STISA-2024

Science, Technology and Innovation Strategy for Africa 2024

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Acknowledgement

"On the Wings of Innovation", the Science, Technology and Innovation Strategy for Africa (STISA-2024) was realised through the valuable contributions of many individuals and organizations that invested both their time and resources in the process. The Commission would, therefore, like to extend its profound gratitude and acknowledgement to all those who participated in the development of STISA-2024 and all processes that led to its adoption by the Heads of State and Government in June 2014. Special mention goes to a High Level Panel of eminent African and Diaspora scientists that was co-chaired by Prof. Calestous Juma, of Harvard Kennedy School and Prof. Ismail Serageldin Director of Bibliotheca Alexandrina . This panel presided over the review of the Consolidated Plan of Action and the subsequent development of STISA-2024. The Panel was supported by a Working Group that drew expertise from regional institutions namely, the NEPAD Agency, the African Academy of Sciences, African Development Bank, International Council for Science Regional Office for Africa (ICSU-ROA), United Nations Economic Commission for Africa and United Nations Education Scientific and Cultural Organization.

"We shall accumulate machinery and establish steel works, iron foundries and factories; we shall link the various states of our continent with communications; we shall astound the world with our hydroelectric power; we shall drain marshes and swamps, clear infested areas, feed the undernourished, and rid our people of parasites and disease. It is within the possibility of **science and technology** *to make even the Sahara bloom into a vast field with verdant vegetation for agricultural and industrial developments".*

President Kwame Nkrumah,
First speech at the foundation summit of the Organization of African Unity,
Addis Ababa, 24 May 1963

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List of Acronyms

AAS	*African Academy of Sciences*
AAU	*Association of African Universities*
AfDB	*African Development Bank*
AIDA	*Accelerated Industrial Development for Africa*
AMCOST	*African Ministerial Council on Science and Technology*
AOSTI	*African Observatory of Science Technology and Innovation*
ASTII	*African Science, Technology and Innovation Indicators*
ASRIC	*African Scientific, Research and Innovation Council*
AU	*African Union*
AUC	*African Union Commission*
ALC	*African Laser Centre*
ARIPO	*African Regional Intellectual Property Organization*
CAADP	*Comprehensive African Agriculture Development Programme*
CAMES	*Conseil Africain et Malgache pour l'Enseignement Superieur*
CPA	*AU Africa's Science and Technology Consolidated Plan of Action*
EU	*European Union*
FARA	*Forum for Agricultural Research in Africa*
GDP	*Gross Domestic Product*
HEI	*Higher Education Institute*
ICT	*Information and Communication Technologies*
ICSU-ROA	*International Council for Science - Regional Office for Africa*
IPR	*Intellectual Property Right*
M&E	*Monitoring and Evaluation*
NEPAD	*New Partnership for Africa's Development*
NEPAD Agency	*NEPAD Planning and Coordinating Agency*
NSTIH	*NEPAD Science, Technology and Innovation Hub*
OAPI	*Organisation Africaine de la Propriete Intellectuelle*
PAIPO	*Pan African Intellectual Property Organization*
PAU	*Pan African University*
PIDA	*Programme for Infrastructure Development for Africa*
PMPA	*Pharmaceutical Manufacturing Plan for Africa*
R&D	*Research and Development*
REC	*Regional Economic Community*
S&T	*Science and Technology*
STC	*Specialized Technical Committee*
STI	*Science, Technology and Innovation*
STISA	*Science, Technology and Innovation Strategy for Africa*
TVET	*Technical Vocational Education and Training*
UN	*United Nations*
UNECA	*United Nations Economic Commission for Africa*
UNESCO	*United Nations Educational, Scientific and Cultural Organization*

Foreword

In June 2014, the 23rd Ordinary Session of African Union Heads of State and Government Summit adopted a 10-year Science, Technology and Innovation Strategy for Africa (STISA-2024). The strategy is part of the long-term people centered AU Agenda 2063 which is underpinned by science, technology and innovation as multi-function tools and enablers for achieving continental development goals. The Agenda calls for the diversification of sources of growth and sustenance of Africa's current economic performance, and in the long-run, lifting large sections of our population out of poverty. The strategy, further fosters social transformation and economic competitiveness, through human capital development, innovation, value addition, industrialisation and entrepreneurship.

In pursuing this vision, the African Union emphasizes the importance of "building our universities as centers for excellence, as exemplified by the Pan African University." Investments in education, technical competences and training, and in science, technology, research and innovation remain critical. We must mobilise and widen the involvement of relevant segments of our population, private sector, civil society, parliamentarians and the Diaspora to participate in Africa's science and technology programme. Africa must harvest its population demographic dividend, especially the women and youth, whose energy, creativity and courage must drive its development agenda.

Mobilization of domestic excellence and financial resources and leveraging on external support and collaboration is vital for the successful implementation of STISA-2024. Strategic partnerships and collaboration at the bilateral and multilateral levels are essential for jointly solving global challenges. We have to forge strong partnerships, driven by our shared values and policy objectives and deliver impact on the ground.

With the advent of STISA-2024, the African Union possesses a wonderful tool to accelerate Africa's

transition to an innovation led, knowledge based economy. In as much as the tool is efficient, benefit is only realizable in the right environment and particularly, with the right implementation.

As primary stakeholders, it is the responsibility of AU Members States in conjunction with all the implementing bodies, chief among them the NEPAD and the AfDB, to rally and engage capable hands to utilize this tool for maximum benefit.

The African Scientific and Technical community, (researchers, development partners, academics, engineers and other innovators) from the continent and the Diaspora, is invited to organize itself into networks in order to collectively realise our common goals.

Accompanying and supporting African move towards increased innovation, the private sector has a role in identifying and supporting new opportunities.

It is our deep conviction that STISA-2024 will contribute to the Africa we want, through a strong political will and trust in the intellectual capacity of the sons and daughters of the continent.

Dr. Martial De-Paul Ikounga
Commissioner for Human Resources, Science & Technology
Africa Union Commission

Executive Summary

On the Wings of Innovation, the AU Science, Technology and Innovation Strategy for Africa 2024 (STISA-2024) places science, technology and innovation at the epicentre of Africa's socio-economic development and growth.

The STISA-2024 has been developed during an important period when the African Union was formulating a broader and long-term AU Agenda 2063. The STISA-2024 is the first of the ten-year incremental phasing strategies to respond to the demand for science, technology and innovation to impact across critical sectors such as agriculture, energy, environment, health, infrastructure development, mining, security and water among others. The strategy is firmly anchored on six distinct priority areas that contribute to the achievement of the AU Vision. These priority areas are: **Eradication of Hunger and Achieving Food Security; Prevention and Control of Diseases; Communication (Physical and Intellectual Mobility); Protection of our Space; Live Together- Build the Society; and Wealth Creation**.

The strategy further defines four mutually reinforcing pillars which are prerequisite conditions for its success. These pillars are: **building and/or upgrading research infrastructures; enhancing professional and technical competencies; promoting entrepreneurship and innovation; and providing an enabling environment for STI development in the African continent**. Continental, regional and national programmes will be designed, implemented and synchronized to ensure that their strategic orientations and pillars are mutually reinforcing, and achieve the envisaged developmental impact as effectively as possible.

The implementation of STISA-2024 will take place at three levels. At national level, Member States should incorporate this strategy into their National Development Plans. At regional level, Regional Economic Communities (RECs), regional research institutions, networks and partners should leverage the strategy in designing and coordinating initiatives. At continental level, the African Union Commission (AUC), NEPAD Agency and their partners should advocate and create awareness, mobilize necessary institutional, human and financial resources, track progress and monitor implementation.

Continental, regional and national targets and indicators will be defined to facilitate comparability of data and regular Monitoring and Evaluation (M&E) of the programmes. AOSTI, ASRIC and NEPAD Agency shall put in place a harmonised mechanism that will support Member States and RECs to collect standardised data and report on performance periodically. The analysis of data, annual reports and regular progress reviews will constitute an important management tool of the entire system.

While there are conventional mechanisms for funding Research and Development (R&D) and Innovation, it is essential to establish efficient, effective and coordinated financing mechanisms to implement the strategy. The AUC and NEPAD Agency shall mobilize and coordinate resources for technical support in developing and implementing national and regional plans and priority programmes. AU Member States and RECs will take a lead role in mobilizing public, private and donor resources for the coordinated implementation of national and regional programmes.

Vision of the African Union and Mission of STI

The African Union is committed to achieve its vision of ***"An integrated, prosperous and peaceful Africa, an Africa driven and managed by its own citizens and representing a dynamic force in the international arena"*** through its Agenda 2063.

The AU Agenda 2063 recognizes Science, Technology and Innovation (STI) as multi-functional tools and an enablers for achieving continental development goals. The Agenda, further, emphasizes that Africa's sustained growth, competitiveness and economic transformation requires sustained investment in new technologies and continuous innovation in areas such as agriculture, clean energy, education and health.

The STISA-2024 shall contribute to the achievement of the AU Vision (Figure 1). Due to the cross cutting nature of STI, STISA-2024 is designed to meet the knowledge, technology and innovation demands in various AU economic and social sector development frameworks. STISA-2024 has a leading role to play in increasing efficiency (and eliminating duplication of effort) in the design and implementation of national, regional and African Union policies on STI.

The Mission of STISA-2024 is to ***"Accelerate Africa's transition to an innovation-led, Knowledge-based Economy".*** This will be achieved by:

- Improving STI readiness in Africa in terms of infrastructure, professional and technical competence, and entrepreneurial capacity; and

- Implementing specific policies and programs in science, technology and innovation that address societal needs in a holistic and sustainable way.

Fig. 1: The role of STI in achieving the vision of the African Union

Chapter 1

Introduction

1.1 Historical Background

African countries made a bold attempt to turn around their development fortunes by adopting the Monrovia Strategy in July 1979, and the Lagos Plan of Action (LPA) for the Economic Development of Africa [1980–2000] and Final Act of Lagos in April 1980. The LPA was a visionary, far-reaching and unprecedented blueprint on how to foster collective self-reliance and sustainable development of the continent. Subsequent attempts at charting Africa's development have drawn inspiration from that visionary framework.

Among many conferences that followed the Lagos Plan

of Action was CASTAFRICAII organized by UNESCO/ OAU/ECA, which brought together experts and 26 African ministers responsible for STI, to develop strategies for the economic recovery of Africa. The adoption of the Abuja Treaty in 1994 to achieve mutually beneficial economic integration through establishing an African Economic Community (AEC), constituted an important and forward looking act by the African Heads of State and Government. The transformation of OAU to AU in Lusaka, Zambia in July 2001 was envisioned to "build an integrated, prosperous and peaceful Africa, an Africa driven and managed by its own citizens and representing a dynamic force in the international arena". It was also intended to accelerate implementation of the Abuja Treaty, demonstrating a renewed commitment of African political leaders to the socio-economic advancement of the continent.

The Constitutive Act of the AU made provisions for the following organs and continental institutions in accordance with the stipulations in the Abuja Treaty and the Sirte Declaration on the creation of the AU: The Assembly of the Union; The Executive Council; The Pan-African Parliament; The Court of Justice; The Permanent

Representatives Committee (PRC); The Specialized Technical Committees (STCs); The Economic, Social and Cultural Council; two financial institutions, namely the Central Bank and the African Monetary Union and The Commission of the AU. The creation of AU was also associated with the adoption of the New Partnership for Africa's Development (NEPAD) at the July 2001 Summit in Lusaka. It also identified and established the Department of Human Resources Science and Technology, as one of 8 technical departments of the African Union Commission with the mandate to advance education, science and technology, and human capital development in the continent.

The African Union Commission (AUC) established a Conference of Ministers in charge of Science and Technology (AMCOST), to enable the Union to periodically deliberate and have a collective voice on science and technology issues. Following the first Summit in Maputo, Mozambique in July 2003, the Consolidated Plan of Action (CPA) was presented in 2005 as an instrument for the implementation of the decisions of the African Union Assembly of Heads of State and Government on STI and endorsed for immediate implementation in 2006 at the Khartoum Summit of the African Heads of State.

1.2 CPA Review Outcome

The CPA was approved to be implemented to address the following clustered key flagship research and development programmes: Cluster 1: Biodiversity, Biotechnology and Indigenous Knowledge: Including (i) Conservation and Sustainable Use of Biodiversity; (ii) Safe Development and Application of Biotechnology; and (iii) Securing and Using Africa's Indigenous Knowledge Base; Cluster 2: Energy, Water and Desertification: Including (i) Building a Sustainable Energy Base; (ii) Securing and Sustaining Water; and (iii) Combating Drought and Desertification; Cluster 3: Material Sciences, Manufacturing, Laser and Post-Harvest Technologies: Including (i) Building Africa's Capacity for Material Sciences; (ii) Building engineering capacity for Manufacturing; (iii) Strengthening the African Laser Centre (ALC); and (iv) Technologies to Reduce Post harvest Food Loss; Cluster 4: Information and Communication Technologies: Including (i) Information and Communication Technologies and (ii) Establishing the African Institute of Space Science; and (5) Cluster 5: Mathematical Sciences: including the Next Einstein Initiative.

In its design, the CPA provided for a five year review to assess the implementation impact, strengthen linkages with other AU and NEPAD development frameworks, and boost investment. The Bureau of the AMCOST IV resolved that the CPA review process should be conducted under the oversight of a High Level Panel of eminent scientists with support of a Working Group comprising representatives from the African Academy of Sciences, African Union Commission, NEPAD Agency, African Development Bank, ICSU, UNECA and UNESCO.

Significant achievements in the implementation of the CPA were realized in the following areas: (a) establishment of Networks of Excellence; (b) African Union Competitive Research Grants; (c) capacity development; and (d) improved policy conditions and building innovation mechanisms. Challenges were also encountered including (a) over-reliance on external financial support, which is often targeting short-term activities and solutions, (b) limited scope of human and sustainable development; (c) inadequate linkage of the CPA to other continental frameworks and strategies.

The High Level Panel developed the African Union STI Strategy as a successor of the CPA, taking into account the findings of the CPA review (Figure 2) and current development trends on the continent. In drafting the STISA-2024, one of the steps taken by the Working Group was to incorporate wider perspectives from consultations with the public, private, education and research institutes, RECs, AMCOST, civil society and other regional and international forums. The achievements and lessons learnt from implementing the CPA were the foundation on which the current strategy was built.

Fig. 2: Moving from the STI plan to the STI strategy

The CPA was erected on three interrelated conceptual pillars namely STI capacity building, knowledge production and technological innovation. These form part of the prerequisite conditions for the successful implementation of STISA-2024.

The existing R&D Cluster Programs of the CPA have also been incorporated among the flagship programs of the strategy. Building on the experiences of the CPA, STISA-2024 places STI at the epicentre of Africa's social and economic development within the long-term AU Agenda 2063.

1.3 Situational Analysis

The implementation of the CPA influenced the role that science, technology and innovation play in Africa's socio-economic development. These influences were translated into policy instruments at various levels to achieve transformative and emancipatory goals by means of building institutions and implementing programmes.

The situational analysis of STI in Africa summarised below builds on evidence generated by the surveys conducted on Science, Technology and Innovation Policy-making in Africa: An Assessment of Capacity Needs and Priorities , and the environment scan which supported the review of the CPA.

a) Increased recognition by African leadership and the public of the critical role STI plays in economic growth and human development

Recent political, policy statements and instruments underscore the need for increased investment in STI to achieve sustainable socio-economic growth, reduce poverty and achieve food security, fight key communicable and non-communicable diseases, and stem environmental degradation. This is evidenced by the launch of regional networks as implementation mechanisms for the CPA R&D flagship programmes in the areas of biosciences, biotechnology, biosafety, laser technology, mathematical sciences, water and energy as well as programmes related to measuring STI support to evidence based policy making.

b) Insufficient funding for STI

Recent statistics from UNESCO and ASTII show that the current level of investment in R&D by Africa as a continent (of which more than half is internationally funded) puts Africa at a strategic disadvantage. Most STI activities are not sustainable as they are over reliant on short-term project funding often linked to events such as workshops and consultancies. Important aspects of STI policy development such as establishing comparable baseline data and Monitoring and Evaluation(M&E) are not budgeted for (and thus not resourced) in most Member States. By and large, this reflects the gap in

achieving the 1% of GDP target agreed by AU Member States as desired minimum expenditure on R&D.

c) Organisational capacity by entities responsible for STI policy making

Most of the entities responsible for STI policy making have operated in isolation from other policy agencies, with weak links not just to the private and education and research sectors, but also to African and international Policy Research Think Tanks. Not having easy access to empirical material and recent knowledge in STI policy-making and ignoring inter-sectoral linkages and policy mixes make their institutional outputs much less reliable.

Let's cross the bridge

d) Infrastructure to support innovation

Readiness to support innovation and facilitate competitive business activities requires infrastructure such as broadband Internet access, basic telecommunication services, reliable electricity supply, water, good transportation networks, laboratory facilities, and tax systems that support private sector innovation. The AU Programme on Infrastructure Development for Africa (PIDA) revealed different levels of infrastructure readiness to support innovation in African economies. This is also reflected in Africa's low scores in many major classifications or indices such as the world's leading universities, competiveness index, and so on.

e) Inadequate Expertise on STI policy development

Many of the officials involved in or responsible for drafting policy documents do not have the necessary skills or training and have no experience in evidence-based policy making. Moreover, in most countries, institutions responsible for STI policy do not have appropriate libraries or easy access to sources of relevant information for policy-making purposes. Very limited evidence-based policy development takes place in Africa.

f) Emergence of African civil society organisations and Think Tanks dedicated to raise awareness of STI

Civil society organisations and Think-Tanks are championing the use of African indigenous knowledge to support sustained economic growth, and inform public attitudes and understanding of the relevance and importance of STI. While they contribute to STI policy debate in areas including biosafety, climate change, biodiversity and environment regulation and ICT, most contributions are not supported by evidence.

g) Bilateral and multilateral cooperation

Bilateral and multilateral partnerships have shaped STI development in Africa (e.g. the European Union–Africa Joint Strategy, the India–Africa Science and Technology Initiatives and the China –Africa Science and Technology Partnership). However, most of these interventions and cooperation mechanisms are not adequately designed to promote African ownership, accountability and sustainability.

h) Scientific Output

Africa is registering an increased number of scientific publications as well as acquisition of capital goods. For example, Tunisia reported a ten-fold increase in the number of scientific publications between 1990 and 2010 while Uganda achieved over 1,200% growth during the same period. About 18 African countries have achieved a fourfold increase in imports of capital goods between 2000 and 2011. Steady investment in STI, expansion of R&D institutions and political support may account for this surge in both technology acquisition and number of scientific papers published.

1.4 Rationale

The STISA-2024 has been developed during an important period when the African Union was simultaneously developing the AU Agenda 2063. Agenda 2063 recognizes Science, Technology and Innovation as one of the major drivers and enablers for achieving development goals of the African Union and its Member States. The Agenda articulates that Africa's sustained growth, competitiveness and economic

transformation will require sustained investment in new technologies and continuous innovation in areas such as agriculture, clean energy, education, health and bio-sciences. The Agenda also highlights the need to curb the traditional Brain Drain and retain a critical mass of high calibre individuals who excel in science, research and technology.

The focus of the STISA-2024 is to address the aspirations identified under the Agenda 2063 and to link those achievements realized under the CPA implementation and current and future opportunities in recognising STI development in the African continent. STISA-2024 is a short term incremental strategy designed to address Africa's challenges, with the ultimate goal of contributing significantly to the AU vision (Figure 3). STISA-2024 responds to the demand for science, technology and innovation to impact on critical sectors including agriculture, energy, environment, health, infrastructure, mining, security and water among others. Each of the anticipated five 10 year strategies towards 2063 will represent a milestone, which will be subject to evaluation to inform the next set of milestones. The objectives of each subsequent 10 year strategy will reflect achievements to date and the needs of the continent as they continue to evolve.

Fig. 3: Timing of the STI strategy within Agenda 2063

Chapter 2

Strategic Orientation

2.1 Priority Areas

This strategy is designed to respond to the need of transforming Africa into a Knowledge-based and Innovation-led Society. It reflects the AU Vision and takes into account priorities identified for the continent, and contained in various AU sectoral frameworks. The priority action areas have been identified and validated by African and International Research and Innovation Stakeholders from different sectors

such as Agriculture and Food Security, Biosciences, Governance and African Integration, Information and Communication Technologies (ICT), Natural Resources, Public Health, and Human Studies – to provide the necessary foundation to achieve a sustainable African Renaissance.

It is envisaged that the collaborative and coordinated implementation of the identified priority areas outlined below is a prerequisite to building an integrated and prosperous Africa, where citizens are assured of equal access to quality nutrition, healthcare and education and skills training, efficient and cost effective communications, peace and security, and sustainable management of natural resources and environments to secure the interests of future generations.

Priority 1: Eradication of hunger and achieving food security

To alleviate poverty and spur social and economic transformation on the continent, the African Union pays special attention to the development of Rural Economy and Agriculture through various instruments such as the Comprehensive Africa Agriculture Development Programme(CAADP). Statistics show that continued food insecurity directly affects 239 million Africans, with 30% to 40% of children under the edge of 5 years continuing to suffer from chronic under-nutrition at a critical stage for both survival and cognitive and physical development. In January 2013, the Heads of State and Government of African Union, together with representatives of international organizations, civil society organizations, private sector, cooperatives, farmers, youths, academia and other partners, unanimously adopted a Declaration to end hunger in Africa by 2025.

In this regard, Africa must build its response capacities and capabilities and leverage existing relationships with relevant partners outside Africa, to deal with emerging challenges, such as low commodity yields, climate change and variability, water and land management, and increasing price volatility in global markets which could undermine efforts to eradicate hunger and achieve food and nutrition security. Processing, conservation and distribution of agricultural products goes far beyond the framework of rural and agricultural development sectors and requires a concerted intervention of STI.

Priority 2: Prevention and control of diseases

Every year millions of Africans die of communicable and non-communicable diseases that are preventable and treatable; as a result of weak and fragmented health systems; inadequate resourcing to scale proven interventions; limited access to health services and technologies (particularly in rural areas); poor human resources management ; and extreme poverty. African countries will not develop economically and socially without substantial improvements in healthcare delivery.

The 2013 Abuja Special Summit on HIV/AIDS, Tuberculosis, and Malaria highlighted the need to utilize and build on our research capacities to produce new and effective medicines, diagnostic tools, vector control tools and vaccines, and to promote research, invention and innovation in traditional medicine and strengthening local health ecosystems, taking into account the socio-cultural and environmental situation of the people.

In addition, the AU and its Member States must prioritise establishing greater coordination both among health stakeholders as well as with other related sectors contributing to the development of science and technology and building governance structures to promote ethics and research integrity, thus increasing public trust in research. This will require a collaborative effort among various actors to promote and implement key policies and programmes on primary health care, as well as disease prevention and control.

Priority 3: Communication (Physical & Intellectual Mobility)

Guided by the AU Programme on Infrastructure Development for Africa (PIDA), Africa is investing heavily in infrastructural development projects. Implementation of major infrastructure projects must incorporate sustainable knowledge management systems design as well as requisite human skills and competencies. While most of this knowledge has traditionally come from outside the continent, African institutions must take responsibility for integrating robust and sustainable knowledge production

systems in major physical and digital infrastructure programmes. Physical communication is envisioned in terms of land, air, river and maritime routes and equipment, infrastructure and energy, while ICT is referred as intellectual communications (Table 1).

Priority 4: Protection of our space

Earth Observation and Monitoring of Africa's abundant natural resources, including minerals, and biodiversity (and associated indigenous knowledge), are important for conserving the welfare of current and future generations. Currently there is a need to address the huge gap in terms of the requisite infrastructure and critical human resources at all levels to fully realize the potential benefits that would accrue from the sustainable use and conservation of these resources.

Space presents a unique opportunity for the continent to collectively address socio-economic development issues through derived services such as Earth Observation, Navigation and Positioning, Satellite Communication Space Science and Astronomy. It further provides a platform for Member States to cooperate and share the enabling infrastructure and data and jointly manage programmes of mutual interest such as disease outbreaks; natural resources and the environment; hazards and disasters; weather forecasting (meteorology); climate change mitigation and adaptation; marine and coastal areas, agriculture and food security; peacekeeping missions and conflicts.

Priority 5: Live together – build the society

Living together in peace and harmony is increasingly becoming a challenge for the continent. In a few years, Africa will have more than one hundred (100) mega cities, each with more than one million inhabitants. Democracy and integration related issues can be addressed through community driven solutions that leverage the knowledge of African shared values.

Africa is strengthening its governance capacity as many African countries reorganize their state structures to foster entrepreneurship, flexibility to be more responsive to the needs of citizens and champion innovation. STI will help strengthen the capacity of AU Member States to build necessary infrastructure, train future generations of political and social leaders, business people and entrepreneurs, scientists and researchers, and leverage STI for sustainable socio-economic development. This will require a multi-disciplinary approach incorporating social sciences, humanities, and natural sciences.

Priority 6: Wealth creation

Africa's greatest hope for continental development is its vibrant human resources. However, to accelerate Africa's transition to an Innovation-led, Knowledge-based Economy, our Human Resources must be empowered with the necessary skills and greater emphasis must be placed on innovation and on appropriate adaptation of technology and existing research results. It is necessary to promote creativity and innovative technologies to locally process the continent's abundant natural resources, and to create more wealth and jobs for the youth on the continent.

This priority will develop internal capacities; spur the co-creation, development and marketing of new or improved products and services through engagement with end-user communities. This will create new opportunities for value-added employment by adapting and commercializing the outputs of national and regional Innovation across Africa. Conducive political and financial environment is a requirement for strengthening creativity and technological innovation that brings about entrepreneurship in new technological frontiers such as nanotechnology.

	Priorities	Research and/or innovation areas
1	**Eradicate Hunger and ensure Food and Nutrition Security**	- Agriculture/Agronomy in terms of cultivation technique, seeds, soil and climate - Industrial chain in terms of conservation and/or transformation and distribution infrastructure and techniques
2	**Prevent and Control Diseases and ensure Well-being**	- Better understanding of endemic diseases - HIV/AIDS, Malaria Hemoglobinopathie - Maternal and Child Health - Traditional Medicine
3	**Communication (Physical & Intellectual Mobility)**	- Physical communication in terms of land, air, river and maritime routes equipment and infrastructure and energy - Promoting local materials - Intellectual communications in terms of ICT
4	**Protect our Space**	- Environmental Protection including climate change studies - Biodiversity and Atmospheric Physics - Space technologies, maritime and sub-maritime exploration - Knowledge of the water cycle and river systems as well as river basin management
5	**Live Together – Build the Society**	- Citizenship, History and Shared values - Pan Africanism and Regional integration - Governance and Democracy, City Management, Mobility - Urban Hydrology and Hydraulics - Urban waste management
6	**Create Wealth**	- Education and Human Resource Development - Exploitation and management of mineral resources, forests, aquatics, marines etc - Management of water resources

Table 1: Summary of STISA-2024 priority areas

2.2 Strategic Objectives

a) Enhance effectiveness of Science, Technology and Innovation (STI) in addressing/implementing priority areas.

b) Improve technical competencies and institutional capacity for STI development

c) Promote economic competitiveness through fostering innovation, value addition, industrial development and entrepreneurship in synergy with instruments such as the Action Plan for Accelerated Industrial Development of Africa(AIDA) and Pharmaceutical Manufacturing Plan

for Africa(PMPA).

d) Protect knowledge production (including inventions, and indigenous knowledge) by strengthening Intellectual Property Rights (IPR) and regulatory regimes at all levels

e) Facilitate STI policy reforms, harmonization, science diplomacy and resource mobilisation

2.3 Development of flagship programs

STISA 2024 strategy will build on the successes and lessons learnt from implementation of the CPA to develop and implement Flagship programmes that effectively address the six priority areas. Furthermore existing CPA R&D programmes will be streamlined and adapted to support implementation of the strategy. Priority will be placed on adequately resourcing established programmes in response to long term STI goals in the continent. These will be complemented periodically by appropriate, mutually-reinforcing flagship programmes and projects developed by the scientific community through the ASRIC.

Figure 4 (next page) highlights the essential, cross-cutting contribution of *water* across all six priority areas. Its importance will require setting up of flagship programmes such as those dealing with water availability, quality, river regimes, water cycles and water resources in different regions of the continent. A similar analogy applies to other key domains such as *space, agriculture, energy, and ICT*.

Using the analogy of a bicycle wheel, a lead programme will serve as the hub that simultaneously coordinates and is supported by appropriately balanced and positioned spokes reflecting programmes contributed, developed and/or implemented by different stakeholders including RECs and Member States. This is how it is envisaged that flagship programs for each priority will be developed and executed under STISA-2024.

Accordingly, this Strategy is indicative. It provides guidance on the types of instruments and measures that are needed. It can be used as a model to inform the design and revision of national and regional STI Strategic Plans, recognizing that implementation is the responsibility of national governments and, where appropriate, the RECs.

PRIORITIES definition falls within political decision making. **KEY DOMAINS** refer to the priorities common concerns. The African Scientific Community is urged to transform priorities and their key domains into **FLAGSHIP PROGRAMMES** from which **RESEARCH PROGRAMMES** to be executed in both public and private laboratories shall be delivered.

It is essential to translate the programmes in terms of bankable development projects which will enable policy-makers support them and use the appropriate procedure both internal and external to finance them to legitimately expect to reap the best fruits at the national, regional and continental levels.STISA-2024 is the first in a series of ten year strategies and it is envisaged that its roll out will be executed along the following phases (Figure 5):

Fig. 4:.Example of Flagship Programmes on Water

Phase 1: 2014: Institutional Setting: This includes informing the establishment and resourcing of required institutions at national, regional and continental levels through comprehensive stakeholder consultations, and a coordinated and integrated communication campaign to secure necessary ownership and support from all key stakeholder groups. This will also facilitate the integration of the strategy in national and regional STI processes. Execution of this phase will mainly be the responsibility of the African Union Commission.

Phase 2: 2015-2017: Development and Implementation

2.4 Implementation Phases of the Strategy

of the first Set of flagship Programs. Three year flagship programs will be elaborated, adopted and implemented, building on concluded or current successful national and regional programs. The NEPAD Centres of Excellence, Pan African University and/or other networks will be given responsibility and the necessary resources to effectively coordinate implementation of these programs in each priority area. ASRIC will be responsible for coordinating the co-creation and development of flagship programs to ensure broader coordination with other continental priorities using STI as a catalyst to address sectoral priorities and challenges.

Phase 3: 2018-2020: Based on lessons learnt and M&E during Phase 2, the second set of flagship programs will be elaborated, implemented and evaluated.

Phase 4: 2021-2023: Based on lessons learnt and Monitoring and Evaluation during Phase 3, the third set of flagship programs will be elaborated, implemented and evaluated.

Phase 5: 2024: Final evaluation of the strategy, lessons learnt and impact to date combined with a 360 degree review of current priorities as they have evolved during the ten year period will guide the adoption of objectives, performance metrics and milestones for the next ten year strategic plan.

Fig. 5: Detailed timing of STISA-2024

Chapter 3

Pillars

PREQUISITE ACTIONS

- *A strong political will and trust in the intellectual capacity of the sons and daughters of the continent*
- *Revamp STI infrastructure in African countries*
- *Enhance technical and professional competencies*
- *Take measures to curb brain drain so that the limited means of the continent are not transformed to investment in other continents*
- *Achieve the necessary critical mass of human capital needed*
- *Provide enabling environment for STI*
- *Build a strong science culture*
- *Strengthen IP and regulatory systems*
- *Encourage collaboration within and between states in the area of innovation and entrepreneurship*

Successful implementation of the strategy requires a minimum set of requisite infrastructure, human resources with necessary skills and an enabling environment for the achievement of an Innovation-led, Knowledge-based Economy. The flagship programs for each of the strategic priorities presented in the previous chapter require specific efforts from Member States. African Union Member States and Regions are at different stage of readiness in terms of infrastructural, human and organizational capacity to successfully undertake coordinated STI activities. Therefore, to

ensure successful implementation of STISA-2024 in the identified six priority areas, appropriate support will be provided to African countries in building their capacity to implement the necessary national STI plans envisaged.

This chapter outlines necessary implementation actions required to improve the level of STI readiness of Member States.

Monitoring and Evaluation will be undertaken and comparable Performance Metrics and Milestones agreed for each Member State and REC to assess both progress in STI readiness and their contribution to and benefits experienced from participation in continental flagship programs.

After comparable baseline data has been collected for all Member States, with the support of RECs, upgrade programmes will be defined for national or regional plans to achieve the critical mass of human capital required to undertake coherent and efficient STI activity.

3.1 Infrastructure Development

The development of Science, Technology and Innovation in Africa requires the upgrading of science laboratories and the establishment of world class STI infrastructure. This includes research and innovation facilities such as laboratories (for teaching, engineering and clinical trials), teaching hospitals, ICT equipment and infrastructure, Innovation Spaces, Living Labs and National Research and Education Networks (NRENs). Existing physical and digital infrastructure and resources will be leveraged and networked to increase utilization efficiency at national and regional level and reduce maintenance and operating costs through Shared Services. NRENs will facilitate coordinated collaboration by education and research institutions between one another as well as with Innovation Spaces and Living Labs, thus strengthening both the overall Research and Innovation Ecosystems and the scale and quality of training and support available to entrepreneurs and other innovators.

Engineering applications will be used to develop and maintain scientific equipment that would allow the conduct of good science. This will require partnerships between scientists and engineers in order to provide solutions for producing scientific equipment, and research and inventive genius led products. To develop infrastructure, a human capital base must be trained with the necessary competencies and capabilities to plan, organise, lead, coordinate and ultimately ensure that systems and resources are in place for implementation. This is evident when considering the repercussions of building competences of engineers and science, technology and engineering (STE) professionals. Governments will need to make the necessary steps to ensure this enabling environment exists towards building research innovations.

3.2 Technical Competences

Realising the full potential of Science, Technology and Innovation to support sustainable socio-economic growth and development, and improving African competitiveness in global research and innovation, require that Member States continue to expand the availability of quality post-graduate education, and in particular programmes leading to doctoral qualifications. To achieve this goal, Member States must take a systematic and coordinated approach to human capital development and popularising STI research and innovation as potential career paths at both secondary and higher education levels including TVETs.

Furthermore, deliberate measures should be taken to curb brain drain so that the limited means of the continent are not transformed to investment in other continents. This is to ensure that the continental intellectual capacity can be effectively harnessed to drive Africa's socio-economic development.

Measuring impact will be based on comparative annual Performance Metrics including increase in number of Africans trained in STI, increase in research and innovation output at national and regional level, increase in qualified staff to support expansion of research-intensive HEIs, TVETs and research centres (especially multi-stakeholder Centres of Excellence) on the continent. STI management should be properly resourced in terms of financial and human resources, skills training and working conditions. These measures are critical to the enhancement of STI technical competence in Africa.

3.3 Innovation & Entrepreneurship

A multi-disciplinary and multi-sectoral approach to Collaborative Open Innovation and Entrepreneurship is essential to achieving the Knowledge Economy and sustainable socio-economic development across Africa. Increasing networking and collaboration between education and research, private and public sector stakeholders (at both national and regional level) will facilitate co-creation, adaptation and commercialisation of research and innovation outputs while ensuring research and innovation programmes are regularly valorised for impact and alignment with national and regional policy objectives as these continue to evolve.

Such commitment to national and cross-border coordination of research and innovation actors will strengthen the socio-economic situation of the continent through local ownership and wider utilization of research outputs and technology acquisition. Taking a systematic approach to technology transfer and knowledge sharing, co-creation and adaptation of new products, services, processes, business models and policies and commercialization of research and innovation outputs will stimulate local, national and regional Innovation ecosystems. This will result in better public services (including entrepreneurial innovation based on Open Data), the creation of new economic sectors, wider employment opportunities in the formal economy and commercialization of technologies with regional relevance and global potential.

3.4 Enabling Environment

An overall enabling environment for STI must be created by Members States and RECs to achieve the priorities identified in the strategy. The creation of such an environment involves Member States, RECs and the AU having evidence based policies and programmes that encourage STI development. Every Member State requires a coherent national framework for actions that directly affect the promotion of STI.

National STI programmes should be developed by governments in consultation with all national and regional research and innovation stakeholders from the public, private, education and research, societal, international development and funding sectors.

An enabling environment also implies building a comprehensive STI research and innovation culture, strengthening legal and regulatory systems to ensure they are fit for purpose and promote innovation and IP creation and actively promote equal opportunity careers in STI research and innovation.

The status of researchers must be attractive and offer better working and living conditions. The perception of the society must value the research profession. Such a conducive environment will also attract the Diaspora.

Chapter 4

Governance and Implementation Arrangement

The successful implementation of this STI policy primarily depends on the suitability of the chosen institutional arrangement, the capacities and complementarities of the institutions involved. Figure

6 provides an overarching arrangement of the different structures involved in the STISA processes. The illustration on the next page presents the most relevant stakeholders/actors.

Fig.6 : Institutional Architecture for implementation of STISA-2024

4.1 Decision Making Institutions

African Heads of State and Government: They will support the STISA-2024 Strategy based on adoption of its priorities. Heads of State and Government will champion and popularize the integration of STISA-2024 in national, regional and continental development policies, programmes and frameworks. To strengthen and champion STISA-2024 at the continental level, it is important that a high level Support Committee of at least six Heads of State and Government supported by high level scientists/researchers from Africa and the Diaspora be formed to serve as STI Ambassadors. From time to time, the Support Committee may invite eminent persons from the public, private, education and research, international development and funding sectors based on solely their expertise and commitment (irrespective of gender or country of origin)to contribute to the activities of the Committee.

Executive Council: The Executive Council will adopt the key domains of the strategy as well as the flagship programs, and deliberate on these based on evidence based follow-up reports every three years.

Ministerial Conference for Coordination and Harmonization of Flagship Programs: To take into account the STI demand from all sectors, it is necessary to create over and above the current Conference of Ministers of the African Union, a coordination body responsible for examining the key sectors and flagship programs for the entire continent to facilitate harmonization. This body will be chaired by the President of the STC on Education, Science and Technology and its membership will comprise all the chairs (with or without) the vice –chairs of all the other STC. This council will use the ASRIC-STRC as its main tool and could meet every two or three years as required.

Specialized Technical Committee (STC) in charge of Education, Science and Technology: The African Union Specialized Technical Committee (STC) in charge of Education, Science and Technology will serve as a technical committee to advise the AU Heads of State and Government on Science, Technology and Innovation matters. The STC is responsible for establishing policies, strategic priorities and coherent, coordinated approaches for developing and implementing strategies for STI. The STC will exercise policy oversight and mobilize resources for implementation of STISA-2024.

African Union Commission: The African Union Commission as the AU secretariat shall be responsible for providing political and policy leadership for implementation of this Strategy. Its specific roles will include: (a) convening meetings of the STC 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) leading delegations to international processes and negotiations on Science, Technology and Innovation issues (d) providing a focal point for liaising with United Nations agencies, it's conventions and related scientific bodies on matters pertaining to policy, (e) convening annual partnership platforms and (f) creating various advocacy schemes for promoting Science, Technology, Innovation and ICT.

4.2 Implementing Institutions

Member States: Member States will mobilize funds, active participation and contributions from public, private, education and research, societal, international development and funding sector stakeholders to implement the various initiatives emanating from this Strategy.

Regional Economic Communities: RECs will mobilize funding and align regional STI and ICT plans to this STI Strategy by integrating the Strategy in other sectoral development plans and coordinating programme implementation at regional level. They will also coordinate with the AUC and NEPAD Agency in implementation of the STI Strategy and submit implementation status reports bi-annually to the AMCOST.

NEPAD Agency: The NEPAD Agency, through its Science, Technology and Innovation Hub (NSTIH), shall support the technical implementation of the strategy and coordinate resource mobilization. Its specific roles will include: (a) mobilizing and directing technical

expertise, including regional and continental networks of centres of excellence to implement the programmes and projects established as a result of this Strategy; (b) mobilizing financial resources for the provision of technical support to implement strategic programmes; (c) providing support to ASRIC-STRC in the development of national and regional strategies and action plans; (d) providing technical support to AU Commission's policy processes and activities.

Bodies under the African Union Commission

African Scientific Research and Innovation Council (ASRIC): The African Scientific, Research and Innovation Council is a platform for the development of bankable programmes that address the key socio-economic development challenges in the continent. It acts as an operational unit of the Ministerial Conference for Coordination of Flagship Programs and supports RECs and Member States with its expertise.

ASRIC will not be a permanent organ and will meet bi-annually or annually depending on its regulations. The STRC, which is an existing specialized technical Office, will serve as the secretariat of ASRIC. On request from the African Union Commission (HRST Department), ASRIC-STRC can establish experts' commissions to deliberate on the flagship program.

STRC: As the secretariat of ASRIC, the STRC will also be responsible for the inventory of research institutions, plans, programs, and other activities belonging to the African Union and present a mapping to inform and establish a harmonization policy. ASRIC will submit an inception report through the AUC (HRST) to the Ministerial Conference for Coordination and Harmonization of Flagship Programs.

African Observatory of Science Technology and Innovation: AOSTI is a specialized Technical Office of the African Union mandated to serve as the continental repository for STI statistics and a source of policy analysis and capacity building of Member States. It shall liaise with RECs and Member States in implementing STI programme measurement.

Pan-African University: PAU is the organ of the AUC for advanced graduate education and postgraduate research. Its five institutes (each of which will support at least ten Centres) were established in response to the demand for STI on the continent. Its research programs will systematically focus on addressing the key priorities identified in STISA-2024.

Pan African Intellectual Property Organisation: PAIPO is in the process of being established to implement AU policy in the field of Intellectual property. It will ensure dissemination of patent information, provide technical and financial support to invention and innovation and promote protection and exploitation of research results.

African Development Bank (AfDB): AfDB undertakes specific programs on STI and like the other partners, synergy and complementarity will be best achieved when AfDB programs are informed by and aligned with the continental strategy.

Development Partners: Similarly, international, continental and national development partner institutions, including civil society and the media will support implementation of the STI Strategy at all levels by providing financial and technical assistance and informing and aligning programmes to the goals of the this Strategy. They will also play important multiplier roles in popularizing the importance of research and

innovation in Africa's development.

Regional and International Research Institutions: institutions with a regional or international mandate to perform research are encouraged to align their priorities to the strategy. They include but not limited to: FARA, CAMES, AAS, AAU, OAPI, ARIPO etc. They will provide technical support to the implementation of the strategy.

Private Sector: The private sector will work closely with public, education and research, societal, funding and national and international development agencies to facilitate technology transfer, collaborate in commercializing and exploiting research and innovation and support building the necessary capacities and technical competencies required to achieve the objectives of the Strategy.

4.3 Implementation Mechanisms

The strategy will be implemented at continental, regional and national levels. At each level, programs will be co-designed, validated, implemented, communicated and evaluated. Member States will provide leadership to secure active participation and contribution by a critical mass of relevant public, private, education and research, societal, international development and funding sector stakeholders to co-design and implement the various flagship programs and initiatives resulting from STISA-2024 (Table 2). RECs and AU Member States will also coordinate with the AUC and NEPAD Agency in implementing the STI Strategy and submitting bi-annual implementation status reports to the STC on Education, Science and Technology.

International and continental development partner institutions (e.g. AfDB, UNECA) will collaborate with other stakeholders, including civil society and the media to support successful implementation of STISA-2024 by providing financial and technical assistance and aligning current and future programmes. They will also play important multiplier roles in popularizing the importance of research and innovation in Africa's development.

The private sector will work closely with public, education and research, societal, funding and national and international development agencies to support building the necessary capacities and technical competencies of Member States, RECs and other continental organisations required to achieve the objectives of the Strategy.

4.4 International Cooperation

In view of the importance of cooperation in repositioning STI in Africa, a number of existing partnerships between Africa and other continents and countries are managed within the African Union Commission. Bi-lateral and multi-lateral cooperation in STI (including ICT) between African Member States as well as with other countries outside Africa are increasing. STISA-2024 will promote mutually beneficial South - South and North – South cooperation to achieve its ambitious goals. This requires concerted effort among all participating and contributing actors (including researchers/scientists, Member States, RECS and African Union Commission) to ensure that such cooperation is primarily anchored around the African priorities indicated in this Strategy.

STISA-2024 will seek to build upon and further strengthen and nurture effective partnerships that complement existing African research infrastructure. It will endeavour to achieve scientific excellence, and improved competitiveness and innovation through cooperation between researchers including the African Diaspora and other international research and innovation stakeholders. It will also actively explore mutually beneficial structures for the inclusion of research and innovation calls under international research funding programmes such as the European Union Horizon 2020 that are not only open to African participation but also specifically address Africa's research agenda .

Intra-African and international bi-lateral and multi-lateral cooperation will be revitalized to ensure a robust STI component with agreed funding instrument(s) and performance metrics. Through these smart

partnerships, the stakeholders will be able to jointly mobilize and fund bilateral and multilateral projects and programs derived from the strategy. African engagement in international research and innovation programs will be monitored and critical performance indicators will be regularly reported.

Institutions		Priority	Key Domain	Flagship or Collaborative Program	Regional or National Program	Implementation
Assembly		Adoption				
Executive Council			Adoption			
Ministers	Other sectoral ministers conference		Harmonisation and Consolidation			
	AMCOST			Coordination		
African Union Commission			Overseeing Implementation			
	ASRIC			Development Conception		
	AOSTI				Monitoring of Implementation	
	Other organs, PAU, PAIPO					Implementation
NEPAD Planning and Coordination Agency			Support Technical Implementation and resource mobilisation			
RECS					Adoption and Monitoring	Implementation
Member States		State Organs			Funding	Implementation
		Private Sector				Implementation
International Private Sector						Implementation
AfDB and Others				Funding		
Development partners				Advisory, Funding, Implementation		

Table 1: Institutioanl Architecture for implementation of STISA-2024

Chapter 5

Funding Mechanisms

STISA-2024 offers the continent an opportunity to rapidly move towards an Innovation-led Knowledge-based Economy. The success of STISA-2024 depends on a number of factors, including increased R&D budgets at national, regional and continental levels.

Each Member State is encouraged to take concrete actions to allocate at least 1% of GDP to R&D to ensure that Africa maximises ownership and responsibility for its own developmental path. To ensure effective implementation of STISA-2024 at the regional and continental level, a strategy to mobilize domestic and alternative financial resources should be developed to accelerate implementation and reduce over-reliance on external resources.

5.1 National and Regional Funding

Some African Member States have demonstrated leadership in establishing National Funds for Research, Innovation as well as, in some cases, entrepreneurship. A number of Member States have also established bi-lateral STI calls for research proposals to promote research collaboration. It is essential that all Member States adequately prioritise investment in STI research and innovation as well as entrepreneurship.

At the national level, Member States are urged to streamline funding for STI, and entrepreneurship in their national development strategies and adapt existing STI polices to support implementation of STISA-2024.

At the regional level, RECs are encouraged to establish regional funds to support existing or new regional centers for excellence that respond to STISA -2024 priority areas as well as cross-border research and innovation collaboration addressing common challenges. These funds will drive regional initiatives, reinforce the impact of national initiatives of REC Members and ensure wider sustainability.

5.2 African STI Fund (ASTIF)

STISA-2024 recommends that domestic resources should be mobilised for STI research and innovation. External technical and financial support should help strengthen the domestic funding base, thus supporting sustainability. Further, there is urgent need to set-up an African Science and Technology Innovation Fund (ASTIF) as a pan African financial instrument. To ensure that the proposed ASTIF is sufficiently well endowed and functional, it is crucial that adequate financial resources are mobilized from the public and private sectors, funding communities both inside and outside Africa, and actively engaging other alternative sources of funding.

Illustration for Africa's STI funding potential

Africa has the potential to finance its STI development programs towards the 1% GDP allocation. The 2013 statistics of the five countries with highest STI expenditure illustrate this potential as follows:

- National Budget: Goal 1% of the GDP

- Partnership and Cooperation

- Financing research programmes as credible and bankable development projects

Countries	GDP	1% GDP
	(US $)	
Algeria	209 000 000 000	2 090 000 000
Angola	123 000 000 000	1 230 000 000
Egypt	246 000 000 000	2 460 000 000
Nigeria	520 000 000 000	5 200 000 000
South	335 000 000 000	3 350 000 000
Total (5 Countries)	1 433 000 000 000	14 330 000 000
All Africa	2 309 000 000 000	23 090 000 000

Source : Annuaire statistique pour l'Afrique / African Statistical Yearbook – BAD-UA-CEA / AfDB-AU-ECA

- Concerning Africa's potential, it is important to quantify investments lost through brain drain

Chapter 6

Communication and Publicity

Communication and outreach on STI are important to secure necessary political buy-in at government level, raise wider public awareness at grassroots level, and garner support from all key stakeholder groups. Public appreciation of STI is critical for successful implementation of STI policies and programs at national, regional and continent levels. Key stakeholders

(public, private, education and research, civil society, international development partners) need to be kept well informed on relevant programs. The practical and tangible benefits of STI must be communicated in simple, easy understandable language as case studies to build public trust and confidence. A comprehensive communication plan will be part of STISA-2024 and will contain, among others, the following:

6.1 Popularization of the Strategy

STISA-2024 will be popularized within AU structures, as well as national, regional and international research and innovation stakeholders. AU Member States and RECs must cooperate in developing appropriate and mutually reinforcing national and regional plans for STI communication and outreach activities. The STISA-2024 Communication and outreach Plan should encourage dialogue with the public using their local languages. A key aspect of communication and outreach is to regularly report progress and showcase local, national and regional achievements through case studies that have cross-border relevance and potential impact.

AUC, NEPAD and Member State STI communication and outreach programs should utilize a coordinated, multi-channel approach. In Africa, the perceived relevance of STI research and innovation by wider society is weak. In many Member States the public does not adequately appreciate how scientific and technological developments have improved the quality of their lives. To increase public appreciation of STI and its important role in sustainable socio-economic development, there is need to appoint high profile and credible STI Ambassadors and Research and Innovation Champions who can target different constituencies and sectors, develop programmes to build STI capacity in the media. Above all, it is essential to engage with youth communities, to help them develop entrepreneurial opportunities leveraging STI through skills development training, linkages with education and research stakeholders, mentoring by private sector stakeholders and other structured support mechanisms.

To achieve the goal of an "Innovation-led" development pathway in Africa, utilization of scientific (including Indigenous) knowledge is critical. For STI Ambassadors, Research and Innovation Champions, the media and youth communities to effectively advocate for STI, they need simple, straightforward and relevant messages. Advocates for STI Research and Innovation should be well-versed in the subject matter and have the communication skills to convey consistent messaging that clearly addresses the interests, concerns and previous exposure of target communities. More importantly, relevant, targeted information, communication medium and local languages are all essential elements for effective dissemination. The STISA-2024 communication strategy shall formulate communication training programmes that will empower advocates for STI, the public, policy makers and decision makers. Access to tailored, targeted information will help stimulate demand for STI Research and Innovation across different socio-economic sectors in Africa.

6.2 Scientific Knowledge Utilization

Scientific knowledge must build on the shoulders of the giants who came before us. Establishing a healthy, vibrant and sustainable Innovation Ecosystem, requires clear communication and knowledge sharing between all innovation stakeholders. This serves to reduce duplication of effort, increase research and innovation excellence and properly utilise scientific and technological knowledge to address societal challenges through innovative products, services, processes, business models and policies. The African STI community must also leverage the invaluable insight of Indigenous Knowledge that is often transferred orally from one generation to the next.

6.3 Awards and Recognition

Science, Technology and Innovation are at the top of Africa's development, cooperation and political agendas. In January 2007, the AU Heads of State and Government "declared 2007 as the launching year for building constituencies and champions for Science, Technology and Innovation in Africa". In response to this political momentum and commitment, STISA-2024 underscores the need for AU Member States, Regional Economic Communities and other key stakeholders to contribute towards raising the profile of science and technology sector and building a scientific culture amongst African citizens.

Chapter 7

Monitoring and Evaluation

The absence of a M&E system at the inception of the CPA made it difficult to demonstrate the achievements of the CPA and the contribution of STI in addressing Africa's challenges. There has been a limited focus on assessing how research efforts are contributing to solving the needs in agriculture, food and nutrition security, infrastructure, health, human capacity

development and poverty reduction.

STISA-2024 is a strategic intervention of Africa's STI sector in support of the AU Agenda 2063. It has adopted a cross-sectoral and multi-disciplinary approach which intends to strengthen the use of STI in addressing socio economic challenges. An important feature of STISA-2024 is that it has, at inception, embedded M&E mechanisms that will enable continuous performance assessment as programmes and projects are rolled out by stakeholders.

The M & E system will:

- Facilitate learning, transparency and accountability;
- Guide the design, implementation and review of policies and programs;
- Enhance the processes of embedding STI in all development sectors;
- Ensure appropriate STI indicators in all development sectors;
- Ensure effective communication and build trust among stakeholders;
- Strengthen knowledge generation, management and translation; and
- Support the implementation and coordination of STI programmes.

7.1 M&E Implementation Plan

The M&E Plan shall consist of a Conceptual framework which outlines the problem, major drivers of performance with regard to effectiveness and efficiency; and a Logical framework which links goals, objectives and actions. Links with the continental process for harmonisation of Statistics in Africa will also be established. The following will be undertaken to implement the M&E plan:

1. Definition of performance indicators - In consultation with national, regional and continental stakeholders, the NEPAD Agency, AOSTI and ASRIC will, as part of the M & E Planning, define a set of agreed targets and performance indicators (2014-2015);

2. Tracking performance - NEPAD Agency and AOSTI will track a minimum set of performance indicators at continental level to measure achievement of priorities set in the Strategy for the period 2014-2017. Each Member State and regional STI programme will incorporate a standardised monitoring and evaluation system to enable comparability of the Strategy for the period 2014-2016. The need for comparability should not exclude the identification of context-specific national and regional targets and indicators;

3. Integrated learning - Lessons learnt, good practices and unintended impacts will be systematically documented by responsible institutions at national and regional level to allow knowledge sharing and inform bi-annual reviews of the Strategy for the period 2014-2018. Based on lessons learnt, multi-stakeholder dialogues will be established to ensure positive feedback into planning at national, regional and continental levels (2016-2024).

7.2 Targets and Performance Indicators

Member States and RECs shall put in place an up-to-date and harmonised mechanism allowing both AUC (AOSTI) and NEPAD Agency to collect performance data annually, analyse the data, synthesize the reports, review progress and disseminate the results among the relevant stakeholders.

7.3 Risk Factors

Successful implementation of this Strategy is, to a large extent, dependent on the commitment and support from Member States and RECs. The awareness levels amongst all key stakeholder groups (including media the public) of the AU STI Strategy may not be sufficient to secure necessary buy-in. This risk will be mitigated by the AUC and NEPAD actively advocating and promoting the Strategy, and supporting regional and national awareness raising campaigns by RECs and Member States. An advocacy plan that outlines targeted messages for different stakeholder groups must be developed. The contribution and impact of STI and ICT in Africa's

development is currently not adequately assessed, recognized and prioritized in policy formulation. This risk should be lessened by integrating STI and ICT into all AU development frameworks, this response is expected to diffuse to national and regional initiatives. Finally, based on lessons learnt from implementation of the CPA, an evidence based approach must be implemented, establishing comparable baselines and performance metrics at national and regional level.

7.4 Success Factors

The Strategy relies on active engagement by 54 Member States, all the Regional Economic Communities and several international agencies, which reduces the risk of failure. It will lead to a strong political will and trust in the intellectual capacity of the sons and daughters of the continent. The proposed implementation mechanism is based on the experience gained over the last seven years of CPA that includes lessons learnt, best practices, failures and success stories.

On the wings of innovation

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