Report of the Malawi National Science, Technology and Innovation Policy (NSTIP) National Stakeholder Consultative Workshop

SCIENCE FOR AFRICA
FOUNDATION

Introduction

This report summarises the key discussions and outcomes of the Malawi National Stakeholder Consultative Workshop on National Science, Technology and Innovation Policy (NSTIP), held in Lilongwe from 12 to 14 February 2024.

As Artificial Intelligence (AI) applications expand globally, its potential to revolutionise healthcare becomes increasingly evident. This technological surge of AI is transforming healthcare delivery, especially in low- and middle-income countries (LMICs) (Nigeria is a notable example.). Moreover, the STISA-2024 review recommends that the Africa Union (AU) STISA-2034 focus on the governance of emerging technologies, particularly AI, making it an opportune time for action.

The Science for Africa Foundation (SFAFoundation) seeks to support African countries in strengthening the governance of AI and data science in health. To this end, the SFA Foundation conducted a series of regional consultations, an online survey, and expert interviews to identify gaps in policies and regulations and to make recommendations to build capacities on the continent. The SFA Foundation initiative also incorporated commissioned papers on gender in AI, and bibliometric analysis. It identifies essential principles and policy issues for effective AI governance, including the need to develop dedicated regimes in Africa for the good and effective governance of AI for global health.

This workshop sought to inform policy development, integrate AI initiatives into national frameworks, align continental agendas, and foster capacity-building and knowledge-sharing in Malawi's AI ecosystem. The discussion included the findings of the SFA Foundation report, and an articulation of Malawi's need to incorporate AI policy into national policy, aligned with the Africa Union STISA 2063 and the AUDA AI roadmap.

The overall goal of the workshop was to address the delayed review of the country's Science and Technology (S&T) Policy of 2002 and position Malawi on a trajectory of dynamic and inclusive growth, where STI propels the nation towards a prosperous future. The workshop also aspired to generate input into the drafting of the NSTIP and related AI policies.

Participants at the Malawi National Stakeholder Consultative Workshop on National Science, Technology and Innovation Policy (NSTIP), held in Lilongwe from 12 - 14 February 2024. PHOTO | COURTESY

Background

On 19 January 2021, the government of the Republic of Malawi launched Malawi 2063 (MW2063), a youth-centric national vision to create "an inclusively wealthy and self-reliant nation by 2063" through the establishment of an innovation-led, knowledge-based economy (National Planning Commission, 2020[1]). MW2063 prioritises sustained domestic and foreign investment through agricultural productivity and commercialisation, industrialisation and urbanisation. This vision builds upon its predecessors, the Malawi Growth and Development Strategy III (MGDS III) 2017-2022 and Malawi Vision 2020, and aligns with the African Union Agenda 2063 and the United Nations Sustainable Development Goals (SDGs).

Problem Statement

The 2002 Malawi Science and Technology (S&T) policy was implemented but never revised. This lack of currency presents significant challenges to the successful execution of MW2063. The rapid advancement of emerging technologies like big data and AI, coupled with minimal integration of Indigenous Knowledge Systems, necessitates an urgent update to Malawi's STI

1 https://npc.mw/wp-content/uploads/2021/11/MIP-1-WEb-Version-8-November-2021-Fast-view.pdf

policy framework. A modernised NSTIP, covering the lifespans of the United Nations Sustainable Development Cooperation Framework (2024 – 2028), SDGs 2030, the Science, Technology & Innovation Strategy for Africa (STISA) 2034, and the MW2063, is crucial to ensure that Malawian citizens fully participate in STI policy implementation and benefit equitably from the opportunities presented by these advancements.

Goal

The primary goal of the workshop was to review and revise collaboratively the National Science, Technology and Innovation Policy (NSTIP) for Malawi. This included integrating strategies for indigenous technologies and emerging technologies like AI, space and electric vehicles (EVs), among others, into the national STI landscape. The focus was on creating a policy framework that leverages and generates multi-sectoral knowledge to inform collaborative decision-making on critical challenges in STI development, ultimately paving the way to address Malawi's developmental needs as well as contribute to broader continental and global progress.

Specific Objectives
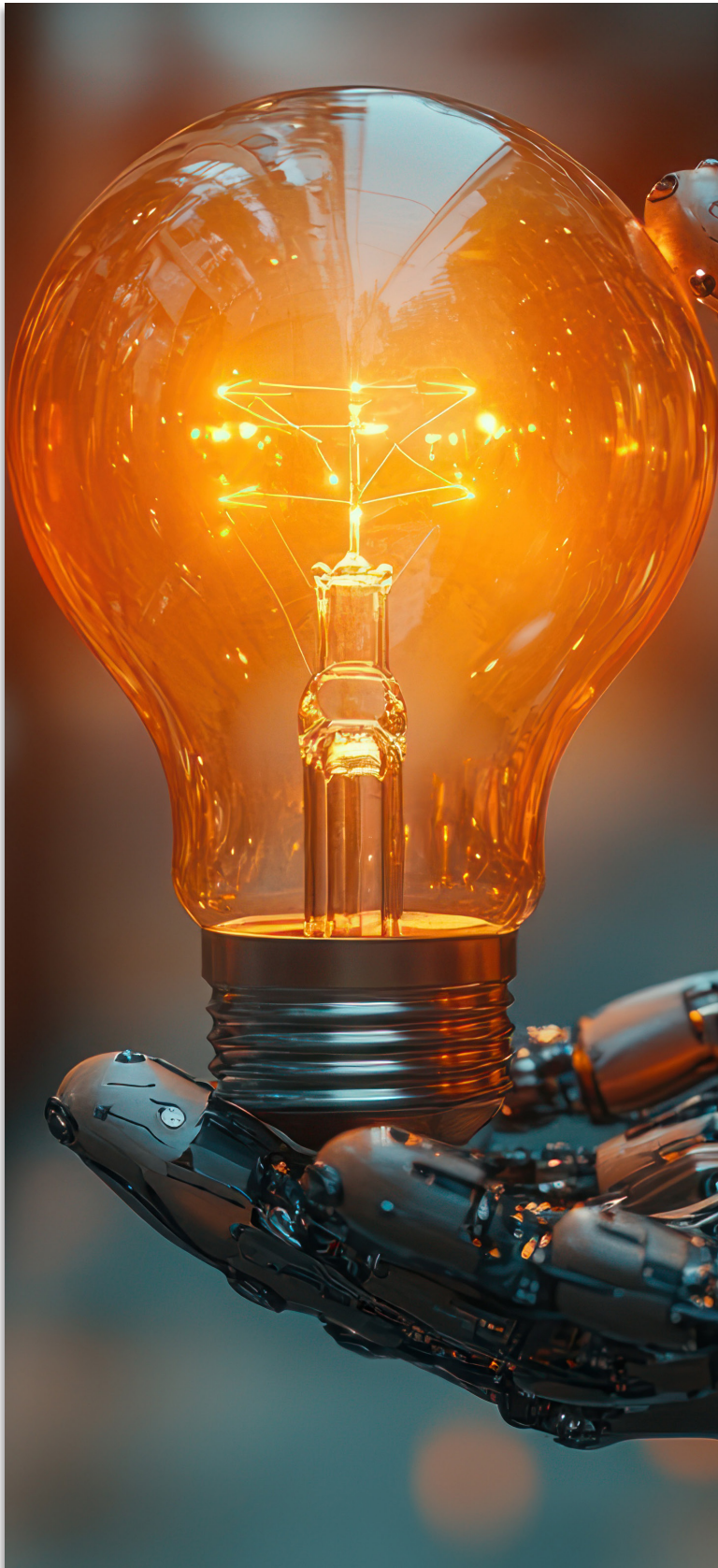
The specific objectives of the workshop were to:

1. **Align the S&T Policy** of the 2002 the National STI System with the demands of the Fourth Industrial Revolution (4IR), ensuring that Malawi is an active participant in the ongoing global technological revolution.

2. **Coordinate Malawi's NSTIP with the African Union**'s Science, Technology and Innovation Strategy for Africa (STISA) 2024 (currently under review), to foster regional collaboration and synergy in the advancement of STI.

3. **Develop strategies for scaling and efficient commercialisation** of indigenous technologies by integrating emerging technologies, including AI, into the national STI landscape, ensuring that Malawi is at the forefront of cutting-edge advancement.

4. **Embed ethical, as well as diversity, equity, and inclusion (DEI)** considerations into the NSTIP, to safeguard against potential risks and foster responsible innovation in and for the country.

5. **Create a vibrant and inclusive STI ecosystem** that addresses disparities and nurtures youth participation in policy development, guided by clear policy provisions and offering a conducive environment for experimentation, investment and sustainable business growth.

6. **Establish guidelines for private sector participation** in STI development, catalysing economic advancement by integrating indigenous and emerging technologies, driving entrepreneurship and positioning Malawi as a hub for technological innovation; and

7. **Align closely with the aspirations of MW2063 and the country's first-ever National Research Agenda (NRA)** to ensure that STI plays a central role in promoting inclusive and sustainable national development and growth.

Stakeholder Perspectives

Malawi Government

Article 13 of the Republic of Malawi's Constitution, the Principles of National Policy, prioritises gender equality alongside other fundamental rights like education, health, support of rural life and environmental protection (education is also enshrined as a fundamental right in Article 25.) This commitment to equity extends to policy development to ensure that the needs of women, youth and underserved communities are addressed through targeted initiatives within the National Science, Technology and Innovation Policy (NSTIP).

While the existing Science and Technology (S&T) policy has served Malawi for a significant period, public demand for an update has played a crucial role in shaping the NSTIP (currently under development), with a commitment to finalise by year-end 2024.) Malawians actively participated in the development of the NSTIP between 2020 and 2021 through a government-sponsored public policy review process. The NSTIP will be implemented over a 10-year period, ending 2034.

The workshop featured national government representatives who outlined their commitment to the NSTIP. Designated working groups, approved by the government, will be established within relevant the ministries to contribute to the policy's development and implementation. The National Planning Commission (NPC) will assume accountability for progress of the NSTIP, reporting directly to the Office of the President and Cabinet. As noted above, Malawi's NSTIP will be aligned with the African Union's Science, Technology and Innovation Strategy for Africa (STISA) 2034.

A dedicated team, including the National Commission for Science and Technology (NCST), the Ministry of Education Directorates of Education Planning (DEP) and Science Technology and Innovation (DSTI) and the Ministry of Justice's Chief Legal Officer are spearheading the development of the NSTIP, guided by the Policy Unit of the Office of the President and Cabinet.

Ministry of Education

The Ministry of Education views the new National Science, Technology and Innovation Policy (NSTIP) as a critical investment in Malawi's future. Aligned with UN Sustainable Development Goal 17 (Partnerships), the NSTIP seeks to drive national prosperity and inclusivity for Malawian citizens while contributing significantly and tangibly to the country's human capital development efforts. This renewed focus on science, technology and innovation acknowledges the limitations of the outdated 2002 S&T policy. As reflected in Malawi's Year of Education theme, adapted from the AU: "Propelling Malawi's Education Renaissance in the Digital Age", the Ministry of Education recognises the increasing importance of digitalisation in developing capable, knowledgeable and skilled human capital for the 21st Century, and the urgent need to preserve and leverage Malawi's Indigenous Knowledge Systems.

To address these challenges, the Ministry is collaborating with the SFA Foundation to revise the NSTIP and explore the integration of indigenous and Artificial Intelligence (AI) strategies into the policy framework.

By facilitating the integration of these diverse knowledge systems and STIs into Malawi's policy framework, this partnership will enhance the efficiency of public and private service delivery, ultimately fostering Malawi's sustainable economic growth and strengthening its STI landscape.

National Commission of Science and Technology

The National Commission on Science and Technology (NCST) emphasises that a priority for the team revising Malawi's Science and Technology (S&T) policy should be fostering of a national culture of innovation. Cultivating such an environment in the new policy framework will be crucial for achieving the country's MW2063 vision.

Specific Objectives

Malawi's Space Agency

While Malawi does not currently have an established Space Agency, the nation's commitment to Science, Technology and Innovation (STI) is evident in its efforts to harness space resources for sustainable national development and growth. This includes fostering collaboration with established space agencies, like South Africa's, through consultations and partnerships.

In recognition of the immense potential of STI, the Government of Malawi is taking bold steps to equip its citizens with the necessary tools for success in the 21st Century by, for example, integrating space sciences into the national curriculum. By exposing students to these subjects at a young age, the nation can cultivate a future generation of space scientists and innovators who will drive further advancements in the field.

Moreover, the focus extends beyond Malawi's borders by addressing the broader intellectual property landscape as the African continent embraces innovation. Strong mechanisms must be implemented to ensure that the intellectual property rights of innovators are respected and upheld.

The Malawi National Research Agenda is driving STI research, and has made significant strides through initiatives such as space exploration agency development, encouraging international collaboration and investing in science education.

The Malawi Communications Regulatory Authority (MACRA) Universal Service Fund (USF)

The MACRA Universal Service Fund (USF) plays a critical role in addressing Malawi's digital divide. Its programmes include the establishment of smart laboratories in rural schools, construction of telecommunications towers in previously unconnected areas, and advocacy for digital literacy programmes. The USF also actively supports local Information and Communication Technology (ICT) projects and fosters collaboration with local governments to tackle challenges in agriculture, health and education. Ensuring the long-term sustainability of these projects beyond 2034 remains a key concern.

In parallel, policy development is also under scrutiny. Weaknesses in the current framework include the slow pace of policy updates to address technological advancements, the lack of robust integration of ethical considerations, and insufficient collaboration with international tech giants like Google and Microsoft. The government, through the NCST, is actively creating a platform to facilitate such partnerships, and exploration of potential policy experiments that directly address current challenges is ongoing.

While the national government has established academia-industry partnerships, young innovators who might otherwise be excluded by traditional Science and Technology structures must be more actively welcomed, given that the policy prioritises the development and utilisation of local skills and innovations, including frugal and appropriate technologies and innovation. The NSTIP Core Team proposed that revisions to seven priority areas and policy statements be made in Chapter 3 of the policy formulation to achieve these goals.

Proposed Structure of the Policy

It is important to note that the policy is currently in the early stages of consultation.

Chapter 1: Introduction

Chapter 2: Broad Policy Objectives

Chapter 3: Policy Priority Areas

Chapter 4: Implementation Arrangements

The African Union's Agenda 2063: Priority Areas (with Key Sub-Points)

The African Union's Agenda 2063 outlines seven 'Moonshot Goals' to guide the continent's development over the next 50 years. The NSTIP will strategically align with these goals, particularly those relevant to science, technology and innovation. The seven Moonshot Goals are:

1 African citizens are wealthier, & every AU Member State attains at least middle-income status.

2 Africa is more integrated and connected.

3 All the public institutions are more responsive.

4 Africa resolves conflicts amicably

5 African values are explicit and promoted.

6 African citizens are more empowered and productive.

7 Africa is a strong and influential global player.

Presentation on the National Science, Technology and Innovation Policy (NSTIP) Draft Policy Priority Areas (PPAs)

This workshop presentation explored the draft Policy Priority Areas (PPAs) of Malawi's National Science, Technology and Innovation Policy (NSTIP). The NSTIP takes a problem-solving approach, prioritising innovation to address current challenges across various key economic sectors. Particularly high priority are collaborations and partnerships among government, education and training institutions, research institutions, industry, youth- and women-led MSMEs, development partners, traditional authorities and civil society. Ensuring effective implementation requires addressing critical questions, including:

i. What specific actions will be undertaken to translate policy into concrete practices?

ii. What obstacles could potentially hinder policy implementation?

iii. What is a realistic time frame for achieving policy goals?

Priority areas

Priority 1: Agriculture Productivity, Processing, Nutrition and Commercialisation

Discussions centred on expanding Priority Area (PA) 1 to move beyond a singular focus on agricultural productivity to a multi-sectoral approach that integrates healthcare, arts, mining, tourism, industrial development and urbanisation. This revised PA would also have the flexibility to address emerging issues as they arise.

A proposed Key Performance Area (KPA) under a broadened PA is 'Enhancing Industrial Productivity.' This KPA would encompass Priority Areas 1, 2, 3, 4 and 6, potentially streamlining policy implementation. However, while this approach offers adaptability for future challenges, concerns were raised about:

i. The current framework lacking a clear mechanism for securing funding to translate the policy into action.

ii. The policy not adequately addressing how to bridge the gap between innovation and commercialization.

Suggestions made included:

» Establishment of Innovation Management and Commercialisation as a Cross-Cutting Priority Area, covering the development, transfer and diffusion of innovations.

» Creation of policies mandating government contributions towards an STI Fund, with each sector that receives funds contributing proportionally.

» Introduction of a priority area addressing market access, investment and resourcing for STI.

» Inclusion of a 'Human Capital Development' priority area tailored to industry-specific skills required for STI.

» A dedicated Key Performance Area for policy communication, engagement and advocacy.

Priority 2: Enhancing Industrialization

Discussions emphasised the need for enhanced coordination between the new policy and other relevant sectors, for which stakeholder engagement is crucial. Consultations must be expanded to include a wider range of participants to define specific roles for the various stakeholders in order to foster collaboration across sectors. Securing funding to support these coordination efforts is vital. It was suggested that Policy Statement 1 for Priority Area 2 be revised to reflect this focus on collaboration. The concept of an STI levy as a potential funding mechanism was introduced. Identifying a central body to lead and guide this coordination is necessary to ensure its effectiveness.

For Priority Area 2, there was concern Technical, Entrepreneurial and Vocational Education and Training (TEVET) institutions are underutilised. Malawi University of Business and Applied Sciences (MUBAS), formerly known as a Polytechnic, was offered as an example of the potential of these institutions to not just drive STI but also to fundamentally contribute to industrial research. A proposal was made to establish a National Industrial Research, Technology and Innovation Centre to facilitate the integration of TEVET and STI start-ups, and to engage the private sector in research activities, contributing to the implementation of the country's National Research Agenda. A priority area on Research, Data and Learning Systems for STI Development was also proposed.

The need for robust advocacy and communication efforts was also identified. It is essential to ensure that all stakeholders, as a living and dynamic ecosystem, understand their roles and responsibilities within the STI framework for successful policy implementation.

It was recognised that STI policy must be coordinated with curriculum reviews at all education levels and institutions. This integration will ensure that future generations are equipped with the necessary STEM skills to thrive in the rapidly evolving global STI landscape. To this end, various stakeholders participated actively in the national curricula consultative meetings and the National Education Conference on Curricula Change and Innovation in April 2024.

Priority 3: Economic Infrastructure Development

Discussion centred on harnessing science, technology and innovation (STI) to drive Malawi's economic infrastructure. There was recognition that the verb 'promote' is both vague and overused in the policy statement and its corresponding strategies. To address this, participants brainstormed specific action proposals to achieve the desired outcomes. Examples included integrating bio-diesel into the national renewable energy mix, prioritising energy efficiency initiatives, and developing a comprehensive strategy for securing raw materials for ethanol production. It was also proposed that the priority area be renamed "STI infrastructure development and Infrastructure Development for STI" to ensure focus on the development of critical infrastructure to support STI infrastructure, thereby strengthening the nation's STI capability and fostering overall growth and development.

Priority 4: Urbanisation

Priority 4 emphasises the importance of main-streaming STI across sectors in Malawi. The discussion focused on the vital link between STI and infrastructure development. The policy should not only ensure the integration of STI into infrastructure projects, but also guarantee that infrastructure development actively promote and support STI initiatives. Beyond these core areas, suggestions included:

i. Develop robust strategies to facilitate market access and attract investment for STI initiatives to foster innovation and commercialisation. It was suggested that a priority area on Market Access, Investment and Resourcing for STI be included.

ii. Invest in developing a skilled workforce that is equipped for the STI landscape (see priority area on Human Capital Development).

iii. Implement strong governance, effective coordination across stakeholders, and clear strategic and passionate leadership. Include a priority area on Governance, Risk Management, Coordination and Strategic Leadership in STI.

iv. Address cross-cutting issues and incorporate STI priority areas in Climate Change Mitigation and Promotion of Environmental Sustainability, Gender Mainstreaming in the STI Sector and STI Policies, and Research

Priority 5: Human Capital Development

Human capital development is a cornerstone for the success of the new Science, Technology and Innovation (STI) policy, and is aligned with the aspirations of the Malawi 2063 Vision. However, critical gaps require attention to ensure a comprehensive approach:

i. The current curriculum lacks sufficient focus on STEM in general, and STI in particular. A thorough review is needed to align educational content with the latest international STI standards.

ii. To ensure Malawian researchers are globally competitive, a clear plan for benchmarking research standards must be established, to include defined criteria, a dedicated body to oversee the process and a system for continuous improvement, in alignment with the National Research Agenda.

The policy statement's focus on Higher Education Institutions (HEIs) as the sole source of STI human capital was challenged, arguing that researchers and innovators exist across various sectors and social strata, not just in academia. For this reason, it was recommended that the policy facilitate participation of talent wherever it comes from, and acknowledge and incentivise individual and collaborative contributions. Public awareness about STI-related research, development and innovation opportunities must be raised strategically in order to encourage more people to pursue careers in STI. Incentives for researchers and scientists are necessary to propel Malawi's economic development and growth. A clear funding plan must be based on policy that outlines specific funding sources and strategies to ensure long-term financial sustainability of STI initiatives. Benchmarking HEI and industry linkages, including supporting frameworks, is essential. Understanding these relationships will contribute to the development of policy that strengthens the connection between academia and industry, ensuring graduates have the knowledge and skills in demand by employers.

Priority Area 6: Climate Change Mitigation and Promotion of Environmental Sustainability

Malawi's new STI policy recognises the critical environmental challenges facing the country. The policy proposes addressing them as follows:

1. Climate Change Mitigation

i. **Develop Climate Adaptation Technologies:** Develop innovative technologies to help Malawians and Malawian institutions adapt to the impacts of climate change.

ii. **Build Capacity for Climate Monitoring:** Enhance capacity for climate monitoring and early warning systems even at the institution level, like schools. This will facilitate informed decision-making and proactive response to climate threats and shocks.

iii. **Launch Public Awareness Campaigns:** Raise public awareness about climate change mitigation and adaptation measures to change behaviour and encourage community-driven solutions and climate smart education.

iv. **Mainstream Climate Action:** Integrate climate change considerations into national development processes using STI and using STI solutions in national and institutional disaster preparedness and response policies and strategies. This will leverage scientific advancements and innovative solutions to address climate-related challenges and will enhance resilience against disasters.

v. **Integrate Climate Education:** Revise educational curricula at all levels to incorporate STI approaches to climate change and environmental sustainability. This gives students the opportunity to learn about and engage with topics such as renewable energy, environmental conservation technologies, climate change adaptation and mitigation strategies. It will also equip students with the knowledge and skills needed to address contemporary environmental challenges effectively through innovative and scientifically-informed approaches.

2. Environmental Sustainability

i. **Comply with Environmental Safeguards:** Ensure compliance with established environmental management plans in research, development and innovation.

ii. **Incorporate Modern Waste Management:** Modern waste management practices like recycling and composting are essential for environmental sustainability.

iii. **Strengthen Environmental Regulations:** A robust STI-informed legal framework is needed to combat pollution by leveraging scientific understanding and innovative solutions within the legal system, thereby promoting environmental protection and sustainability.

Proposal for New Priority Areas in the NSTIP

Recognising the importance of public engagement and the need for a dedicated funding mechanism to support

Priority areas

it, the team proposed two new Priority Areas (PAs) for the STI policy: "***Policy Communication, Engagement and Advocacy for STI,***" and "***Market Access, Investment and Resourcing for STI.***" The former would consolidate all policy statements and strategies related to public awareness, communication, stakeholder engagement and policy advocacy across all identified priority areas. The latter would include strategies related to facilitating access to market for commercialised local innovations, investment in policy activities and STI sector development, funding mechanisms for sustainable STI, and domestic resourcing of STI initiatives through public-private partnerships. This will stimulate a more localized and potentially scalable approach to securing resources for STI growth and development in Malawi.

Priority Area 7: Strengthening the Foundation of Malawi's STI Policy (Funding Strategies)

There was recognition that a more robust approach to financing STI initiatives is needed in Malawi. 'Funding of STI' is too vague: concrete strategies outlining how resources will be secured are essential for successful policy implementation. Beyond the critical issue of funding, other

potential initiatives were identified for further development within the policy framework:

i.   Technology Development and Patent Management

ii. Collaboration and Partnerships

iii. National Innovation Database

iv. National STI Directory

Online participants urged that policy should be more inclusive, and that the definition of innovation encompass not only technological advancements but social and super-low-cost advancements that address local challenges. A participant offered the example of a self-built car to exemplify this broader concept of innovation, and the potential for homegrown solutions. The online community also advocated for better balance between addressing current challenges and fostering long-term economic growth. It was also recognised that open data and open science principles must be integral to the NSTIP using the goals outlined in STISA 2024 in order to foster innovation and drive transformative advancements in STI across the region.

Table I below lists the original Policy Priority Areas presented to workshop participants, and the recommendations that resulted from their review and input:	
ORIGINAL PRIORITY AREA	**REVISED AND AGREED PRIORITY AREA**
Agriculture productivity, processing, nutrition and commercialisation	STI in Growth Sectors (Agriculture, Health, Tourism and Arts, Mining, Industrial Development and Urbanisation)
Enhancing Industrialisation Through Research, Science, Technology and Innovation	STI Infrastructure Development and Infrastructure Development for STI
Economic Infrastructure Development	Market Access, Investment and Resourcing for STI
Urbanisation	Human Capital Development for STI
Human Capital Development	Governance, Risk Management, Coordination and Strategic Leadership in STI
Climate Change and Environmental sustainability	Cross-Cutting Areas a) STI Partnerships and Collaborations b) Policy Communication, Engagement and Advocacy c) Gender Main-streaming in STI Sector and STI Policies d) Research, Data and Learning Systems for STI Development e) Innovation Management and Commercialisation (Development, Transfer and Diffusion of Innovations) f) STI in Climate Change Mitigation and Promotion of Environmental Sustainability
Cross Cutting issues	

African Union's STISA 2034

The African Union Science, Technology and Innovation Strategy for Africa (STISA) is a pivotal component of the long-term vision outlined in the AU Agenda 2063. Its objective is to transition Africa into a knowledge-based, innovation-driven society, emphasising sustainable development and effective implementation of STI pillars at continental, national and regional levels. The African Union's (AU) Science, Technology and Innovation Strategy (STISA) 2024 contributes to achieving the long-term vision of Agenda 2063. Priority areas within the STISA 2024 focus on the sustainable growth of member states. These include hunger eradication, disease prevention, communication infrastructure, space science, societal cohesion and wealth creation.

The distinction between policy and strategy underscores the need to transition from linear models to more implementation-informed strategies. Stakeholders are urged to set broad goals for STI policies while proactively addressing challenges and designing plans for effective implementation. Governance for Artificial Intelligence (AI) include options like assigning oversight to existing ministries, creating new governmental bodies, establishing AI expert advisory groups, and implementing advisory bodies for AI and data ethics.

Data mining informs policy development, implementation and evaluation significantly by utilising data analysis and insights to enhance decision-making. Ethical deliberation, governance and assessment are essential aspects of STI policy to ensure accountability and to safeguard the interests of marginalised groups, emphasising justice, equity and sustainable development in policy implementation. Malawi's ethical transition to AI and the equitable distribution of critical STI resources to benefit its citizens remain central principles to policy formulation and implementation.

Presentation on Gender Considerations in National Science, Technology, and Innovation (STI) Policies

Rethinking national policy frameworks to accelerate gender equality and youth empowerment leveraging Artificial Intelligence: Evidence from COMESA and ECOWAS member countries

Gender inclusivity is fundamental to both the SDGs and Agenda 2063: achieving gender equality and empowering women are embedded in all 17 SDGs. The vision articulated in Agenda 2063 foresees an Africa driven by its people, relying particularly on releasing the potential of its women and youth, aiming for equality in all aspects of life.

Accessibility to AI resources through infrastructure development, appropriate education for various stakeholders and investment in accessible and adoptable innovation are required to foster an inclusive AI environment. Robust monitoring and evaluation mechanisms must be implemented to promote inclusivity.

A study by SFA Foundation and the Human Sciences Research Council (HSRC) identified significant gender gaps in the field of Artificial Intelligence (AI), which poses the risk of exacerbating existing gender inequalities. The study also found a policy and strategy environment for AI in Africa, with limited references to gender, women, and youth in policy documents. For these reasons, the study recommends the development of standardised regional policies and AI regulatory frameworks as well as gender main-streaming instruments with measurable targets. The study encourages multi-stakeholder consultations for both policy development and implementation and synchronization of global policy frameworks with regional and national policies.

In Malawi, challenges include insufficient research infrastructure and a need for increased PhD research funding. Malawi's National Research Agenda for STI development seeks to address these issues. Successful implementation of NSTIP in Malawi hinges on relevance and continuity. This calls for a collaborative approach to develop a clear vision for the NSTIP, addressing critical questions, mapping linkages with existing policies, sequencing tasks on a timeline, consulting with the Cabinet.

Conclusion

The workshop was a productive step towards shaping the new Malawi National Science, Technology, and Innovation Policy (NSTIP). Critical discussions took place spanning a broad spectrum of topics, including harnessing technology for agricultural advancement, mitigating climate change, resourcing research, development and innovation, fostering quality human capital development, and ensuring the inclusionon of women, youth and marginalised populations.

Proposed revisions to the 2002 S&T Policy acknowledge rapid advancements in technology and the need to equip Malawians with the necessary skills to thrive in the 21st Century. To achieve this, the NSTIP must translate into tangible actions with clear timelines based on collaboration across stakeholder groups, including ggovernment, education and training institutions, civil society and the private sector.

The Malawi NSTIP must be built on inclusivity to guarantee fair access to STI opportunities and education, especially for women, young people and rural populations. Vital issues from various stakeholders emerged from the workshop and must be taken into account. With sustained commitment and a well-defined plan, thoughtful policy makers have the opportunity to make the Malawi NSTIP a powerful force, propelling the country and its people into the future of their ambitions and capabilities.

List of Contributors

Name	Institution
Uzma Alam	Science for Africa Foundation.
Phoebe A. Ganola	Science for Africa Foundation.
William Ngwira	Directorate of Science, Technology and Innovation. Malawi.
Chigomezgo Gondwe	Directorate of Science, Technology and Innovation. Malawi.
Chomora Mikeka	Directorate of Science, Technology and Innovation. Malawi.
Joanes Atela	Africa Research Impact Network-Africa.

ScienceforAfricaFoundation