African Union

Science, Technology and Innovation Strategy for Africa STISA 2034

DRIVING AFRICA'S FUTURE

FOREWORD

Ten years ago, Africa ushered in a strategic blueprint and elaborated the plan for building the continent's socio-economic transformation on the solid foundations of science, technology and innovation. STISA 2024 was a byproduct of Agenda 2063 – the generational charter representing Africa's urge for renewal and prosperity. Time has since proven the relevance of the first continental STI strategy as a pioneering framework that has stimulated proactive national strategies across the continent. It has had a positive impact on countries' capacities to collect data, particularly through Research and Development and innovation. The growth in African technology exports and the increase in scientific publications, patents and technology hubs are testimonies to the progress Africa has made in innovation.

Looking back on the journey over the last decade, the continent was actively engaged with the groundwork for fostering an STI-driven development agenda. Our scientists and researchers are keenly involved in intra-African and international collaborative enterprises, and science diplomacy is taking root in the continent's international cooperation. The governance of the Pan African University – a flagship programme of the African Union Commission – was strengthened. The African Outer Space Programme has been set on track, with the election of the African Space Council and the framework for establishing the African Space Agency. It is poised to strengthen the earth observation services being delivered to various consortia of institutions managing natural resources in the continent. The introduction of an African Continental Artificial Intelligence Strategy is equally groundbreaking – with the prospects for integrating an emerging technology to drive transformation across many sectors.

African leaders were forward-looking in conceiving the framework for Agenda 2063 and crafted a pragmatic blueprint designed to address the evolving challenges of the continent. Similarly, the STISA-2024 was formulated for the first implementation decade of the Agenda. As we transition into the second ten-year implementation plan of Agenda 2063, our strategic direction on STI demands updating and alignment with the plan.

This is even more imperative given, on the one hand, the important developments mentioned in the previous paragraph, and on the other, the trajectory of global and regional events in the last ten years. Indeed, from the COVID-19 pandemic to the Russia-Ukraine war and the concrete and deleterious continental impacts of climate change, Africa and the world have had much to contend with and devise solutions for. This new version of STISA was developed bearing in mind this backdrop.

The process of developing the new strategy was as intentional as it was essential. Informed by the insights and suggestions from a consultative review that examined the execution of the earlier STISA, it was an inclusive and broad-based exercise that engaged Member States and other relevant stakeholders. The goal was to set a new and holistic direction for exploiting STI in tackling Africa's challenges whilst fostering growth and competitiveness.

The exercise was deliberate in its choice of sectors, thematic focus areas otherwise referred to in the document as the 'Strategic Priorities' and the proposed mechanisms for funding and governance. It mirrors national and regional priorities – as Agriculture, Health, ICT, Energy, and Environment are central to its sectoral scope. The strategy demonstrates Africa's resolve to industrialize, bolster its infrastructure and further develop its human capabilities. It further shows the continent's resolve to deploy science diplomacy and all types of partnerships to catalyze its socio-economic development.

To pivot the implementation and impact of STISA-2034, engagement and monitoring must remain continuous processes to consolidate buy-in and ownership. There will be a need for building wider inter-governmental and multi-stakeholder support among AU Member States, Regional Economic Communities, academic institutions, civil society-based groups, the private sector and international partners, to realize the objectives of this promising blueprint and the vision for an integrated, prosperous, and peaceful Africa.

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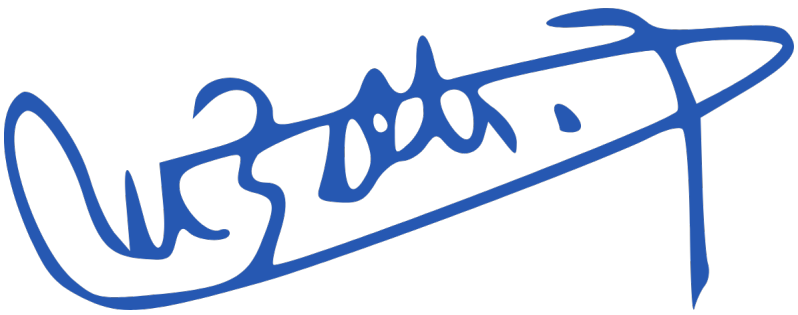

H.E. PROF. MOHAMMED BELHOCINE
Commissioner for Education,
Science, Technology & Innovation
African Union Commission

ACKNOWLEDGEMENTS

The second edition of the Science, Technology and Innovation Strategy for Africa (STISA 2034) is the culmination of a sustained collaboration built on a shared commitment to transforming the continent using science, technology and innovation (STI). It is heart-warming that African experts and policymakers have risen to the common awakening that no meaningful socio-economic development is attainable without the agency of STI. This realization has manifested in the hard work and dedication injected into the production of the STISA 2034. To all the contributors in the process, the African Union Commission extends special gratitude, for responding with their ideas, resources and expertise, in particular, members of the Task Force and the Drafting Team as well as the institutions they represent (annexed). The Commission acknowledges the support of AU Member States towards the process and of AUDA-NEPAD in the drafting exercise and development of the Implementation Plan. The Commission remains indebted to all other individuals and institutions who contributed in one way or the other to the production of the strategy.

The Science, Technology and Innovation Strategy for Africa (STISA 2034) was developed under the visionary leadership of H.E. Prof. Mohammed Belhocine, the African Union's Commissioner for Education, Science, Technology and Innovation (ESTI). Strategic direction was provided by Prof. Saidou Madougou, director for the Education, Science, Technology and Innovation Department, as well as the Head of Science, Technology and Space Division, whose steadfast commitment ensured the realisation of this strategy. We extend our profound gratitude to the members of the Science, Technology and Space division of ESTI for your various efforts on the production of the strategy.

Prof. Saidou Madougou, Director for Education, Science, Technology and Innovation, African Union Commission

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List of Acronyms

AAS	African Academy of Sciences
AfCFTA	African Continental Free Trade Area
AI	Artificial Intelligence
AIDA	Accelerated Industrial Development of Africa
AOSTI	African Observatory for Science, Technology, and Innovation
APET	African Union's High-Level Panel on Emerging Technologies
AUC	African Union Commission
AUDA-NEPAD	African Union Development Agency- New Partnership for Africa's Development
AUFIs	African Union Financial Institutions
CAADP	Comprehensive Africa Agricultural Development Programme
CDC	Centers for Disease Control and Prevention
CESA	Continental Education Strategy for Africa
COVID-19	Coronavirus Disease 2019
DNA	Deoxyribonucleic acid
FMP	Free Movement of Persons
GDP	Gross Domestic Products
GIS	Geographic Information Systems
HIV	Human Immunodeficiency Virus
ICT	Information and Communications Technology
IDRC	International Research Development Center
IEA	International Energy Agency
IK	Indigenous Knowledge
IoTs	Internet of Things
IPCC	Intergovernmental Panel on Climate Change
ISSM	Integrated Soil–crop Systems Management
NGOs	Non-Governmental Organizations
OECD	Organization for Economic Cooperation and Development
PPP	Public-Private Partnership
PRIDA	Policy and Regulatory Initiative for Digital Africa
REC	Regional Economic Communities
R&D	Research and Development
SDGs	Sustainable Development Goals
STC-EST	Specialized Technical Committee on Education, Science and Technology
STEM	Science, Technology, Engineering and Mathematics
STI	Science, Technology and Innovation
STISA	Science, Technology and Innovation Strategy for Africa
STYIP	Second Ten-Year Implementation Plan
TB	Tuberculosis
TVET	Technical and vocational education and training
TWAS	The World Academy of Science
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development.
UNESCO	United Nations Educational, Scientific and Cultural Organization

EXECUTIVE SUMMARY

The past decade has witnessed remarkable changes in Africa and worldwide, characterized by rapid progress in Science, Technology, and Innovation (STI), as well as prospects for economic transformation. These scientific and technological advancements are happening amid socio-economic challenges, including pandemics, increased droughts and water scarcity, loss of biodiversity, disasters and food insecurity among others. Current global trends require the creation of a future that is both digitally and environmentally progressive. This encompasses the transition to sustainable practices, integrating advanced methods in agriculture and energy management, and other relevant areas. It is therefore crucial to position STI as a central element of Africa's developmental ambitions to achieve the goals outlined in the Second Ten-Year Implementation Plan (STYIP) 2024-2033 of Agenda 2063.

The Science, Technology, and Innovation Strategy for Africa (STISA) 2034 boldly continues the global agenda set by previous policies, including STISA 2024, firmly building upon their foundations and accomplishments. It draws clear direction from an extensive examination of the state of STI in Africa, defining a strategy that addresses the continent's developmental realities within the global context. The assessment report of STISA 2024, carried out by the African Union Commission in collaboration with UNESCO in 2023, strongly highlights sluggish implementation due to the absence of dedicated funding mechanisms and instruments, ineffective coordination and governance, inadequate infrastructure, and low research outputs. Even in instances of notable advancements, weak intellectual property frameworks, limited private sector involvement, youth unemployment and persistent gender gaps continue to affect the state of STI in the continent.

A connected, competitive, innovation-focused, knowledge-driven African development is feasible, despite the obstacles. The changing global socio-economic landscape offers fresh prospects to tackle numerous challenges in the continent. Africa has built momentum, and governments are demonstrating dedication to promoting STI. The continent is experiencing a rise in the production and utilization of STIs and improved scientific output, with increasing intra-Africa collaboration, the launch of new continental and national research projects, and the implementation of funding mechanisms.

STISA 2034 adopts a comprehensive approach to STI policies, to ensure effective governance. It addresses food and nutritional security, emergency preparedness, and connecting and integrating Africa. The strategy commits to ensuring access to affordable and reliable energy and confronting biodiversity loss. It responds to the challenges of water scarcity and climate resilience of both economies and communities.

STISA 2034 will serve as a driving force for critical sectors including agriculture, health, ICT, energy and environment. It is crafted for the application of STI for sustainable and inclusive industrialization, use of frontier and emerging technologies as well as human capital and skills development. It further provides orientation for private sector engagement, science diplomacy, and youth and women empowerment. Through the transformative power of science, technology, and innovation, the strategy cultivates the mission of accelerating Africa's transition into a knowledge-based and innovation-driven continent. It contributes to creating an integrated, prosperous, and peaceful Africa, driven by competitive science, technology, and innovation.

The introduction of this ten-year strategy is a call to action for governments, educational institutions, civil society, and the private sector to come together with unyielding resolve to harness the power of STI and unlock the continent's full potential. It accelerates progress toward the ambitious goals of Agenda 2063 and the global Sustainable Development Goals (SDGs).

Through the transformative power of Science, Technology and Innovation the strategy cultivates the mission of accelerating Africa's continent.

1.INTRODUCTION

The visionary strategies that paved the way to unlocking Africa's science, technology and innovation potential, including the Lagos Plan of Action on the Economic Development of Africa (LPA) in 1980, the Consolidated Plan of Action on Science and Technology (CPA) in 2005, and the Science, Technology and Innovation Strategy for Africa (STISA) in 2024, were significant milestones in designing Science, Technology and Innovation (STI) policy in Africa. The latter has been the continental framework for promoting and applying STI to achieve the goals outlined in the African Union (AU) Agenda 2063 – **The Africa We Want.**

Global trends demand the creation of a digitally and ecologically smart future including the green transition, climate change, smart agriculture, and energy. Positioning STI at the heart of Africa's developmental aspirations is crucial for achieving the Second Ten-Year Implementation Plan (STYIP) 2024-2033 of Agenda 2063. Therefore, the 3rd Ordinary Session of the Specialized Technical Committee on Education, Science and Technology (STC-EST) in 2019 called for the review of the implementation of STISA 2024. The STISA 2034 policy context is firmly supported by the key findings of the Review Report, which emphasized the imperative for a systemic approach to policy design, robust governance, science diplomacy, and partnerships. The strategy is designed to implement science, technology, and innovation to promote sustainable and inclusive industrial development, consider frontier and emerging technologies, and enhance the development of human capital and skills. Additionally, it offers guidance for involving the private sector, practising science diplomacy, and empowering youth and women.

STISA 2034 was developed through a consultative process led by a task force and drafting team representing a wide range of STI stakeholders. The strategy is a continuation of the global agenda postulated by previous policies, building on their foundations and achievements. It is illuminated by the outcome and observations of a consultative examination of the state of STI in Africa in the past decade. The strategy is defined by the context and developmental realities of the continent and globally.

It is informed by desired Impact Pathways (Theory of Change) that link Science, Technology and Innovation to sustainable development on the continent and deliver an integrated, prosperous and peaceful Africa, driven by competitive Science, Technology, and Innovation. Sectoral and cross-cutting priorities have been brought under the spotlight, with the identification of strategic actions crucial for Africa to accelerate its socio-economic transformation. An STI governance and functional framework streamlines the roadmap for implementation. STISA 2034 is a concrete commitment to Africa's aspirations, aligned with the UN Decade of Science for Development. It is a rallying call for governments, academia, civil society and the private sector, to unite in harnessing the power of STI to unlock the continent's full potential and accelerate progress towards the ambitious goals of Agenda 2063 and the global Sustainable Development Goals (SDGs).

2. CONTEXTUAL ANALYSIS

Since the adoption of Agenda 2063 and STISA 2024 ten years ago, Africa, and the world at large, have undergone significant changes. Rapid developments in science, technology, and innovation are transforming economies globally. New scientific and technological opportunities and socio-economic challenges have emerged. Climate change and environmental challenges continue to preoccupy the international community – with increased droughts and water scarcity, biodiversity loss, natural disasters, and food insecurity, to name but a few.

The Review Report of STISA 2024, commissioned by the African Union Commission in collaboration with UNESCO, underlines strengths, weaknesses, opportunities and threats that called for attention in developing the STISA 2034. Key findings of the review include:

Slow progress in STISA 2024 implementation due to factors such as poor institutional articulation, absence of a clear theory of change, and insufficient resources.

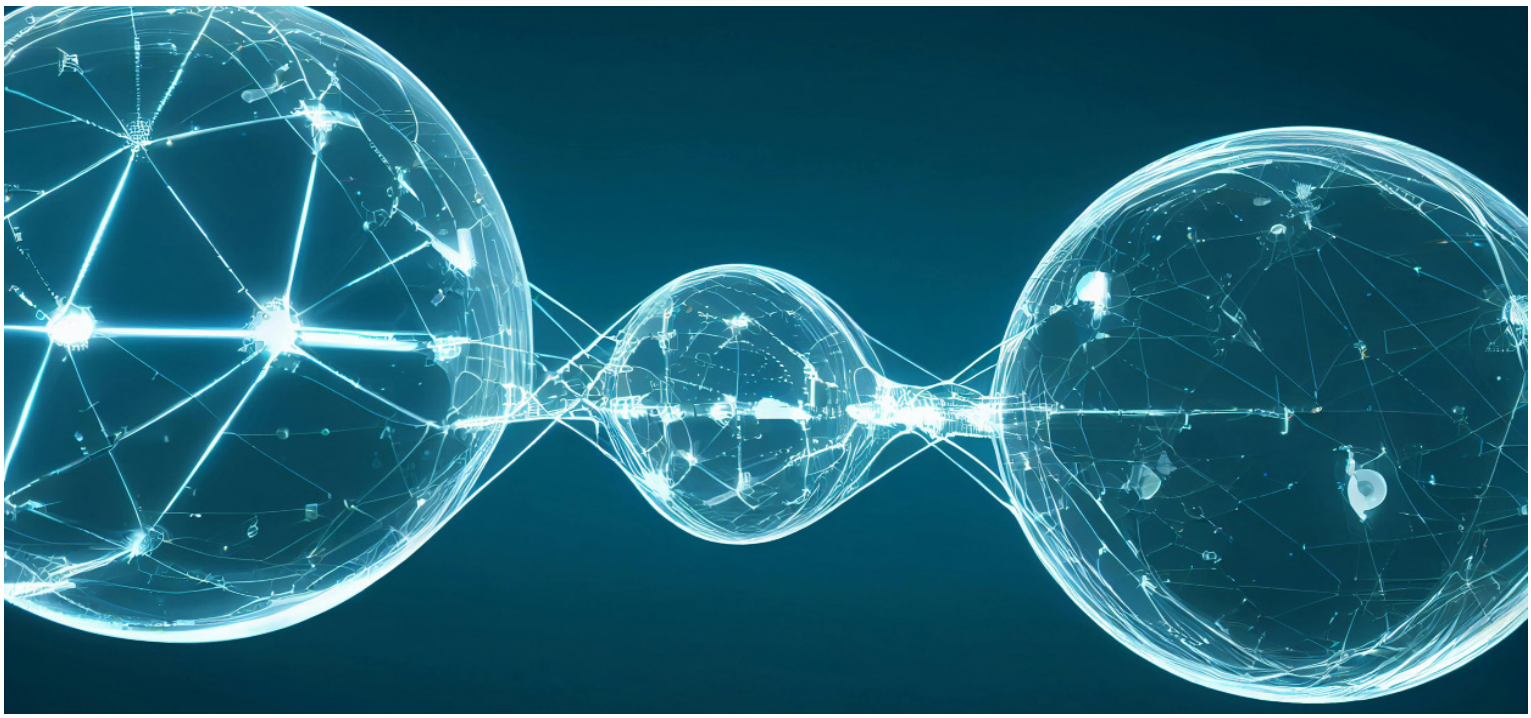
Technocratic and rather top-down design of STISA 2024 that limited ownership and awareness among AU Member States.

Lack of careful consideration of financial and institutional capacities during design and operationalization.

Among Africa's STI weaknesses, the report cited poor infrastructure, limited research capacity, low scientific outputs, and weak intellectual property frameworks. Africa also faces a poly-crisis involving interconnected issues such as debt, climate change, conflicts, and pandemics. These challenges are magnified by gender disparities, low financing, weak coordination and governance, and low private-sector involvement and contribution. Moreover, the UNESCO Science Report 2021 revealed the global representation of women in research stands at a mere 28% across all fields, with only 30% in Science, Technology, Engineering and Mathematics (STEM) related disciplines in Africa. Women in STEM fields often occupy lower positions of responsibility and decision-making, with limited leadership opportunities. They are a minority among engineering and computer science graduates. Similarly, Africa experiences a high level of youth unemployment, leading to elevated poverty rates and societal crises.

Africa's natural endowments represent huge opportunities for positioning STI at the heart of socio-economic development. However, dependency on natural resources is a possible threat to generating the maximum benefit from the continent's STI potential. In the same vein, overreliance on STI resourcing from external sources and distortion of common African priorities could imperil the realization of Africa's Agenda 2063 aspirations.

Despite these challenges, there is potential for an integrated, competitive, innovation-driven, knowledge-based African development. The evolving global socio-economic context presents new opportunities to address many of Africa's challenges. The African Union has signed treaties, agreements and protocols, and developed strategies to guide the



continent towards realizing Agenda 2063 and the SDGs.The strategy enhances and builds upon existing frameworks and initiatives, such as the African Union's High-Level Panel on Emerging Technologies (APET), the African Observatory for Science, Technology, and Innovation (AOSTI), the African Space Agency, the Policy and Regulatory Initiative for Digital Africa (PRIDA), the African Continental Free Trade Area (AfCFTA), the Free Movement of Persons (FMP), and the African Union Financial Institutions (AUFIs). In conjunction with efforts from the Regional Economic Communities, entrepreneurship support organizations, government bodies, development agencies, foundations, the private sector, and academic institutions, these initiatives will collectively drive current progress in STI across the continent.

With collaborative action by the Regional Economic Communities (RECs), governments, development agencies, NGOs, business enterprises, academia and African diaspora ,the strategic initiatives will drive progress in STI across Africa. At the global level, the UN Technology Bank supports African countries in developing technology roadmaps. At the same time, the International Decade of Sciences for Sustainable Development 2024-2033 provides a global framework to advance scientific collaboration for the benefit of all scientists and societies in all regions with a specific focus on Africa. The universal movement towards open science, framed by the 2021 UNESCO Recommendation on Open Science, can make both the products and process of science more accessible, transparent, inclusive and collaborative.

Africa's diverse land and ocean resources, along with a potentially huge market of nearly 1.5 billion inhabitants, represent invaluable opportunities for the continent to take advantage of and harness STI. An increase in development partners, global partnerships engaged in STI, rapid advancements in science and new technologies are good signs for the continent coupled with access to data and technology, these offer opportunities to transform Africa's natural resources, including its youthful human capital, into products and services supporting socio-economic development. Africa is part of the ongoing global technology advancements changing businesses, industries, and everyday lives. These include Artificial Intelligence (AI), blockchain, Internet of Things (IoT), 5G technology, big data management, quantum sciences, augmented reality, virtual reality, renewable energy, nanotechnology, and space exploration technologies, among others. Harnessing such an array of possibilities requires a highly STI-qualified workforce of critical mass including women and the youth of Africa.

Africa has put up a valuable foundation for STISA 2034.There is a political commitment to STI by African governments. There is increased use of STI and improved scientific productivity in Africa, supported by growing intra-Africa collaboration, the launch of new continental and national research initiatives, and the introduction of national funding mechanisms. This underpins the new direction of STI in the continent and the potential for STI-driven socio-economic growth and development.

3. VISION, MISSION & OBJECTIVES

Vision

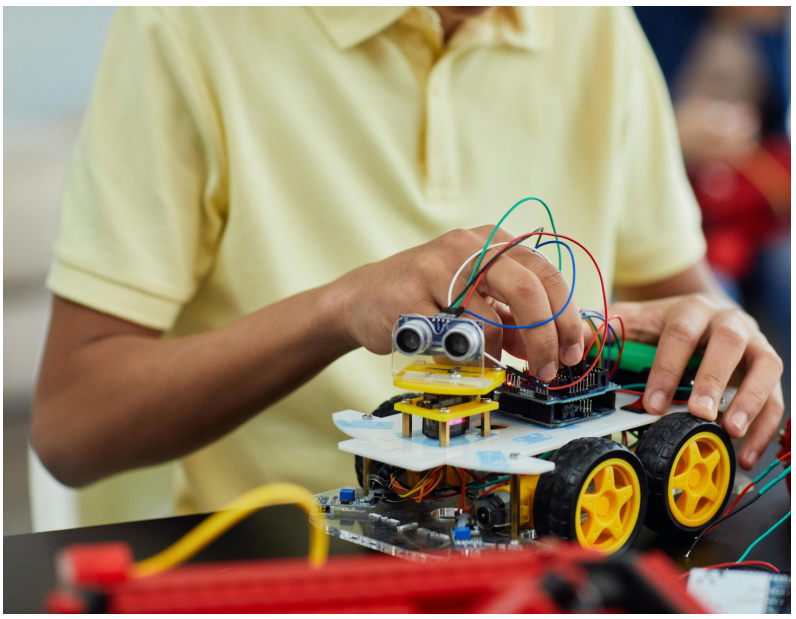
" An integrated, prosperous, and peaceful Africa where science, technology, and innovation drive sustainable socio-economic development. " [1]

Mission

" To harness the transformative power of science, technology, and innovation in accelerating Africa's transition into a knowledge-based and innovation-driven continent".

Objectives

- Promote social well-being and economic competitiveness through fostering innovation, knowledge sharing and scientific collaboration.
- Add value to local and indigenous knowledge for industrial development, entrepreneurship, and job creation.
- Develop human resources in STEM and TVET to enhance infrastructure, institutions and policies, and foster funding, investment and partnerships in STI.
- Engage and empower African youths and women in STI-driven entrepreneurship, particularly in the creation of technology-based small and medium-sized enterprises.
- Strengthen continental STI governance through mobilization and coordination of STI stakeholders.
- Promote and advocate for increased Public-Private Partnerships (PPP) and investments in STI.
- Enhance science literacy and build a culture of science in Africa.



Guiding Principles

- **Political commitment:** Ensure African ownership and visibility of the strategy.
- **Financial sustainability:** Focus on initiatives that are financially sound and sustainable.
- **Relevance:** Relevance of science, technology and innovation based on community needs, foresight and technology assessments.
- **Collective action and inclusivity:** Strategic implementation through collaborative efforts among member states, the private sector, civil society, and marginalized and disadvantaged groups.
- **Excellence and ethics:** Ensure all actions build on scientific excellence and respect ethical standards.
- **Leveraging existing knowledge and resources:** Build on what has been and is being achieved across Africa and ensure sustainability.
- **Diversity, inclusion and equality:** Include and respond to the needs of women and youths in STI.
- **International collaboration and equity:** Africa being assertive and a global player in STI.
- **Adaptability and flexibility:** Ensure flexibility to change the programs as regional needs, conditions and scientific opportunities change.
- **Collective benefit:** Ensure that benefits arising from open science and scientific progress are accessible to all.

1 The AU defines the African diaspora as consisting of people of African origin living outside the continent, irrespective of their citizenship and nationality, and who are willing to contribute to the development and building of the continent.

STISA 2034 will boost the development of intellectual property (IP) frameworks and regulations within Africa, including suppoting continental organs and instruments.

4. IMPACT PATHWAYS

The high-impact sectors and priorities for STISA 2034 are identified based on the continental development agenda. They cover Agriculture, Health, ICT, Energy and the Environment. The intervention areas for STISA 2034 are broadly categorized into strategic priorities in human capital development and STI infrastructure, industrialization, gender and youth involvement, adoptionof frontier and emerging technologies, science diplomacy, and private sector engagement.

It is envisioned that IP governance will serve as an enabling mechanism for boosting innovation in all fields of IP.

The assumptions are the underlying conditions for the actions to achieve the intended outcomes and ultimately make the desired impact of STISA 2034. These assumptions include but are not limited to political and economic stability, absence of pandemic outbreaks and systemic shocks, funding availability, effective risk management, commitment of stakeholders, ethical compliance and collaboration, and partnerships. The strategic actions are interlinked but not linearly mapped into outcomes.

IMPACT

An Intergrated, Prosperous and Peaceful Africa driven by competitive Science, Technology and Innovation

OUTCOMES

Accelerate Africa's transition to a knowledge-based and innovation-led socio-economic development

- **Increased Economic & Inclusive Growth**
- **Enhanced Science Diplomacy & Open Science**
- **Enhanced Human Resource Capabilities**
- **Advanced Technologies Adopted in Priority Areas**
- **Empowered Youth & Jobs Created**
- **Increased Private & Public Investment in R&D**

Priority Sectors

- **Agriculture**
- **Health**
- **ICT**
- **Energy**
- **Environment**

Strategic Priorities & Actions

INDUSTRIALIZATION

Investment in industrial R&D, technology foresight exercises,smart infrastructure for manufacturing, extractive processing and knowledge-driven products/services and continental industrial parks

HUMAN CAPITAL INFRASTUCTURE & SKILLS

Increase financial resources allocated to R&D, investments in STEM and TVET education, upgrade and develop critical R&I infrastructures, promotion of education and culture of science

FRONTIER & EMERGING TECHNOLOGIES

Intensify R&D investments, technology foresight, enhance capabilities, appropriate guidelines, regulatory and governance of frontier and emerging technologies

SCIENCE DIPLOMACY & PARTNERSHIPS

Science attaches to international institutions, AU programme on building capacity in science diplomacy, strengthen R&I partnerships, best practice in equitable STI partnerships and African open science platform

PRIVATE SECTOR ENGAGEMENT

Develop policies, regulations and incentives that strengthen the private sector's role in STI, collaboration and public-private partnerships in STI entrepreneurship and startups, entrepreneurship training programmes

YOUTH & GENDER ENGAGEMENT

Gender specific initiatives, national and institutional policies for women scientists, promoting gender equality and indigenous knowledge to empower African youth and women

ASSUMPTIONS

Political and economic stability, absence of pandemic outbreaks and systemic shocks, funding availability, effective risk management, commitment of stakeholders, ethical compliance and collaborations and partnerships.

5. STI PRIORITY SECTORS

STISA 2034 highlights STI as a critical component for socio-economic development in Africa and as an essential contributor to realizing the Second Ten-Year Implementation Plan (STYIP) of the Agenda 2063. Conceptualizing and formulating STI priority sectors and strategic priorities for STISA 2034 involved stakeholder engagement and a mapping exercise of the STYIP results matrix against STI strengths and opportunities. This led to the identification of five sectors of primary focus for STISA 2034, namely: Agriculture, Health, ICT, Energy, and Environment.

The objectives of STISA 2034 will be achieved within these priority sectors through six cross-cutting Strategic Priorities, namely: (i) STI for Accelerating Sustainable and Inclusive Industrialization; (ii) Building Human Capital, Infrastructure, and Skills; (iii) Building African Capabilities in Frontier and Emerging Technologies; (iv) Strengthening Science Diplomacy and Partnerships in STI; (v) Private Sector Engagement; and (vi) Addressing Youth and Gender Inequalities. The successful implementation of these priorities outlined in section 6, is envisioned to improve Africa's advancement in the sciences, technological development, and innovation to generate job opportunities and stimulate economic growth on the continent.

Agriculture: Addressing Food & Nutritional Security

Africa faces many challenges in its agricultural sectors – encompassing livestock, fisheries, forestry and crops. These challenges hinder the continent's potential for agricultural development and food security. Agriculture is a vital part of the African economy and the daily lives of most Africans, accounting for over 60% of jobs across the continent. Despite this, the sector represents only a quarter of Africa's GDP. Since 1990, African cereal yields have grown by less than 40%, resulting in yields of only 56% of the international average. Public and Private infrastructure for upstream activities like seed and fertilizer distribution, and downstream activities such as dry and cold storage and agro-processing remains underdeveloped. There is a pressing need for African economies to diversify their sources of foreign exchange earnings into less volatile markets such as agricultural commodities and food.

Agriculture is a promising option for this diversification due to its lower price volatility and the continent's substantial undeveloped agricultural resources. The STYIP aims to boost African agricultural productivity by 4%, raising average yields above 4.25 million metric tons per hectare. The Comprehensive Africa Agricultural Development Programme (CAADP) Pillar 4 hinges on improving

agriculture research, technology dissemination and adoption. Component 4 of the 2022 – 2025 CAADP business plan is to support the identification, information sharing and upscaling of the production of highly innovative technologies and innovations. It emphasizes technology deployments to support climate-smart agriculture and increase crop-yield production including enhanced post-harvest management. New biotechnologies like genotyping and marker-assisted selection can accelerate plant breeding, resulting in new crop varieties with desirable traits.

Land and water degradation, along with changing land use patterns in rural areas threaten food security and underscore the need for sustainable management. Optimizing water use in both irrigated and rain-fed conditions, rainwater harvesting, desalination, and sustainable groundwater tapping require STI interventions.

Effective communication of scientific findings to the farmers is essential. Serving the small-scale farmers with STI-based services is guided by the importance of the five 'i's: strengthening of institutions, availability and affordability of improved inputs; expansion of rural infrastructure; incentives for producers; and adequate and timely supply of information to support production and marketing decisions as agricultural production shifts from subsistence to market-led systems.

STI plays a vital role in offering data-driven insights and market trend analysis. Strategic foresight activities, such as horizon scanning to identify situations, are essential for early warning and developing effective responses. Connecting farmers with agricultural research and value chains and fostering better collaboration between universities and agricultural researchers are important necessary steps.

STI Areas of Interventions in the Agriculture Sector

- R&D and innovation in smart agriculture, plant breeding, smart irrigation, precision agriculture, market access, and food processing.
- Develop sustainable tree breeding techniques, and precision forestry using drones and satellite imagery for monitoring and management.
- Develop vaccines and diagnostic tools to combat prevalent livestock diseases.
- R&D for improved crop yields through the development of Integrated Soil–Crop Systems Management (ISSM) and the production of new crop varieties that optimize the inputs and are more resistant to climatic conditions, pests, and disease.
- STI solutions for crop protection against disease, pests, and weeds, including marker-assisted breeding of genetically modified crops with novel resistance genes, and improved mechanization for efficient and affordable machinery to increase productivity.
- Geolocation and mapping services to monitor resource management, increase conservation agriculture and water management, empower farmer organizations, and select suitable sites for dams and irrigation schemes.
- Technologies for biofortification or micronutrient fortification, geoinformation for precision agriculture, food processing, precision nutrition for extracting genetic, microbiome, metabolic data, and blockchain-based traceability to improve food safety and nutrition security.

Health: Ensuring Emergency Preparedness for Healthy Lives And Promoting Nutrition

Africa faces a complex mix of health challenges with major areas of concern being communicable and non-communicable diseases and malnutrition, which put public health systems under constant strain. [1]

The African Health Strategy was developed for the period 2016 – 2030, to strengthen health systems performance, increase investments in health, and improve equity and social determinants of health to reduce priority disease burden by 2030. Africa is still exposed to several threats such as emerging and old epidemics and pandemics, TB, HIV, malaria, and neglected tropical diseases. Despite their decline, the prevalence of these diseases remains well above the global average.

According to the African Regional Nutrition Strategy (2015 - 2025), Africa faces a high level of malnutrition – a cause for concern for the population's physical, mental, cognitive and physiological development. Malnutrition leads to decreased social and economic development and has become an important political and economic development issue.

Considering Africa's transition from the acute phase to the recovery phase of the COVID-19 pandemic, it is important to recognize existing health threats, and the increasing occurrence of climate-related emergencies faced by the continent. To address these challenges, the African CDC Strategic Plan for 2023 – 2027 calls for the establishment of a multi-sectoral response mechanism ensuring adaptability, and interoperability between AU Member States and a One Health approach.

STI Areas of Interventions in the Health Sector

- Expansion of social protection to address equity to achieve universal access to health and social services (including basic primary health care, education, nutrition, and environmental health) through the increased use of information and communication technologies.
- Use essential medicines, commodity security, and supply chain optimization by prioritizing regulation of medical products and technologies to support the availability of quality products.
- R&D of vaccines and therapeutics against emerging threats, and in biopharmaceuticals, exploiting African biodiversity.
- African pandemic and epidemic emergency preparedness, surveillance and response against health disasters using relevant technologies such as advanced biosensors, AI-powered data analysis, mobile health, environmental monitoring for pathogens to predict outbreaks, rapid diagnostic tests, and genomic sequencing platforms.
- Network of centers of excellence in health genomics to promote health research and innovation through the existing institutional mechanisms that define, produce, and utilize African research.
- Medical research, innovation, and health management information systems to improve access to medical technologies and products and develop and retain human resources.

1 The Africa Health Strategy 2016 – 2030

Information & Communication Technology (ICT): Towards an Intergrated & more Connected Africa

Several initiatives have been established for Africa to adapt to the digital economy, including the African Digital Transformation Strategy, adopted by the African Union Summit in 2020, to fully incorporate digital transformation technologies and advanced technological systems into the continent's economy.

The Digital Transformation Strategy for Africa 2020-2030 articulates challenges in the digital divide in Africa. With only 36% of the population connected to the internet, compared to the global average of 67%, over 900 million people are missing out on the benefits of the digital economy. The continent has the largest digital gender gap, with 46% of men using the internet compared to 34% of women. According to the World Bank, globally, approximately 1 in 9 people - just under 850 million individuals - lack official identification. A significant portion of this group, over half, are unregistered children. The majority, around 90%, reside in low-income and lower-middle-income countries, with a substantial proportion – nearly 470 million, living in Africa. These challenges have significant socio-economic implications, hindering access to essential services and financial inclusion.

To create a digitally inclusive Africa, a multifaceted approach focusing on meaningful connectivity, affordability, innovation, effective policy regulation, infrastructure development and skills development is needed. With 70% of Africa's population under the age of 30, it is essential to address the educational attainment gaps and develop digital skills to drive innovation and bridge the digital skills gap. To enhance connectivity, Africa must promote innovation, research and development, empower startups and tech hubs, invest in infrastructure and upskill its workforce. Effective policy and regulatory governance frameworks are equally necessary to foster innovation, protect users, and ensure a digitally inclusive Africa.

> **"With 70% of Africas population under the age of 30, it is essential to address the educational attainment gaps and develop digital skills to drive innovation and bridge skills gap.**

The interplay between Information and Communication Technology (ICT), digitalization, and the digital economy is driving transformative changes globally, including in Africa. ICT serves as the backbone, enabling the development and deployment of digital tools and services. Digitalization, the process of converting information into digital formats, leverages ICT to streamline operations, improve efficiency, and enhance accessibility across sectors. Together, they fuel the growth of the digital economy, where economic activities are increasingly driven by digital technologies, including e-commerce, digital banking, and online services. In African countries, this interplay is particularly significant as it offers pathways to overcome traditional barriers to development. Enhanced ICT infrastructure can bridge the digital divide, providing rural and underserved communities with access to essential services like education, healthcare, and financial inclusion.

STI Areas of Interventions in the ICT Sector

- World-class infrastructure across Africa, through expanded internet connectivity, quality infrastructure and affordable and high-speed internet services.
- Capacity development programmes that drive Africa's sustainable digital economy, leveraging scientific research, innovation, and entrepreneurship to create energy-efficient, climate-friendly ICT systems and infrastructure.
- Implementation of scientific and innovative interventions unique to African settings to guarantee ethical and equitable access to digital tools, data, infrastructure and skills development, focusing on marginalized and underdeveloped regions.
- Strengthening of institutions that support research, development, commercialization, patenting, protection and application of advanced technologies; driving scientific discovery and innovation across Africa and improved regulatory and cybersecurity ecosystems.
- Enhance collaborations between research institutions and technology companies to scale technology innovations that address Africa's challenges; and position Africa as a global technology player, accelerating the deployment of transformative technologies across sectors.
- Promotion of ICT entrepreneurship and innovation by creating a supportive environment that prioritizes research and development in frontier and emerging technologies, fostering a tech ecosystem that produces world-class companies.

Energy: Access to Affordable & Reliable Energy

According to the 2022 Africa Energy Outlook of the International Energy Agency (IEA), about 43% of Africa's population still lacks access to electricity. Africa is striving to balance its immediate need for fossil fuels with a transition to clean energy. Achieving this balance will require the development and wider availability of affordable technologies.

Renewable energy is central to Africa's strategy for tackling its energy challenges. As per the Africa Common Position on Energy Access and Transition of 2019, the continent currently contributes only 2% to global electricity generation. This underscores the vast untapped potential for renewable energy development in Africa, highlighting the urgent need for STI. In 2024, the IEA, under the G20-Research and Innovation Working Group, mapped key technologies relevant to emerging markets and developing economies, revealing minimal participation from African countries. The Agency developed tracking tools to monitor the deployment and maturity of these technologies.

R&D and innovations are crucial for Africa to effectively harness its abundant green energy resources and leapfrog in sustainable development. Direct applications of R&D include improving packaging and cleaning methods for large solar systems and increasing their efficiency. Enhanced R&D resources could enable Africa to establish semiconductor foundries for solar cell manufacturing. In the area of green hydrogen, STI is essential for desalination and hydrogen extraction. Africa's extensive coastline offers significant potential for harnessing blue energy, where STI will be vital.

The continent focuses on decarbonizing the transport sector, which remains a challenge. Renewable energy comprises only 3.7% of total energy consumption, and transport consumes a third of total energy, significantly contributing to emissions. More innovation is needed to decarbonize this sector.

Africa also plays a significant role in energy transition through its green mineral reserves which should be optimized for value addition in downstream processing and manufacturing, particularly in the battery and electric vehicle sectors. However, efforts in this sector are hindered by a lack of necessary skills to build and maintain infrastructure for energy processing and supply.

Africa's energy sector faces a severe funding gap. Within the energy sector, the continent needs $454 billion to contribute to climate change mitigation and an additional $4.5 to $7 billion for adaptation efforts, between 2020 and 2030. Despite the energy poverty, Africa receives a minimal share of global climate finance. Only 3% of global renewable energy funding reached the continent in 2020, hindering efforts to expand energy access due to excessive costs and infrastructure limitations. Significant investments in renewable energy technologies and increased climate finance are urgently required to address this crisis. This funding should be directed towards incentivizing research, development, and innovation in the energy sector to build climate resilience.

STI Areas of Interventions in the Energy Sector

- Technical capacity and skills for manufacturing, installing, operating, and maintaining energy infrastructure.
- The adoption and adaptation of technologies to local needs through robust R&D.
- Manufacturing base for energy equipment and systems in Africa to reduce costs and enable large-scale production.
- Emerging technologies for affordable and reliable green energy and knowledge and information sharing, e.g., through a virtual dashboard on energy transition technologies, based on mapping and profiling of best practices.
- National technology adoption systems, strengthening institutional capacities, and designing financing mechanisms for technology deployment.
- Green hydrogen as part of an African clean and secure energy future.
- Promote STI requirements for a Just Energy Transition.

Environment: Addressing Biodiversity Loss & Water Scarcity & Building the Climate Resilence of Economies & Communities

The potential impact of climate change in Africa remains a concern – in the context of the continent's sustainable development in the coming decades. Scientific evidence shows that human actions are changing the climate. The continent has observed an average warming trend of around +0.3 °C/decade since 1991, higher than the global average of +0.2 °C /decade for the same period (WMO State of the Climate in Africa 2023).This trend may hinder the attainment of middle-income status desired in the STYIP of agenda 2063. For instance, rising temperatures are already causing more malaria cases in some areas and changing farming practices in others, impacting food production, fisheries, fruit trees, health, water, and biodiversity loss. Important influences on biome preservation are linked to private sector activities, including deforestation, mining, and fishing, among others.

Biodiversity loss and water scarcity are among the environmental issues of primary importance for the stability and prosperity of the continent. For Africa, biodiversity is not merely an aesthetic treasure; it is the lifeblood of the continent, underpinning its economy, food security, and overall well-being. By harnessing the potential of STI, the pressing challenge of biodiversity loss in Africa could be addressed. Monitoring and assessment are best fostered through remote sensing and Geographic Information Systems (GIS), DNA barcoding and genetic analysis, precision agriculture, biotechnology, and employing renewable energy technologies. Ecosystem restoration initiatives stand to benefit from innovative approaches offered by STI. Water scarcity, another growing challenge in Africa is exacerbated by climate change. Africa must develop its integrated water resource management systems for balanced human needs and ecological requirements. This is to utilize innovative science and technologies in water harvesting and storage, as well as water treatment and purification.

Continuing change in climate will impact Africa's biodiversity across multiple ties, from intricate realms of genes, through individual species, and up to entire biomes. As climate shifts unfold, the delicate balance of African ecological systems faces disruptions that potentially reshape their fundamental structures and functions.

The AU Climate Change and Resilient Development Strategy and Action Plan 2032 emphasizes that projections of high temperatures and decreased precipitation will impact different regions of Africa in different ways. Therefore, for most countries of Africa where per capita demand for natural resources is fast rising, it is important to integrate scientific applications and develop and mainstream adaptation measures into national development strategies. This is particularly imperative for economies that depend almost entirely on natural resources for growth and sustainability. To ensure that African citizens are more empowered, it is essential to prioritize additional research and innovation that lead to practical solutions for adaptation, mitigation, and the enhancement of climate resilience in economies and communities. This will reduce losses and damages associated with disasters and climate change impacts to 15% maximum of GDP (AU STYIP-2033).

Building climate resilience requires the implementation of robust flood and drought early warning systems. These systems can provide timely and accurate information to communities, helping them prepare for and mitigate the impacts of extreme weather events. This will include utilizing satellite technology, remote sensing, and ground-based observations for data collection and monitoring. It means developing advanced predictive models to forecast the likelihood and severity of these events; establishing efficient communication networks to disseminate warnings and advisories to at-risk communities; and educating communities on interpreting warnings and implementing safety measures. The goal is to foster a culture of preparedness and resilience. It also involves data collection and monitoring, predictive modelling, communication networks, and community training and engagement.

STI Areas of Interventions in the Environment Sector

1. Research and innovation that prioritizes the development of adaptive and mitigation measures to drive sustainable solutions and resilience in all sectors.
2. Digital data and information for environmental monitoring, informed decision-making and global cooperation.
3. Climate change, water and biodiversity knowledge management systems, and learning to foster innovation and competitiveness in all sectors.
4. Sciences for early warning systems, emergency preparedness, and response capacities to enhance the resilience of communities and biodiversity conservation and utilization.
5. Innovative technologies for climate-smart agriculture, biodiversity conservation and utilisation, and water, energy, and healthcare resilience.
6. Developing advanced predictive models to forecast the likelihood and severity of extreme weather events, water scarcity, and biodiversity losses.

6. STRATEGIC PRIORITIES

STISA 2034 is anchored by six interconnected strategic priorities vital for Africa's scientific and technological transformation. By fostering innovation, economic growth, and social development, these priorities will position Africa as a knowledge-based economy:

- Accelerating Sustainable and Inclusive Industrialization
- Building Human Capital, Infrastructure, and Skills
- Building African Capabilities in Frontier and Emerging Technologies
- Strengthening Science Diplomacy and Partnerships
- Private Sector Engagement
- Addressing Inequalities for Youth and Gender

Accelerating Sustainable & Inclusive Industrialization

Industrialization is a cornerstone for Africa's economic transformation. Building on the foundation laid by the Plan of Action for the Accelerated Industrial Development of Africa (AIDA), the continent seeks to leverage STI to catalyze its industrial growth. By shifting towards high-value, technology-intensive production, Africa can create sustainable jobs, reduce reliance on commodities, and improve living standards. This industrial transformation is essential for achieving the Sustainable Development Goals (SDGs) and Agenda 2063.

To accelerate this process, it is necessary to make significant investments in industrial R&D and innovation. Science, technology, and innovation are critical to accelerating Africa's industrialization. This is explicitly recognized in STYIP. To achieve at least a 6% GDP growth rate by 2033, Africa must increase its investment in R&D and innovation.

Objectives

The overall objective of this priority is to boost Africa's industrial potential by developing and utilizing cutting-edge technologies to improve productivity and create jobs across various sectors through the following operational objectives:

- Increase industrial R&D and innovation expenditure.
- Enforce standards and quality assurance and strengthen continental intellectual property governance to protect and facilitate innovation.
- Strengthen technical capabilities in emerging and deep technologies and computational sciences for the Fourth Industrial Revolution and beyond – including AI, robotics, IoT, automation, and smart manufacturing, to optimize productivity.
- Invest in open science.

Actions

- Increase investments in open science, digitalization and industrial research and development, boost the share of high technology products in manufactured exports to 20%, and increase the contribution of digital services to 6% of GDP.
- Develop tools for technology assessment and technology foresight exercises to assist countries in identifying and developing critical technologies to boost efficiency and quality of production.
- Establish world-class and disruptive smart infrastructure for manufacturing, extractive processing and knowledge-driven products and services.
- Establish continental industrial parks and encourage tax incentives and incubator programmes to stimulate the emergence and growth of the entrepreneurship ecosystem.

Building Human Capital, Infrastructure & Skills

Shortage of human skills and weak infrastructure undermine Africa's performance in STI. Critical skills and infrastructure for R&D and innovation in fields such as bioinformatics, Artificial Intelligence (AI), Internet ofThings (IoT), basic and computational sciences as well as humanities are needed to address pressing challenges in all sectors. Such skills are required especially in agriculture, health, manufacturing, energy, transport, and communications. This is well recognized in many African national, regional, and continental policy frameworks. The continent should build critical skills and infrastructure for STI to attain its Agenda 2063 aspirations and the SDGs. The human capital development component of this priority area aligns with the Continental Education Strategy for Africa (CESA) and the TVET Strategy for Africa.

Objectives

The strategic objective is to strengthen the digital and technological infrastructure and human resource development to better implement sector programmes. To achieve this, the following operational objectives are targeted:

- Boost funding support for skills development in R&D and innovation.
- Modernize research infrastructure by upgrading outdated facilities and developing new ones in cutting-edge scientific fields and technologies.
- Enhance STEM education and science literacy across the continent.

Actions

- Increase financial resources allocated to R&D, innovation, and skills development.
- Increase investments in STEM and TVET education with particular focus on women and youth
- Upgrade and develop critical R&I infrastructure, targeting shared infrastructure at all levels.
- Conduct and support the promotion of education and a strong culture of science.

Building African Capabilities in Frontier and Emerging Technologies

At the intersection of radical scientific breakthroughs and technological applications, frontier and emerging technologies are changing human lives, economies and firms in very uncertain and disruptive ways. They include technologies such as Artificial intelligence (AI), Big data, Internet of Things (IoT), 3D printing and the Metaverse. These are transforming communication, innovation in various sectors and the way business is conducted around the world. They influence how we communicate, innovate, and create. They offer new opportunities to address global challenges such as food insecurity, and diseases (e.g., cancer). Some frontier and emerging technologies may pose social, economic, and environmental risks. According to a UNCTAD Technology and Innovation Report (2023), the global market for frontier challenges was estimated to be worth USD 350 billion in 2023 and is expected to grow beyond USD 3.2 trillion by 2025. The report has identified 17 frontier and green technologies, projected to have a market value exceeding $9.5 trillion by 2030.

Africa needs to invest effectively in frontier and emerging technologies to maximize benefits and address any potential risks. The industrialization of Africa's economies and the transition to middle-income economic status will depend on wise investments in frontier and emerging technologies. Collective actions and pooling of resources will ensure that Africa exploits economies of scale and mobilizes existing scientific and technological capabilities to derive optimum benefits from frontier and emerging technologies.

Objectives

The overall objective of this priority is to foster innovation and research in addressing priority sectors by applying advanced technologies through the following operational objectives:

- Build capabilities for data collection and conducting technology foresight and technology assessment to inform decision-making, including setting priorities on frontier and emerging technologies.
- Develop flagship programmes and centers of excellence dedicated to priority frontier and emerging technologies.

Actions

To reach these objectives, the following actions will be carried out:

- Develop and offer training courses on technology foresight and technology assessments.
- Enhance capabilities in activities associated with technology assessment and foresighting.
- Develop appropriate guidelines and regulatory regimes for effective governance of frontier and emerging technologies.
- Support flagship programmes in frontier and emerging technologies.
- Engage with international organizations and countries to share best practices and access advanced technologies.
- Strengthen specialized centers for advanced research and training in scientific and technological fields.
- Ensure ongoing training and upskilling of the workforce in emerging technologies.

Strengthening Science Diplomacy & Partnerships

Science diplomacy and partnerships are critical in strengthening STI ecosystems in Africa and enhancing the continent's participation in international negotiations on global issues such as climate change, biosafety, and innovative technologies, including Artificial Intelligence. Providing scientific advice to inform and support decision-making on foreign policy in forums such as the UN and the G20 is a forte of science diplomacy. The other dimension is the use of diplomacy and partnerships to build nations' scientific capacities and promote technology transfer.

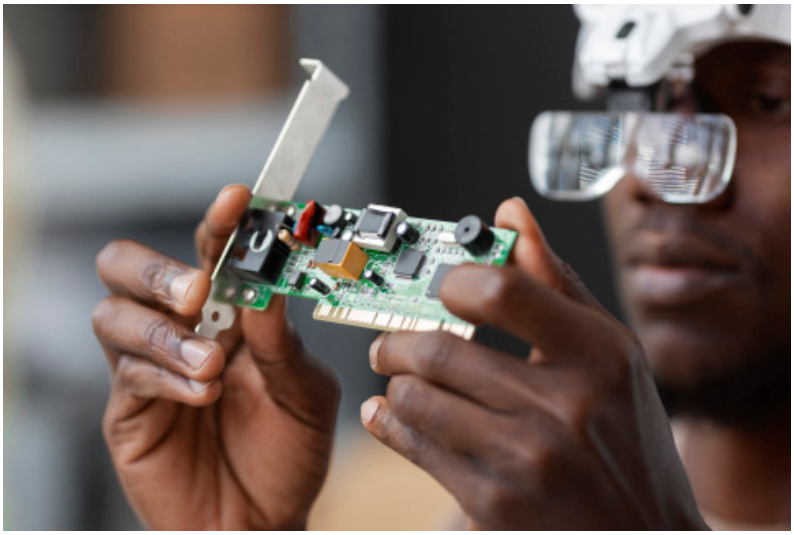
Over the past two decades, Africa has increased its attention on science diplomacy and partnerships with different continents and countries. Recently, the AU has created prospects for cooperation and collaboration on STI with many partners, including Argentina, Brazil, China, EU, Germany, Italy, Japan, Korea, Russia, Türkiye, Canada, and Sweden. Africa participates in the G20 and G7 where STI policy issues are high on the agenda. There are initiatives such as the Science Diplomacy Capital in South Africa, including its Academy of Science for Developing Countries, and the African Academy of Sciences (AAS) capacity development in leveraging scientific expertise to strengthen science diplomacy capacities in African countries. These efforts should be strengthened by a more comprehensive AU programme on building capacities in science diplomacy and STI partnerships.

The effectiveness of STISA 2034 depends on strong intra-African and wider international collaboration and partnerships. The Science Granting Council's Initiative led by the International Research Development Center (IDRC), fosters intra-African research collaboration among 17 African countries. Some examples include joint research by Ghana and Zambia on integrating gender equality in research, bilateral collaborative research on climate-smart technology between Cote d'Ivoire and Mozambique, and health and environment projects between Senegal and Burkina Faso. These partnerships need to build on the principles of open science and promote more equitable, transdisciplinary, and inclusive approaches. Intra-Africa partnerships are critical for exploiting economies of scale (e.g., sharing R&D infrastructure). There are very few intra-African STI partnerships, which undermines the continent's ability to develop large-scale research and innovation initiatives. Under STISA 2034, Africa will seek to strengthen STI partnerships within and between RECs as well as bilateral country collaborations on specific R&I initiatives.

Objectives

The strategic objective of this priority is to promote knowledge and technology, to ensure informed policy-making and intra-Africa and international partnership and collaboration. This objective is broken down as follows:

- Strengthen Africa's voice and participation in international negotiations and policy development processes, e.g., on the SDGs and security, by procuring and using science.
- Enhance the continent's abilities to use its diplomatic capacities and partnerships to strengthen its STI ecosystem.
- Increase and strengthen Research & Innovation partnerships involving African scientists and institutions in international STI programmes.
- Accelerate the transition to open science across the continent.



Actions

- Advocate for Member States to establish science and innovation attachés in their diplomatic offices.
- Explore ways and means to establish science attachés and posts in all multilateral and key international institutions.
- Foster the development of science diplomacy and capacity-building programmes.
- Develop guidelines for best practices in equitable STI partnerships.
- Provide support for the implementation of open science practices across disciplines and communities of practice.
- Advocate for AU Member States' and science communities' active engagement in the implementation of the UN International Decade of Sciences for Sustainable Development.
- Promote an African Open Science Platform.

"The use of diplomacy and partnerships to build nations' Scientific capacities and promote Technology transfer is critical in strengthening STI ecosystems in Africa.

Private Sector Engagement

The private sector plays a significant role in advancing STI. It invests in R&D, technology development and innovation activities. In most industrialized economies, the private sector accounts for at least 50% of R&D investments. In 2022, the private sector's financial contribution to research and innovation in countries of the Organization for Economic Cooperation and Development (OECD) was higher than that of governments or the public sector (OECD, 2023).

The role of Public-Private Partnerships in research and innovation was vividly demonstrated during the COVID-19 pandemic. This partnership produced a wide range of solutions for health emergencies. For example, the pharmaceutical industry launched hundreds of clinical trials and developed COVID-19 drugs and vaccines.

In Africa, there is limited information on the private sector's engagement in STI. The STISA 2024 Review Report revealed that the number of start-ups as well as patent applications in the continent has increased. Meanwhile, some African countries have developed mechanisms for private sector R&D tax incentives, despite the overall investment levels remaining low. It is necessary to create the conditions for stimulating innovative business enterprises and developing a framework for skills and technology transfer. These conditions will attract foreign intellectual capital and foreign direct investment. In addition, efforts must be made to promote the engagement of broader society, including citizens, indigenous and traditional knowledge holders and marginalized communities.

Objectives

The overall objective of this priority is to engage the private sector in advancing technological innovations for priority sectors' development and to strengthen connections between training and development policies. For that to happen, the following operational objectives are identified:

- Strengthen collaboration between the private sector, government, academia and research institutions.
- Promote engagement of the private sector in the co-creation of R&D agenda for socio-economic development.
- Strengthen and promote innovative private entrepreneurship by facilitating access to financing, knowledge and technology for private companies.

Actions

- Advocate for AU Member States to develop policies, regulations and incentives that strengthen the private sector's role in STI.
- Foster collaboration between the private sector, government, academia and research institutions using project funding and other mechanisms.
- Conceptualize and implement entrepreneurship training programmes for scientists.
- Promote public-private partnerships for the sharing of costs, risks and rewards to better reassure private actors.
- Promote private sector investment in STI entrepreneurship and startups.

Addressing Youth & Gender Inequalities

Around 60% of Africa's population is under 25, with more than a third in the productive age range of 15 to 34. By 2100, Africa's youth population is expected to grow by 181.4%, resulting in the youngest population globally, with a median age of 35. Despite this potential, widespread youth unemployment is a significant challenge, with projections indicating that over 263 million young people may be economically vulnerable by 2025. Recognizing Africa's unique demographic structure, currently housing an estimated 420 million youth, and addressing its challenges is crucial for economic development. Downstream education systems must transform, to improve literacy and numeracy and reduce learning poverty which remains stubbornly high.

In addition, women continue to face substantial barriers in STI. Despite their contributions, only about 30% of researchers in Africa are women, and they are paid less, publish less and do not progress as far in their careers compared to their male counterparts. This is a huge intellectual loss for society and efforts must be made to combat the bias, improve representation, and enhance access to resources for women in STEM. To advance as a continent, Africa must increase the enrolment of women and girls in STEM and enhance their attraction and retention in the sector.

In the global context, Africa's contribution to scientific knowledge is just 2.8%, underscoring the need to address key underlying issues. Significant disparities exist in access to scientific knowledge, technologies, and infrastructure. Marginalized scientists often encounter implicit biases and micro-aggressions, pushing them to the periphery of scientific, economic, and social discourse and driving some out of STEM fields. Eliminating scientific and technological marginalization is crucial for societal growth. Additionally, Africa's indigenous communities, making up 16.3% of the population, generate valuable indigenous knowledge (IK) that holds significant potential for scientific advancements.

The African youth in the diaspora represent a critical force in advancing the continent's STI agenda. These young professionals, scholars, and entrepreneurs possess a wealth of knowledge, skills, and experiences acquired from diverse global contexts. Their contributions are increasingly recognized as essential to Africa's development, particularly in the realms of science, technology, and innovation, which are pivotal for addressing the continent's socio-economic challenges and achieving sustainable development.

One of the key roles of African youth in the diaspora is their ability to bridge the knowledge gap between Africa and the rest of the world. Many of these young individuals have been educated in some of the world's leading institutions and have gained practical experience in advanced technological and scientific environments. They bring this expertise back to Africa, either by returning home or by engaging in collaborative projects. Through knowledge transfer initiatives, they can introduce new technologies, innovative practices, and cutting-edge research methodologies to their home countries, thereby enhancing local capacities and fostering an environment conducive to innovation.

Objectives

The main objective of this priority is to encourage and strengthen the active presence of women, young people and vulnerable groups in research and technological innovation initiatives and programmes, through the following operational objectives:

- Leverage African youth, including those in the diaspora, for scientific development and innovation and promote gender equality in STI.
- Increase opportunities for youth, women and vulnerable groups to access STEM education, higher education and technology through scholarships, grants, and vocational training programs.
- Promote collaboration through youth networks and industry partnerships, supporting research opportunities, and recognizing young researchers.

Actions

- Promote gender-specific research for critical areas such as health and the development of gender-friendly technologies.
- Develop initiatives to dismantle gender stereotypes and biases in science.
- Develop national and institutional policies that create workplace environments that attract, retain and advance women scientists.
- Recognize and promote the work of marginalized scientists, as well as nominate them for leadership positions and awards.
- Develop inclusive policies promoting gender equality and integrating indigenous knowledge to empower African youth and women to lead scientific and technological advancements.
- Promote the use of champions and mentorship of women in STEM.

7. Governance

The governance of STISA 2034 will adhere to the rules and procedures set forth by the African Union for decision-making. The AUC, AU specialized technical offices, agencies and organs, as well as all partners involved in science, technology and innovation will be responsible for executing the implementation.

Decision-making & Governance Structure

- **African Heads of State and Government (AU Assembly)** has the authority to demonstrate the collective political will of the African continent to prioritise STI for development on the continent. The political commitment of the Assembly will support and popularize the integration of STISA 2034 into national, regional and continental development programmes and frameworks by ensuring adequate budgetary allocation.
- **Executive Council** will build on the AU Assembly's adoption to help ensure continental-wide coordination through engagement of the Specialized Technical Committee on Education, Science and Technology for onward adoption by the Heads of State. The Executive Council will deliberate on the programmes and propose budget allocation for the activities of STISA 2034 to the Assembly.
- **Specialized Technical Committee on Education, Science, Technology and Innovation (STC-EST)** comprises Ministers in charge of Education, Science, Technology and Innovation in the continent. The STC elaborates, adopts and monitors implementation of the Strategy. The Committee reports and makes recommendations to the AU policy organs on implementation of initiatives, programmes and policies under education, science and technology.

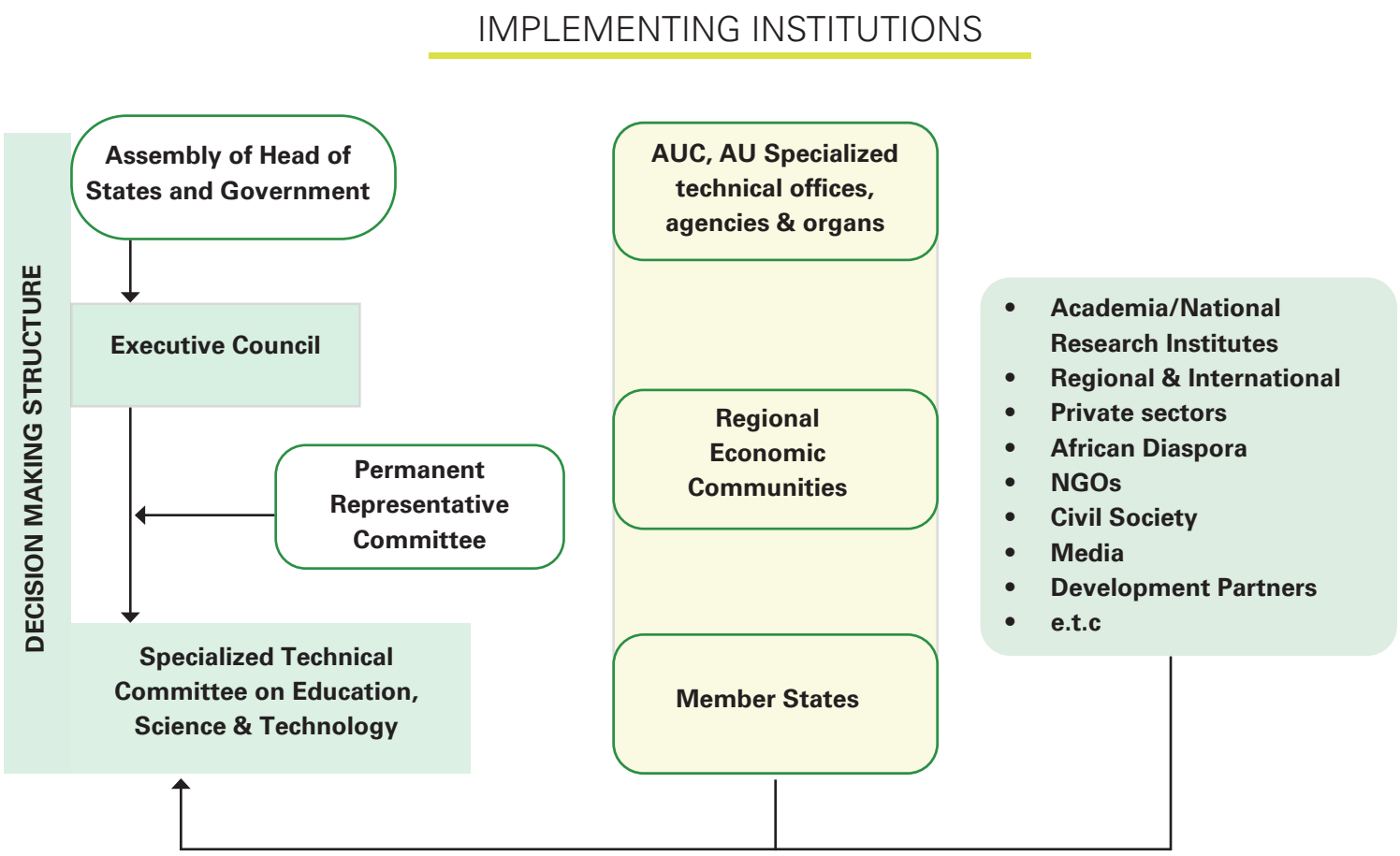
Implementing Bodies

- **The AUC, AU specialized technical offices, agencies and organs** have the following roles in line with their specific mandates: (a) convening meetings of the STC-EST and ensuring that resolutions of such meetings are transmitted to the AU Summits; (b) initiating policy processes aimed at addressing specific science, technology and innovation issues; (c) representing and defending the interests of the AU at international fora and negotiations related to science, technology and innovation; (d) creating various avenues for advocacy and promoting STISA 2034; (f) advocating for and raising awareness on STISA and STC-EST decisions related to STI and ensuring implementation; (g) engaging the RECs in coordinating and harmonizing policies and initiatives; and (h) overseeing and tracking the implementation of the strategy and its monitoring and evaluation.

- **Regional Economic Communities** will develop and implement common programs and projects aligning regional STI plans to STISA 2034, integrating the Strategy in their sectoral development plans, and coordinating implementation at the regional level. They will also coordinate with the AUC and AUDA-NEPAD in the implementation of the Strategy and submit implementation status reports biennially to the STC-EST.

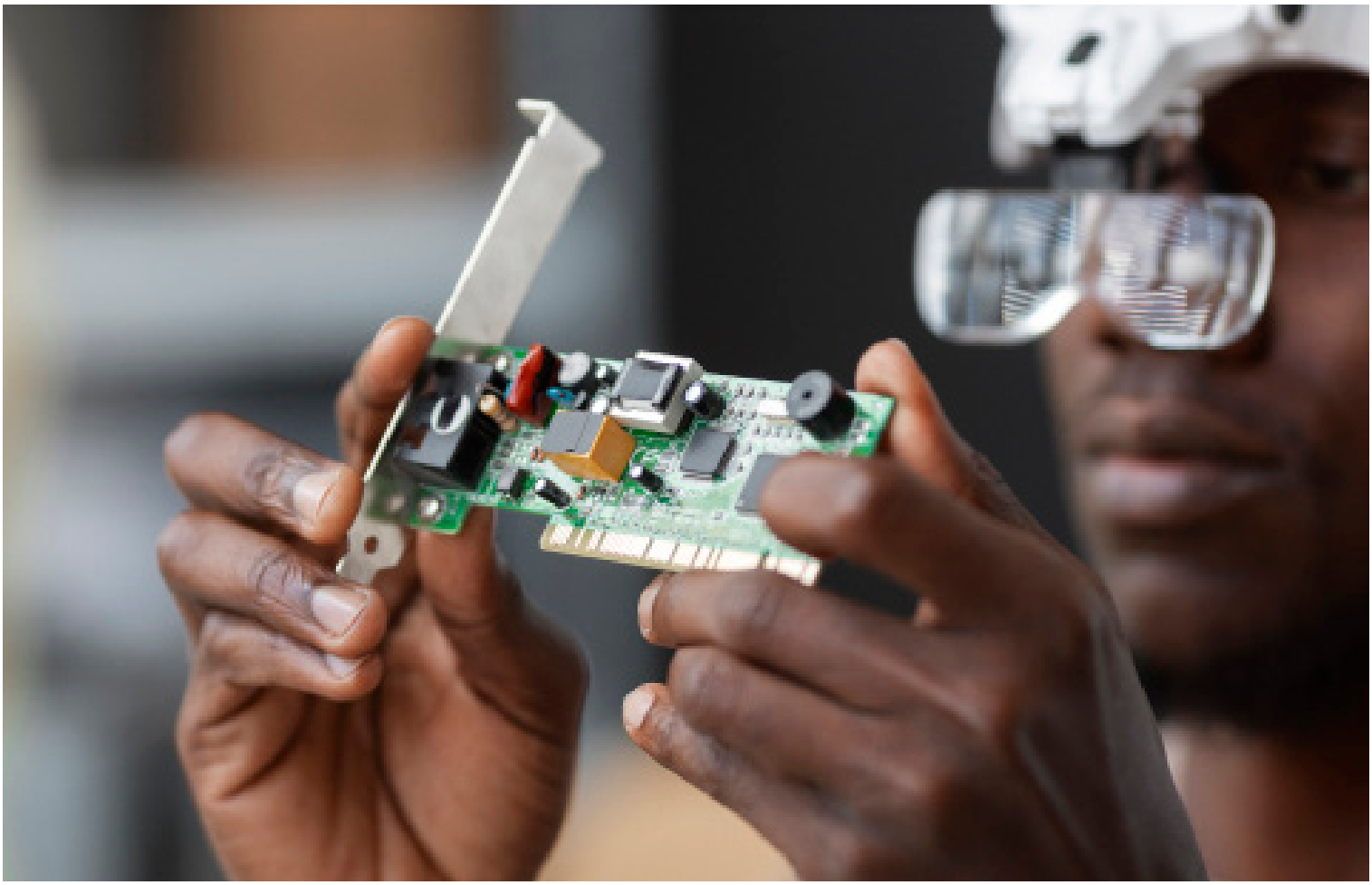
- **AU Member States** will adapt and implement STISA in their national contexts. Member States should use the continental strategy as an STI tool for the implementation of the Agenda 2063 Second Ten-Year Implementation Plan and mobilize funds for its implementation at the country level.

- **STI Stakeholders** academia, national, regional, continental and international STI institutions, the private sector, and the African diaspora including civil society organizations, the media and development partner institutions, will support the implementation of the STISA 2034 at all levels by aligning their programmes, promoting mutual exchanges and providing financial and technical support to implement this Strategy. They will also play an important role in popularizing the STISA 2034 and the importance of innovation in Africa's development.



Foundations of Best Practices in Science

- **Effective Governance:** Strong leadership and well-defined policies are crucial for achieving research excellence. These provide direction and ensure that research activities are organized and aligned with national development goals.
- **Open Science:** Integrating values and principles of open science as defined in the 2021 UNESCO Recommendation on Open Science is key for ensuring that science is more accessible, transparent, inclusive, and responsive to societal needs.
- **Strategic Funding:** Sustainable and reliable funding mechanisms are necessary to support the most important research areas. Consistent financial support helps maintain ongoing projects and encourages new, innovative research.
- **Investing in People:** Developing a skilled scientific workforce is crucial. Capacity-building programs, including education, training, and mentorship, are essential to equip researchers with the knowledge and skills they need.
- **Ethical Conduct:** Maintaining high ethical standards is vital to ensuring the integrity of research and maintaining public trust. Clear guidelines and strict adherence to ethical practices are necessary for credible and reliable scientific outcomes.
- **Impact Evaluation:** Measuring the impact of research helps ensure that resources are used effectively to address significant problems. This evaluation guides future funding and policy decisions.
- **Collaborative Networks:** Strong partnerships among researchers, institutions, and stakeholders drive innovation. Collaboration enhances the sharing of knowledge, resources, and expertise, leading to more impactful research.
- **Engaging the Public:** Public understanding and participation are critical for the success of science. Engaging with the public helps to demystify scientific processes, increase trust in science and promote a supportive environment for research.
- **Building for the Future:** Planning for sustainability ensures that research efforts can continue and grow over time. Long-term strategies are needed to maintain research capacity and maximize impact, ensuring ongoing contributions to scientific progress and societal well-being.



8. IMPLEMENTATION

The detailed Implementation Plan of the STISA 2034 will be led by AUC-ESTI and AUDA-NEPAD in collaboration with other STI partners. The Plan will be structured in an actionable way that facilitates easier adoption and operationalization by a broad spectrum of stakeholders. Stakeholders include the private sector, non-profit organizations, foundations, development agencies, government bodies, academic and research institutions, Member States, RECs, and continental and international entities.

The Implementation Plan of STISA 2034 will follow an agile, phased approach to effectively manage complexity, resources, risks, scalability, stakeholder engagement, change management and sustainability. This phased design ensures that each stakeholder can identify their specific roles, adopt relevant actions, and integrate them seamlessly within their mandates and operations. Through this process, the plan will drive the transformation of Africa's STI ecosystem, in alignment with the strategic objectives and indicators outlined in the STYIP moonshots and aspirations of Agenda 2063. Furthermore, the plan will incorporate robust systems for monitoring and evaluation, communication strategies, resource mobilization, and partnership mechanisms to ensure successful execution and long-term sustainability.

9. CONCLUSION

Contemporary shifts in the global development landscape and socio-economic transformation in Africa have had implications for science, technology and innovation. Previous STI frameworks for the continent have made important achievements, yet significant disparities remain unaddressed. It is worth noting that gaps in coordination, ownership and resourcing account for some of the limitations in success. However, Africa's collective potential represents enormous possibilities for making scientific products and processes more accessible and inclusive. STI usage has seen a notable increase, and there have been substantial improvements in scientific output in Africa. This progress is driven by increased cooperation within the continent, the establishment of research initiatives, and the implementation of local financing mechanisms. Africa's socio-economic development can be significantly transformed due to the increased space for partnerships and collaboration, along with the emerging trends in science and technology.

STISA 2034 is designed to catalyze industrialization, human capital and skills development In this endeavour, there must be a strong commitment to empowering the youth and women. It is an empowering STI instrument for utilizing Africa's abundant natural and human resources to attain its socio-economic aspirations as stated in the Agenda 2063. Its success depends to a large extent on ownership by all stakeholders. The STISA 2034 sets the stage to inspire Africans into a new era of positioning STI at the heart of continental development.

ANNEX 1: STISA 2034 THE TASK FORCE

MEMBER STATES		
1.	**Dr Abdelouahid Ezzarfi**, Head of Division of Coordination and Research Ministry of Scientific Research and Innovation, Morocco	Northern
2	**Prof. Djamal Eddine Aketeche**, Rector of the University of Science and Technology, Houari Boumediène - Algiers, Algeria	Northern
3.	**Mr Franklin Mukuna,** Deputy Director Technical Education, State Department of Technical, Vocational Education and Training, Ministry of Education, Kenya	Eastern
4.	**Mr Leon Ndumba Ebapani**, Democratic Republic of Congo	Central
5.	**Ms. Mandry Ntshani,** Director: Africa Multilateral Cooperation, Department of Science and Innovation, South Africa	Southern
6.	**Mr. Munezero Angelos,** Public Sector Digitization Analyst, Ministry of ICT and Innovation, Rwanda	Eastern
7.	**Dr. Solomon Benor,** CEO Research and Community Engagement Affairs Ministry of Education and STI, Ethiopia	Eastern

RECs	
1.	**Mr Edward Ssekalo**, Content Manager – 50MWSP, COMESA Secretariat
2.	**Mr. Reaboka Morakabi,** Programme Officer-Science, Technology and Innovation, Directorate of Industrial Development and Trade (IDT), Southern African Development Community (SADC)
3.	**Dr Roland Kouakou,** Head of Division of Science and Technology, Economic Community for the West African States (ECOWAS)

AFRICAN SCIENTIFIC/RESEARCH INSTITUTIONS	
1.	**Dr. Nicholas Ozor**, Executive Director, African Technology Policy Studies (ATPS)
2.	**Dr Peggy Oti-Boateng,** Executive Director, African Academy of Sciences (AAS)
3.	**Dr Robert Ridley,** Vice-Chancellor Unicaf University, Lilongwe, Malawi
4.	**Prof. Tom Peter Migun,** Executive Director, African Centre for Technology Studies (ACTS)

AU SYSTEM BODIES	
1.	**Prof. Akeredolu-Ale Bolanle Idowu,** Vice Rector, Pan African University
2.	**Mr. Bahdon Daher Ismael**, SME Expert, Department of Economic Development, Trade, Tourism, Industry, Mining (AUC-ETTIM)
3.	**Mr Moses Bayingana,** Senior Policy Officer, ICT, Department of Infrastructure and Energy (AUC-DIE)
4.	**Mr. Daniel Lamnyaye,** STI Advisor to the AUC Chairperson
5.	**Mrs Christelle Yannick,** STI Expert, AUDA-NEPAD
6.	**Prof. El Sharif Amany Abdallah Elsayed,** Vice President, Pan African University Counsel

AU SYSTEM BODIES	
7.	**Dr Elvis Temfack,** Senior Research Officer, Center for Science and Innovation, Africa Centres for Disease Control and Prevention, (AU-AfCDC)
8.	**Ms. Esther Ndagire,** Programme Officer, Women, Gender and Youth Directorate (AUC-WGYD)
9.	**Mr Lukovi Seke,** Program Officer, Science Technology and Innovation, AUDA-NEPAD
10.	Dr Vroh Bi Irie, Ag. Executive Secretary, African Observatory of Science, Technology, and Innovation (AU-AOSTI)
UN AGENCIES	
1.	**Mr Hambani Masheleni,** Science Advisor, UNESCO/ Laison Office to the AU
2.	**Dr. Mactar Seck,** UNECA
NGOs / CIVIL SOCIETY	
1.	**Ms. Peris Wakesho,** Change Leader, East Africa, Ashoka
2.	**Ms. Timi Onafeso,** Partnerships and Fundraising Manager, WAAW (Working to Advance Science and Technology Education for African Women) Foundation

ANNEX 2: STISA 2034 DRAFTING TEAM

#	NAME/INSTITUTION
1.	**Mr. Adiatou Fatty,** Communication Officer, GMES & Africa Program, Science, Technology and Space Division, African Union Commission
2.	**Prof. Almamy Konte,** University Cheikh Anta Diop of Dakar (UCAD)
3.	**Mr. Hamdi Kacim,** Earth Observation Expert, GMES & Africa Program
4.	**Prof. John Ouma Mugabe,** Professor of Science, Technology and Innovation, Univerity of Pretoria
5.	**Dr. Kudakwashe Dandajena,** Principal Programme Officer Technology Strategy, AUDA-NEPAD
6.	**Prof. Islam Abou El-Magd,** President of NARSS, Counselor for the Minister of Higher Education and Scientific Research, Egypt
7.	**Mrs. Mahlet Teshome,** Biosafety Expert/S&T Policy, Science Technology and Space Division African Union Commission
8.	**Mr. Meshack Ndiritu,** Training Officer, GMES & Africa, Science, Technology and Space Division African Union Commission
9.	**Dr. Monica Idinoba,** STI Expert, EarthWorth LTD, Nigeria
10.	**Dr. Nkem Khumbah,** Head, STI Policy Systems, Governance and Partnerships, African Academy of Sciences (AAS)
11.	**Dr. Tidiane Ouattara,** Head of Science, Technology and Space Division, African Union Commission
12.	**Dr. Wilhemina Quay**, Director CSIR-Science and Technology Policy Research Institute, Ghana
13.	**Mr. Yayehyirad Kassa,** Finance Officer, Research Grant Program, Science, Technology and Space Division African Union Commission