



Economic Commission for Africa

Africa Regional Science, Technology and Innovation Forum

Third session

Kigali, Rwanda 01-02 March 2022

“Strengthening STI Institutional Arrangements to Advance Full Implementation of the 2030 Agenda for Sustainable Development in Africa”

I. Background and mandate

1. The 2030 Agenda for Sustainable Development established the collaborative Multi-Stakeholder Science, Technology, and Innovation Forum for the Sustainable Development Goals (STI Forum) as part of the Technology Facilitation Mechanism (TFM). The TFM was established by the Addis Ababa Action Agenda and was launched by the 2030 Agenda for Sustainable Development to support the implementation of the Sustainable Development Goals. The global Forum is organized by the United Nations Inter-Agency Task Team (IATT) on Science, Technology and Innovation for the Sustainable Development Goals, with the support of a 10-member group appointed by the United Nations Secretary-General drawn from the private sector, scientific community and civil society.¹
2. The global Multi-Stakeholder STI Forum is convened once a year to “discuss science, technology and innovation cooperation around thematic areas for the implementation of the Sustainable Development Goals, congregating all relevant stakeholders to actively contribute in their area of expertise”, as well as to “provide a venue for facilitating interaction, matchmaking and the establishment of networks between relevant stakeholders and multi-stakeholder partnerships in order to identify and examine technology needs and gaps, including with regard to scientific cooperation, innovation and capacity-building”.² All these measures are expected to help facilitate the development, transfer and dissemination of relevant technologies for the Sustainable Development Goals.
3. The Africa Regional Science, Technology and Innovation Forum was established by the Conference of Ministers, in its resolution 960 (LI) of 15 May 2018, calling on the Economic Commission for Africa (ECA), in collaboration with the African Union Commission and other partners, to take all steps necessary to organize on a regular basis a multi-stakeholder forum on science, technology and innovation as an input into the work of

¹ A/RES/70/1.

² Ibid., para. 70.

the Africa Regional Forum on Sustainable Development and the Multi-stakeholder Science, Technology and Innovation Forum for the Sustainable Development Goals.

4. The first African Regional Science, Technology and Innovation Forum was held in Marrakech, Morocco, on 16 April 2019, the second Forum was held on 24 February 2020 in Victoria Falls, Zimbabwe, and the third Forum was hosted by the Republic of Congo in Brazzaville from 25 to 26 February 2021. The Fora are co-organized with the United Nations, Educational, Scientific and Cultural Organization (UNESCO) and the Department of Science and Innovation, South Africa together with the host country.

5. The Forum has grown into a premier continental platform for interrogating complex issues, showcasing emerging developments in STI, instilling technical and entrepreneurial skills among the youth and for forging long-lasting partnerships and alliances. In 2020, over 800 delegates representing African Member States, the United Nations agencies, academia, civil society, the youth, marginalized groups, the private sector and people that are differently enabled were in attendance. In 2021, the Forum was organized in a hybrid format and brought together over 600 registered participants.

6. Since 2020, a Youth Innovation Bootcamp has been organized as part of the Africa Regional STI Forum. The Bootcamp attracts young people from across the continent and beyond to collaborate in the design and development of innovative solutions and learn new technologies such as rapid prototyping using 3D printing, genomics, robotics, artificial intelligence, and nanotechnology as well as introduction to entrepreneurship concepts and competencies, and the UNESCO microscience experiment..

II. Progress in Meetings the 2021 Key Messages

7. The Africa Regional STI Forum made nine specific recommendations to Regional Economic Commissions, organizing partners and member States. The following summary of the recommendations (in *Italics*) and actions taken (in normal text) is here provided:

- i. *Work with the RECs and Member States to develop action plans, mobilize adequate resources for implementation, as well as monitoring and evaluation of the recommendations of the STI forums during the intersession period.* This recommendation has not been fully realized even though some RECs such as SADC have worked with the organizers of the STI Forum;
- ii. *Member States called upon the UN system and other development partners for support in enhancing the national capacity to design, implement, monitor and evaluate STI policies and strategies.* ECA and its partners have completed the design of the STI Policy Formulation and Implementation Guide as well as supported the work of the Inter-agency Task Team on STI in implementations of the STI Roadmaps for the SDGs;
- iii. *Urge Member States and partners to develop databases and platforms for collection of quality, accessible and open data, including scientific information, to promote research, innovation and product (goods and services) development, especially for the digital economy.* A survey of about 20 African universities in Algeria, Ethiopia, Ghana and South Africa on progress towards becoming

entrepreneurial in nature that was concluded in 2021; and a second-round survey that further includes Egypt, Kenya and Rwanda provide valuable data to support national efforts in ensuring universities serve as engines of economic, social and environmental sustainable development.

- iv. *Urge Member States and their partners to reform national education systems and provide incentives to research institutions to promote entrepreneurship in their communities and society at large.* The work on advancing entrepreneurial universities includes a special focus on two dimensions – entrepreneurial pathways and partnership with private sector and the community.
- v. *Encourage Member States and development partners to put into place strategies for accelerating the uptake and diffusion of emerging technologies especially nanotechnology, biotechnology, AI and robotics.* In this regard, three generic BSc/MSc curriculums were finalized in 2021. These are for (i) Artificial Intelligence (ii) Materials Sciences and Nanotechnology and (iii) Pharmaceutical Chemistry and Manufacturing
- vi. *Encourage Member States to put into place infrastructure, standards and regulatory frameworks, as well as strengthen their supply chain for the pharmaceutical industry to accelerate innovation, manufacturing and marketing of pharmaceutical products and medical devices, especially to build resilience of the health sector response to pandemics.* To support this effort, the Secretariat has completed the generic curriculum that universities can easily adapt to design BSc/MSc programmes in Pharmaceutical Chemistry and Manufacturing. It has also developed the African Medical Supplies Platform³ to reduce costs and enhance transparent procurement of pharmaceuticals, medical devices and related products.
- vii. *To transform Africa into a global research hub, encourage member States to build accessible and reliable key STI infrastructure, especially renewable energy and digital communication, and to empower their youth and women, particularly in STEM.* ECA and the Government of Congo launched the Regional Centre on Artificial Intelligence; Democratic Republic Congo launched the plant to build electric battery precursors; and various countries (Egypt, Ghana, Kenya, Mauritius, Morocco, Namibia and South Africa) have launched hydrogen energy and solar plants.
- viii. *Urge Member States to meet their commitment to increase expenditure on research and development to at least 1% of their GDP.* This recommendation remains unmet.
- ix. *Call upon ECA, UNESCO, the Government of South Africa and Partners to work with Member States to scale-up and regularly organise youth innovation bootcamps that accelerate the acquisition of technical and entrepreneurial skills*

³ <https://amsp.africa/>

among the youth, especially in new and emerging technologies. The partners have organized about seven bootcamps that benefited over 80,000 participants, of which over 80% were female.

8. In addition, the UN Interagency Task Team on Science, Technology and Innovation (IATT), comprising all UN entities, held several events during the Multistakeholder STI Forum and on the margins of the High Level Political Forum. These included the STI roadmaps for the SDGs who were part of the pilot phase and shared the approach and methodology. The five countries (Ethiopia, Ghana, India, Japan, Kenya and Serbia) in the Global Pilot Programme on STI Roadmaps for SDGs shared their experience. Ghana, Japan and Serbia have published their STI Roadmaps for the SDGs.

II. The Fourth Science, Technology and Innovation Forum

9. The fourth Africa Regional STI Forum will be held on 28 February to 1 March 2022, in a hybrid format in Kigali, Rwanda. The Forum is co-organized with the United Nations Educational, Scientific and Cultural Organization (UNESCO), African Union Commission (AUC), the Department of Science and Innovation, South Africa. Other key partners include the United Nations Technology Bank for the Least Developed Countries (UNTB/LDCs), the International Atomic Energy Agency (IAEA), African Materials Research Society (AMRS) and the African Biomedical Engineering Consortium (ABEC). The Forum is designed to meet both the global and continental mandates.

10. To meet its mandate to provide inputs into the ARFSD-8, the STI Forum will look at how STI could help the continent meet and contribute to the realization of the theme of the ARFSD: **“Building back better from the coronavirus (COVID-19) while advancing the full implementation of the 2030 Agenda for Sustainable Development”** and in-depth review of Sustainable Development Goals 4 (Education), 5 (Gender Equality), 14 (Life below Water), 15 (Life on Land) and 17 (Partnership) and the corresponding goals of Agenda 2063.

11. Education – both as a sector and enabler – has been the focus of the Africa Regional STI Forum. Education is a key input into the national systems of innovation, a powerful tool for enabling individuals to determine their own future and one of the largest sectors of any country. Education consumes a large proportion of national budgets (about 10%), employ thousands of teachers, technicians, managers, politicians and other stakeholders. In a continent that is young and whose population is growing rapidly, schools and their support facilities (e.g. libraries, laboratories, sports and staff housing etc) need to be built and maintained.

12. Technology and innovation play an important role in enhancing the learning experience of students and enabling teachers to stay in touch with learners from anywhere in the world. It is now possible for a student in Africa to be enrolled in Asia and have tutor in Europe for as little as \$20 per month and/or to remotely conduct high-end laboratory research experiments such as high-resolution X-Ray diffraction. Similar, the Education Technology (EdTech) industry has been growing rapidly. Estimates suggest that Africa’s EdTech market reached \$1.5 billion in 2020 and is expected to hit \$10.9 billion by 2026 and is growing at about 36.5% a year⁴.

⁴ <https://www.expertmarketresearch.com/reports/africa-e-learning-market>

13. However, this progress should be measured against the bigger picture: while primary school enrolment is about 80%, the dropout rates remain high (up to 42% of primary school children in Africa dropout)⁵ and very few are likely complete secondary or tertiary education. One estimate suggests that only 17 million of the 500 million kids in primary schools in Africa ever enter higher education⁶. Therefore, technology should help address gaps in access, equality and quality of education by generating alternative business models and options to bring quality and inclusive education to all.

14. Gender equality has been a major component of the STI Forum. For instance, the first STI Forum Youth Innovation Bootcamp brought together over 200 young people, with a majority being female. Since then, ECA has organized three all-female bootcamps focused on digital skills and digital opportunities, including careers and business opportunities. Therefore, there is need to design and advance mechanisms that do not only increase the numbers of female involved but also the quality of opportunities, participation and leadership accorded to female participants. Currently, about 1 in 5 R&D researchers in Africa are women – a sad statistic that must change if STI is to advance gender equality in other sectors.

15. Life under water and life on land remain main areas of interest to STI – both in terms of scientific exploration and sustainable exploitation of resources. While the greater interest is in sustainable exploitation of the green and blue economy, scientific understanding on the impact of pollution, climate change and the various human activities on the ability of land and aquatic bodies is needed.

16. In terms of economic and social contributions, estimates suggest that the global ocean economy is worth about \$1.5 trillion. In Africa, about 275 million people depend on fish for food security, with the small-scale sector accounting for more than 60% of total fisheries production and employs about 12 million people with women playing a key role in processing and marketing⁷. There is a general agreement that overfishing, illegal fishing and warming of water bodies as well as contamination have led to a decline in fish population in water bodies putting lives and livelihoods at risk⁸.

17. According to IUCN, about 68% of known plants species, 12% of bird species and 90% of primates are disappearing or threatened with extinction while half of the world's mammals are declining largely due to human activity, climate change and natural disasters. For instance, deforestation in Africa would alter rainfall patterns which could negatively impact rain-fed agriculture⁹. With about 281.6 million Africans undernourished in 2020, pressure on land to produce food is likely to remain high. Forests are also a major source of energy for the 650 million people without access to electricity on the continent.

⁵ http://www.unesco.org/new/en/member-states/single-view/news/42_of_african_school_children_will_drop_out_before_the_end/

⁶ <https://kenza-bouhaj.medium.com/edtech-in-africa-a-landscape-6bb03c299b33>

⁷ <https://www.riob.org/sites/default/files/documents/AfDB%20Blue%20Economy%20Flagship%20-%20Briefing%20Note%20November%202018.pdf>

⁸ Chan, C.Y., Tran, N., Pethiyagoda, S. et al (2019) Prospects and challenges of fish for food security in Africa, *Global Food Security*, 20: 17-25

⁹ Confidence Duku and Lars Hein (2021) The impact of deforestation on rainfall in Africa: a data-driven assessment, *Environ. Res. Lett.* 16: 064044

18. New and emerging technologies promise to improve monitoring and management of forests, increase productivity of farms, expand access to renewable and clean energy sources and alter both production and consumption. The STI Forum will explore some of the emerging technologies and business models, and their potential to make a meaningful impact on meeting the 2030 Agenda for Sustainable Development.

19. Further, the STI Forum will also provide a platform to identify and examine technology needs and institutional voids that should be addressed to enable African countries to fully harness and deploy science, technology and innovation to accelerate the achievement of the Sustainable Development Goals as well as the corresponding goals of the African Union Agenda 2063.

III. The Theme of the STI Forum

20. As noted earlier, the Theme of the ARFSD-8 is *“Building back better from the coronavirus (COVID-19) while advancing the full implementation of the 2030 Agenda for Sustainable Development”* with a focus on Goals 4, 5, 13, 14 and 17. To enable STI contribute effectively, efforts to strengthen STI institutional arrangements are needed. Such institutional arrangements may include those involved in STI governance, policy formulation and implementation, technology development and deployment, funding research and development, promoting or facilitating partnership between all the key players in STI, among others.

21. The fourth STI Forum will focus on **“Strengthening STI Institutional Arrangements to Advance Full Implementation of the 2030 Agenda for Sustainable Development in Africa”**. To achieve this goal, the Forum will see the launch of a number of initiatives aimed at helping member States strengthen their institutional arrangements as well as meeting the goals of “facilitating interaction, matchmaking and the establishment of networks”.¹⁰ In this regard, the fourth Africa Regional STI Forum will provide opportunities for matchmaking, networking and partnerships to advance sustainable development.

a) The STI Policy Formulation and Implementation Guide.

22. The Addis Ababa Action Agenda (AAA) called on member States to design STI policies to drive development. Since then, the UN Interagency Task Team on STI for the Sustainable Development Goals and the 10-member group appointed the UN Secretary General have developed the STI Roadmaps for the Sustainable Development Goals (or STI Roadmaps). This is a major step towards helping member States identify needs and develop plans that can be implemented. Other notable efforts include those of UNESCO, UNCTAD and UNIDO that support countries undertake reviews or formulate STI policies.

23. This effort will see the formal launch of the ECA-led STI Formulations and Implementation Guide intended to support all the above efforts and arm member States with all the needed information to design, draft, adopt, implement, monitor and evaluate STI policies independently or with partners. It is also a living document that will continuously be reviewed and supplemented by national, regional and international experiences. The Guide has already been reviewed three times by experts and policy makers.

b) Network of Entrepreneurial Universities in Africa and first report.

¹⁰ Ibid., para. 70.

24. The last two STI Forums (i.e. 2020 and 2021) called for efforts to encourage universities to become providers of goods and services as well as change agents. To meet this call, ECA, Algeria, Ethiopia, Ghana and South Africa spearheaded national surveys of universities and held joint consultative meetings on current state of play of selected universities towards being entrepreneurial in nature. Since then, the work has been extended to include Egypt, Kenya and Rwanda who will be joining Algeria, Ethiopia, Ghana and South Africa. This session will share both experiences learnt and forge ways to expand this line of work to other interested African countries and universities. The main aim is to launch a community of practice or alliance of entrepreneurial universities in Africa

c) The Technology Development and Transfer Network

25. Technology plays an important role in national development and newer technologies are widening the technology gap between leading nations (e.g. United States of America, Republic of Korea) and African countries even further. Accessing technology developed by other countries could narrow the development gap if countries have institutions that can drive technological learning and development. The case of COVID-19 vaccines highlights this knowledge gap: most technology owners are happy to partner with existing vaccine producers than with African countries. Further, of the hundreds of vaccines under development and in clinical trials, almost none are led by African teams or countries. Yet countries such as Cuba, Kazakhstan and Thailand have their own vaccines under development. Africa has the opportunity to access seed breeding technologies for agriculture, digital technologies platforms, renewable energy technologies or new vaccine production technologies for COVID-19.

26. To meet the above aim, this effort will bring together interested leaders in R&D, industry, technology transfer and policy makers that can exchange information, share technologies or technology development platforms and help broker technology deals from both domestic and international partners. This component is also likely to support universities and R&D institutions to understand the current and future technology needs of industry and other communities they serve which will in turn improve setting of R&D agendas and relevancy of R&D outputs.

IV> Objective of the African Science, Technology and Innovation Forum

27. The overall objective of the fourth African Science, Technology and Innovation Forum is to conduct a regional follow-up and review of progress made, in order to identify potential mechanisms and measures that countries can deploy to scale up actions, facilitate peer learning and advance transformative solutions to accelerate implementation of the Sustainable Development Goals and the goals of Agenda 2063. These include:

- (a) Conduct a regional follow-up to, and review of, the implementation of the key messages and measures recommended at the previous Forum;
- (b) Provide a platform for peer learning and sharing experiences, approaches, good practices and lessons learned, in order to accelerate the realization of the aspiration of 2030 Agenda for Sustainable Development and Agenda 2063 of the African Union;
- (c) Identify the technological opportunities, gaps and challenges as well as the institutional voids that can help drive innovation and development.
- (d) Identify actionable mechanisms for collaboration and matchmaking, to strengthen regional and international partnerships and investments in science, technology and innovation, to accelerate implementation of the two agendas within the decade 2020–2030.

IV. Format of the fourth African Science, Technology and Innovation Forum

28. The fourth African Science, Technology and Innovation Forum will comprise the following activities, high-level policy dialogues, panel discussions and showcasing events:

(a) *High-level policy dialogues:* At least four high-level policy dialogues comprising Senior Governments, ministers, heads of United Nations agencies, and chief executive officers of firms, as well as vice chancellors of universities and heads of research and technology organizations, will be organized. The interactive high-level policy dialogues will focus on broad and cross-cutting issues and strategic direction, including opportunities and transformative levers, partnerships, commitments, actions and other measures to accelerate implementation.

(b) *Panel sessions to assess progress on the 2030 Agenda and Agenda 2063:* At least five sessions (on Education, Gender, Life under Water and Life on Land) will be held to assess progress and contribution of STI so far registered, and actions needed to amplify the impact of STI in meeting the Sustainable Development Goals. All panel sessions may include key presentations and town hall fashion discussion to encourage free interactions to occur.

(c) *Special sessions:* There are several special sessions and events that are intended to inform the Forum organized by partners and ECA. One of these is the Youth Bootcamp on Technologies and Innovations of the Future.

(d) *Review and adoption of key messages of the Forum:* During this part of the Forum, all stakeholders will review, propose amendments to and adopt the key messages aimed at accelerating implementation and to be submitted to the Africa Regional Forum on Sustainable Development 2021 and to inform the Inter-Agency Task Team on Science, Technology and Innovation for the Sustainable Development Goals as well as the Multi-stakeholder STI Forum.

V. Expected outputs

29. The meeting will generate the following key outputs:

(a) A report of the African Science, Technology and Innovation Forum that will inform the Africa Regional Forum on Sustainable Development and the Multi-Stakeholder STI Forum;

(b) Outcome documents of special sessions and events such as the Youth Bootcamp; and

(c) A general guide for implementing regional networks and platforms facilitating technology transfer, collaboration and STI Policy Formulation and Implementation.

VI. Expected outcomes

30. The fourth African Science, Technology and Innovation Forum is consciously designed to foster collaborations, diffusion of technology and innovation, and scale-

up policy and operational efforts needed to accelerate the contribution of STI to meet the 2030 Agenda for Sustainable Development. Specifically, the following will be the key tangible and intangible outcomes:

- (a) A report of key outcomes that could guide Member States, the private sector and non-State actors to improve their STI policies and amplify the impact of STI on measures to accelerate the achievement of the two agendas.
- (b) Strategies to strength STI institutional arrangements that can drive policy implementation, improve funding mechanisms for R&D, innovation and entrepreneurship will be identified and documented to help Member States build sound scientific, technological and innovation foundation.
- (c) Regional networks and platform for exchanging information on funding, innovations and institutions launched to accelerate technology transfer, collaboration and co-creation among key STI partners in Africa.

VII. Participants

31. The meeting will be attended by representatives of:

All African Member States of the United Nations, the African Union Commission, African Development Bank, regional economic communities, civil society, business and industry organizations, academia and research institutions, agencies and organizations of the United Nations system, and other international agencies and organizations, as well as all development partners.

VIII. Working languages

32. The meeting will be conducted in English and French, with simultaneous interpretation in both languages.

IX. Dates and venue

33. The fourth African Science, Technology and Innovation Forum will be held in Kigali, Rwanda from 1-2 March 2022.

X. Contacts

For enquiries, please contact:

1. Asfaw Yitna, Research Assistant, ECA. Email: yitna@un.org
2. Martiale Zebaze Kana, Head Science Unit, UNESCO Regional Office for Southern Africa. Email: m.zebaze-kana@unesco.org
3. Dr. Samuel Chigome, President – Africa Materials Research Society (AMRS), email: SChigome@bitri.co.bw
4. Mmampei Chaba, Chief Director: Multilateral Cooperation and Africa, Department of Science and Technology of South Africa. Email: Mmampei.Chaba@dst.gov.za
5. Ao Kong, Senior Program Advisor, United Nations Technology Bank for Least Developed Countries. Email: konga@un.org