant recommendations? Which speakers and key stakeholders would you recommend to participate in this session? What should be the desirable deliverables? ● What would be your three key recommendations for policy and concrete action?
15:30 – 15:45	<i>Coffee Break</i>
15:45 – 17:00	<p><u>Session 2e: STI for reducing inequality within and among countries (SDG 10) (plenary session)</u></p> <p>Moderator: Mr. Shantanu Mukherjee, Chief, Integrated Policy Analysis Branch, DSDG, DESA</p> <p>Panelists:</p> <ul style="list-style-type: none"> ● Dr. Susan Cozzens, Georgia Tech, USA ● Dr. Aliza Belman Inbal, Director of the Pears Program for Global Innovation, Jerusalem Institute for Policy Research ● Ms. Sharmilla Binti Mohamed Salleh, Acting CEO, Yayasan Inovasi Malaysia ● Ms. Marta Pérez Cusó, Technology and Innovation Section, Trade,

	Investment and Innovation Division, ESCAP
--	---

Day Two	
8:30 - 9:30	<p>Closed meeting of the 10 Member Group and informal exchanges with the co-chairs of the STI Forum</p> <ul style="list-style-type: none"> - Expectations and potential contributions to the 2019 STI Forum - Elements of STI Forum Program
9:30 – 10:45	<p><u>Session 3: Promoting synergies with indigenous knowledge for the achievement of the SDGs</u></p> <p><i>This session will discuss how to harness indigenous and traditional knowledge relevant to the achievement of the SDGs. It will also present recommendations on how better highlight and mainstream the role of indigenous knowledge in the STI Forum.</i></p> <p>Moderator: Dr. Paulo Gadelha, former President, Oswaldo Cruz Foundation (Fiocruz), Brazil (10 Member Group)</p> <p>Panelists:</p> <ul style="list-style-type: none"> ● Ms. Sharmilla Binti Mohamed Salleh, Acting CEO, Yayasan Inovasi Malaysia ● Dr. Anamika Dey, Honey Bee Network, India ● Ms. Minnie Degawan, Director, Indigenous and traditional peoples programme, Conservation International, Washington DC (Philippines) ● Dr. Bartlomiej Kolodziejczyk, Chief Technology Officer, H2sG Energy, Singapore/Australia <p>Discussant:</p> <ul style="list-style-type: none"> ● Ms. Marta Perez Cuso, Economic Affairs Officer, Technology and Innovation Section (ESCAP) <p><u>Guiding questions:</u></p> <ul style="list-style-type: none"> ● How to create synergies with indigenous knowledge and grassroots technologies for achieving the selected SDGs? ● How to ensure that STI for SDGs leaves no one behind? ● How to structure and organize a session on creating synergies with indigenous knowledge for achieving the SDGs during the STI Forum to facilitate discussion and identification of relevant recommendations?
10:45 – 11:00	<i>Coffee Break</i>
11:00 – 12:45	<p><u>Session 4: Emerging technology clusters and the impact of rapid technology change on the SDGs</u></p>

	<p><i>This session will discuss emerging technologies and initial findings on their impact on the SDGs. It will also present recommendations on how to structure and organize a discussion on that topic during the STI Forum. Various emerging technologies such as AI, biotechnology, nanotechnology, etc. can be discussed.</i></p> <p>Moderator: Dr. José Ramón López-Portillo Romano, Chairman/non-Executive Director Zenith Energy Ltd, Mexico (10 Member Group)</p> <p>Panelists:</p> <ul style="list-style-type: none"> ● Dr. Bartłomiej Kolodziejczyk, Chief Technology Officer, H2sG Energy, Singapore/Australia ● Dr. Khalisah Zulkefli, Department of Biological Sciences, Sunway University, Malaysia ● Mr. Chiung Song, Chief Director, Division of Global Innovation Strategy of the Science and Technology Policy Institute, Republic of Korea ● Dr. Gong Ke, President Elect, World Federation of Engineering Organization; President of Nankai University, China <p>Discussants:</p> <ul style="list-style-type: none"> ● Mr. Donovan Guttieres, MIT Center for Biomedical Innovation; UN Major Group for Children & Youth ● Ms. Arisa Ema, Project Assistant Professor, Policy Alternatives Research Institute, The University of Tokyo, Japan ● Mr. Sameer Sharma, Senior Advisor, ITU, Regional Office for Asia-Pacific, Bangkok ● Mr. Clovis Freire, UNCTAD ● Mr. Richard A Roehrl, DESA <p><u>Guiding questions:</u></p> <ul style="list-style-type: none"> ● What opportunities and risks does recent accelerated technology change have for developing and developed countries? How would these transform the pathways toward the SDGs? ● Which new and disruptive technology clusters should be considered as transformative for reaching the SDGs as a whole? ● What have been the results and lessons-learned from work on this topic in the Technology Facilitation mechanism? ● How can countries best prepare for these changes? ● How to structure and organize a STI Forum session on emerging technology clusters and the impact of rapid technology change? Which speakers do you recommend for the respective session of the Forum? ● What are your three most important recommendations for policy and concrete action?
12:45 – 14:00	<i>Lunch break</i>
14:00 – 16:00	<p>Session 5: Taking stock and lessons-learned from the start-up phase of the TFM since 2015</p> <p><i>This session will informally take stock and identify key lessons-learned from the</i></p>

	<p><i>Technology Facilitation Mechanism (TFM) since its inception in 2015, in order to inform the UN discussions on the 2030 Agenda in 2019.</i></p> <p>Moderator: Dr. Paulo Gadelha, former President, Oswaldo Cruz Foundation (Fiocruz), Brazil (10 Member Group)</p> <p>Introductory presentation:</p> <ul style="list-style-type: none"> ● Mr. Richard A Roehrl, Senior Economic Affairs Officer, Division for Sustainable Development Goals, DESA <p>Panelists:</p> <ul style="list-style-type: none"> ● Dr. Anne-Christine Ritschkoff, Senior Advisor, VTT Technical Research Center of Finland Ltd., Finland ● Dr. José Ramón López-Portillo Romano, Chairman/non-Executive Director, Zenith Energy Ltd, Mexico ● Dr. Gong Ke, President Elect, World Federation of Engineering Organization; President of Nankai University, China ● Prof. Tateo Arimoto, Professor of GRIPS and Principal Fellow of the Japan Science and Technology Agency (JST) <p>Discussant: H.E. Mrs. Marie Chatardová, Ambassador Extraordinary and Plenipotentiary, Permanent Representative of the Czech Republic, former the President of ECOSOC</p> <p><u>Guiding questions:</u></p> <ul style="list-style-type: none"> ● In your view, what are the main lessons learnt from the start-up phase of the UN Technology Facilitation Mechanism (2015 to 2019)? What are the implications – if any – of the socio-technical and socio-economic changes since 2015? ● What are your recommendations on the way forward for the TFM until 2023? How could the TFM engage in a more systematic way with stakeholders and other mechanisms?
--	--

Day Three	
9:00 – 10:30	<p><u>Session 6: STI roadmaps incorporating SDGs and their implications for policy and capacity building</u></p> <p><i>The session will discuss the latest version of the guidebook on building STI roadmaps for SDGs as a policy-making and communication tool for Member States. It will also review a proposed global pilot programme on STI roadmaps in order to build capacity for and scale up adoption of the Member States' STI roadmaps for the SDGs. The session will discuss recommendations on how structure and organize a discussion on that topic during the STI Forum.</i></p> <p>Moderator: Dr. Michiharu Nakamura, Senior Advisor (Former President), Japan</p>

	<p>Science and Technology Agency (10 Member Group)</p> <p>Introductory presentation and IATT subgroup’s work: Mr. Naoto Kanehira, Senior Private Sector Specialist, the World Bank Group</p> <p>Panelists:</p> <ul style="list-style-type: none"> ● Mr. Tom Peter Migun Ogada, Executive Director, African Center for Technology Studies (ACTS) and Chairperson, Kenyan National Commission for Science, Technology and Innovation (NACOSTI) ● Mr. Dietrich Van der Weken, General Manager, Global Sustainable Technology and Innovation Conference (VITO/GSTIC) ● Mr. Has Bunton, Secretary General National Science and Technology, Ministry of Planning of Cambodia ● Ms. Monika Matusiak, Directorate General Joint Research Centre (JRC), European Commission, Directorate B – Growth and Innovation, Smart Specialisation Platform ● Mr. Jonathan Tsuen Yip Wong, Chief of Technology and Innovation, the Trade, Investment, and Innovation Division, ESCAP <p>Discussants:</p> <ul style="list-style-type: none"> ● Mr. Ludovico Alcorta, Professorial Fellow on "Technology, Innovation and Sustainable Development" at UNU MERIT, School of Business and Economics, University of Maastricht, The Netherlands ● Mr. Wei Liu, Coordinator, UN Inter-agency Task Team on Science, Technology and Innovation for the SDGs, DSDG/DESA <p><u>Guiding questions:</u></p> <ul style="list-style-type: none"> ● What are good examples of effective roadmaps? What are their characteristics? How would STI roadmaps for the SDGs need to differ from other more narrow roadmaps? What is the relationship to STI policy and development planning? How should new and emerging technology clusters be reflected in STI roadmaps for the SDGs? ● What is the status of the Global Pilot Program for STI for SDGs Roadmaps, guidebook on development of STI roadmaps, and state of deliberation in championing/pilot candidate countries? What institutional mechanisms needed to further engage countries to continuously scan the horizon, analyse the gaps, track progress and inform corrective measures? How to integrate roadmaps into established UN and IATT capacity building for STI? ● How to structure and organize a session on this topic during the STI Forum? Which speakers do you recommend? ● What are the concrete recommendations for action that could result from such a discussion at the STI Forum? What would be desirable STI Forum recommendations on the roadmaps?
10:30 – 10:45	Coffee Break
10:45 – 12:00	<p><u>Session 7: Gender and STI for SDGs</u></p> <p><i>This session will take stock of the key messages and recommendations highlighted in the area of gender and STI, and ways to harness the cross cutting nature of gender/STI for the achievement of the SDGs. It will also provide recommendations</i></p>

	<p><i>on how to structure a discussion on that theme during the STI Forum.</i></p> <p>Moderator: Dr. Agnes Lawrence Kijazi (United Republic of Tanzania), Director General, Tanzania Meteorological Agency (TMA) (10 Member Group co-chair)</p> <p>Panelists:</p> <ul style="list-style-type: none"> ● Ms. Maria Theresa Mateo, Managing Director, CXCatalysts ● Dr. Anthony C. Sales, Regional Director, Department of Science and Technology (DOST), The Philippines ● Ms. Araba Sey, Principal Research Fellow, UNU-CS <p>Discussant:</p> <ul style="list-style-type: none"> ● Ms. Julia Milton, Technology Focal Point (UN MGCY) and Human Systems Laboratory (MIT) <p><u>Guiding questions:</u></p> <ul style="list-style-type: none"> ● What are the main STI related challenges and solutions for women and girls and gender equality that should be addressed during the Forum? In particular: ● Challenges and opportunities for gender-responsiveness in STI/STEM fields? What are the policy measures and good practices to attract and retain women and girls, achieve gender parity and fully leverage women and girls' potential? ● Challenges and opportunities for leveraging STI to better address the needs of and empower women and girls. Potential speakers who can address the issues discussed?
12:00 – 13:30	<i>Lunch break</i>
14:00-15:15	<p>Commitments for the STI Forum, including substantive background papers and materials for the STI Forum</p> <ul style="list-style-type: none"> ● Moderator: Richard A Roehrl, Division for Sustainable Development Goals, DESA and Clovis Freire, UNCTAD <p>Open discussion and expressions of interest</p>
15:15 – 15:30	<p>Closing</p> <p>Mr. Jong Soo Yoon, Head of UNOSD Ms. Mia Mikic, Director of Trade, Investment and Innovation Division, ESCAP</p> <p>Mr. Clovis Freire, UNCTAD Mr. Shantanu Mukherjee, Chief of Branch, DESA</p>
15:30 – 16: 45	Closed meeting of IATT and 10 MG <u>on the STI Forum 2019</u>

	<p><i>Moderators: Shantanu Mukherjee (DESA) and Clovis Freire (UNCTAD) (TFM co-convenors)</i></p> <p><i>This session will discuss specific organizational elements, mobilisations of participants, division of labour and outreach for the STI Forum.</i></p> <p>Next steps</p> <ul style="list-style-type: none">• Dr. Agnes Lawrence Kijazi (United Republic of Tanzania), Director General, Tanzania Meteorological Agency (TMA)• Dr. Paulo Gadelha, former President, Oswaldo Cruz Foundation (Fiocruz), Brazil
--	--

List of participants

Member states

H.E. Mrs. Elizabeth Thompson, Ambassador Extraordinary and Plenipotentiary, Permanent Representative of Barbados, co-chair of the STI Forum
H.E. Mrs. Marie Chatardová, Ambassador Extraordinary and Plenipotentiary, Permanent Representative of the Czech Republic, former the President of ECOSOC, co-chair of the STI Forum
H.E. Mr. Has Bunton, Secretary General National Science and Technology, Ministry of Planning of Cambodia
Dr. Manpreet S. Manna, Former Director, Administration & Swayam, All India Council for Technical Education, Ministry of Human Resources Development, India

Experts

Mr. Tristan Ace, Social Enterprise Lead, British Council
Mr. Ludovico Alcorta, Professorial Fellow on "Technology, Innovation and Sustainable Development" at UNU MERIT, School of Business and Economics, University of Maastricht, The Netherlands
Prof. Tateo Arimoto, Professor of GRIPS and Principal Fellow of the Japan Science and Technology Agency (JST)
Mr. Shuvojit Banerjee, Macroeconomic Policy and Analysis Section, Macroeconomic Policy and Financing for Development Division
Dr. Susan Cozzens, Georgia Tech, USA
Ms. Minnie Degawan, Director, Indigenous and traditional peoples programme, Conservation International, Washington DC, Philippines
Dr. Anamika Dey, Honey Bee Network, India
Ms. Arisa Ema, Project Assistant Professor, Policy Alternatives Research Institute, The University of Tokyo, Japan
Ms. Yola Georgiadou, Professor, Department of Urban and Regional Planning and Geo-Information Management, University of Twente
Mr. Yuan Guangxia, Deputy Director of Exchange and Cooperation Division, on behalf of Mr. Wang Ruijun, former CSTD Chair, Head of Guangdong Science and Technology Department, China
Ms. Liang Ru, General Manager, General Manager, Guangdong Tops Soft-Park Co.
Ms.
Ms. Ding Meiji, Guangdong Science and Technology Department, China
Mr. Donovan Guttieres, MIT Center for Biomedical Innovation; UN Major Group for Children & Youth
Dr. Paula Hidalgo-Sanchis, Manager Pulse Lab Kampala (UN Global Pulse)
Dr. Aliza Belman Inbal, Director of the Pears Program for Global Innovation, Jerusalem Institute for Policy Research
Dr. Gong Ke, President Elect, World Federation of Engineering Organization; President of Nankai University, China
Dr. Bartłomiej Kolodziejczyk, Chief Technology Officer, H2sG Energy, Singapore/Australia

Mr. Edward Lorenz, Professor, Universite Cote d'Azur, France
 Ms. Maria Theresa Mateo, Managing Director, CXCatalysts
 Ms. Monika Matusiak, Directorate General Joint Research Centre (JRC), European Commission, Directorate B – Growth and Innovation, Smart Specialisation Platform
 Ms. Marianne Mensah, International Executive Director, Universite Cote d'Azur, France
 Ms. Julia Milton, Technology Focal Point (UN MGCY) and Human Systems Laboratory (MIT)
 Dr. Abdessalem Rabhi, Principal Programme Manager, IGES Kansai Research Center, Japan (under consultation with IGES)
 Mr. Tom Peter Migun Ogada, Executive Director, African Center for Technology Studies (ACTS) and Chairperson, Kenyan National Commission for Science, Technology and Innovation (NACOSTI)
 Dr. Anthony C. Sales, Regional Director, Department of Science and Technology (DOST), The Philippines
 Ms. Araba Sey, Principal Research Fellow, UNU-CS
 Mr. Chiung Song, Chief Director, Division of Global Innovation Strategy of the Science and Technology Policy Institute, Republic of Korea
 Ms. Sharmilla Binti Mohamed Salleh, Acting CEO, Yayasan Inovasi Malaysia
 Ms. Sanyukta Samaddar, Adviser, *Sustainable Development Goals/ Rural Development/Governing Council Secretariat Divisions*, NITI Aayog, Government of India
 Mr. Sameer Sharma, Senior Advisor, ITU, Regional Office for Asia-Pacific, Bangkok

Mr. Takaki Tsujimoto, Vice President, JETRO Bangkok
 Mr. Dietrich Van der Weken, General Manager, Global Sustainable Technology and Innovation Conference (VITO/GSTIC)
 Dr. Khalisah Zulkefli, Department of Biological Sciences, Sunway University, Malaysia

The 10 Member Group

Dr. Agnes Lawrence Kijazi (United Republic of Tanzania), Director General, Tanzania Meteorological Agency (TMA)
 Dr. Paulo Gadelha, former President, Oswaldo Cruz Foundation (Fiocruz), Brazil (10 Member Group)
 Professor Huadong Guo, President, Chairman Institute of Remote Sensing and Digital Earth of the Chinese Academy of Sciences (CAS) China (10 Member Group)
 Dr. Michiharu Nakamura, Senior Advisor (Former President), Japan Science and Technology Agency (10 Member Group)
 Dr. Anne-Christine Ritschkoff, Senior Advisor, VTT Technical Research Center of Finland Ltd., Finland (10 Member Group)
 Dr. José Ramón López-Portillo Romano, Chairman/non-Executive Director Zenith Energy Ltd, Mexico (10 Member Group)
 Ms. Špela Stres, Director, Innovation and Technology Transfer Center for the Jozef Stefan Institute, Slovenia (10 Member Group)

United Nations Secretariat

United Nations Department for Economic and Social Affairs

Mr. Shantanu Mukherjee, Chief, Integrated Policy Analysis Branch, DSDG, DESA
Mr. Wei Liu, Coordinator, UN Inter-agency Task Team on Science, Technology and Innovation for the SDGs, DESA
Mr. Richard A Roehrl, Senior Economic Affairs Officer, DSDG, DESA
Ms. Stephanie Rambler, Sustainable Development Officer, DSDG, DESA

United Nations Economic and Social Commission for Asia and the Pacific

Ms. Mia Mikic, Director of Trade, Investment and Innovation Division, ESCAP
Mr. Jonathan Tsuen Yip Wong, Chief of Technology and Innovation, the Trade, Investment, and Innovation Division, ESCAP
Mr Anis Zaman, Energy Division, ESCAP
Ms. Marta Pérez Cusó, Technology and Innovation Section, Trade, Investment and Innovation Division, ESCAP

United Nations Conference on Trade and Development

Mr. Clovis Freire, Division for Technology and Logistics, UNCTAD

United Nations Office for Sustainable Development

Dr. Jong Soo Yoon, Head of UNOSD

United Nations Educational, Scientific and Cultural Organization

Ms. Jonghwi Park, UNESCO Asia Pacific Regional Bureau for Education

United Nations Framework Convention on Climate Change

Mr. Bert van der Plas, UNFCCC Secretariat.

United Nations Technology Bank for the LDCs

Ms. Simone Rose, Programme Management Officer

United Nations OICT

Mr. Dinh-Huy Banh, Service Chief

United Nations Industrial Development Organization (UNIDO)

Mr. Stein Hansen, Director and UNIDO Representative

United Nations Economic Commission for Africa

Mr. Kasirim Nwuke, Chief of Technology & Innovation Special Initiatives Division, ECA

World Bank

Mr. Naoto Kanehira, Senior Private Sector Specialist, the World Bank Group