OACPS RESEARCH AND INNOVATION PROGRAMME

Policy Support Facility

MUTUAL LEARNING EXERCISE ON FORMULATING AND IMPLEMENTING RESEARCH AND INNOVATION POLICIES

Handbook on how countries can formulate and implement effective Research and Innovation policies

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OACPS R&I

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OACPS R&I PSF

Handbook on how countries can formulate and implement effective Research and Innovation policies

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List of Abbreviations

ACP	African, Caribbean, and Pacific
AfDB	African Development Bank
AFF	African Forest Forum
AUC	African Union Commission
AUDA	African Union Development Agency
CARICOM	Caribbean Community
CCST	Caribbean Council for Science and Technology
CDC	Centre for Disease Control
CGIAR	Consultative Group for International Agricultural Research
CTI	Climate Technology Initiative
ECOWAS	Economic Community of West African States
ECLAC	Economic Commission for Latin America and the Caribbean
EU	European Union
FFS	Farmer field schools
GDP	Gross domestic product
GERD	Government expenditure on research and development
GII	Global Innovation Index
IADB	Inter-American Development Bank
IATT	Inter-Agency Task Team on STI for SDGs
ICIPE	International Centre of Insect Physiology and Ecology
ICT	Information and communications technology
IF	Innovation fund
IKS	Indigenous knowledge systems
ILRI	International Livestock Research Institute
IPR	Intellectual property rights
KEMRI	Kenya Medical Research Institute
KENIA	Kenya National Innovation Agency
KIRDI	Kenya Industrial Research and Development Institute
KMFRI	Kenya Marine and Fisheries Research Institute
KotDA	Konza Technopolis Development Agency
LIC	Low-income countries
LMICs	Low- and middle-income countries
MEL	Monitoring, evaluation and learning
MINRESI	Ministère de la Recherche Scientifique et de l'Innovation
MLE	Mutual Learning Exercise
MoST	Ministry of Science and Technology
MRIC	Mauritius Research and Innovation Council
NACOSTI	National Commission for Science Technology and Innovation
NCRST	National Commission on Research, Science, and Technology
NCST	National Council on Science and Technology
NDP	National development plan
NEPAD	New Partnership for Africa's Development
NIA	National Innovation Agency
NSI	National system of innovation
NULIH	National University of Lesotho Innovation Hub

OACPS	Organisation of African, Caribbean and Pacific States
OECD	Organisation for Economic Co-operation and Development
PFAN	Private Financing Advisory Network
PNDES	National Economic and Social Development Plan
PSF	Policy Support Facility
R&D	Research and development
REC	Regional economic communities (African Union)
R&I	Research and innovation
RCMRD	Regional Centre for Mapping of Resources for Development
RIS3	National Research and Innovation Strategies for Smart Specialisation
S&T	Science and technology
SADC	Southern Africa Development Community
SAGA	STEM and Gender Advancement
SDGs	Sustainable Development Goals
STEM	Science, technology, engineering and mathematics
STI	Science, technology and innovation
STISA-2024	Science, Technology, and Innovation Strategy for Africa 2024
TAU	Technical Assistance Unit
TFM	Technology Facilitation Mechanism
ToC	Theory of Change
TRIPS	Trade-related aspects of intellectual property rights
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDAF	United Nations Development Assistance Framework
UNECA	United Nations Economic Commission for Africa
UNECE	United Nations Economic Commission for Europe
UNECLAC	United Nations Economic Commission for Latin America and the Caribbean
UNDESA	United Nations Department of Economic and Social Affairs
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNESCAP	United Nations Economic and Social Commission for Asia Pacific
UNESCWA	United Nations Economic and Social Commission for Western Asia
UN IATT	UN interagency task team on STI for the SDGs
UNIDO	United Nations Industrial Development Organisation
UNTBLDC	United Nations Technology Bank for Least Developed Countries
UNU MERIT	United Nations University - Maastricht Economic and Social Research Institute on Innovation and Technology
WIPO	World Intellectual Property Organization
WRI	World Resources Institute

Glossary of terms and definitions

Cross-cutting priorities

Priorities that have a broad impact across multiple sectors. In the context of R&I policies, cross-cutting priorities may involve addressing issues like renewable energy, which have relevance in various areas, such as energy, environment, and economic development.

Crowdfunding

A way of raising funds that enables fundraisers to collect money from many people via online platforms.

Global Innovation Index (GII)

Ranks the most innovative economies in the world.

Gross Domestic Product (GDP)

GDP counts all the output generated within the borders of a country. It measures the monetary value of final goods and services - that is, those that are bought by the final user - produced in a country in a given period (say a quarter or a year).

Gross Expenditure on Research and Development (GERD)

GERD refers to those expenses a company or country spends researching and developing new products or improving their current offerings.

Inclusivity

The practice or policy of providing equal access to opportunities and resources for people who might otherwise be excluded or marginalised, such as those having physical or intellectual disabilities or belonging to other minority groups.

Indigenous knowledge

Refers to understandings, skills, and philosophies developed by local communities with long histories and experiences of interaction with their natural surroundings.

Innovation

A new method, idea or product with commercial viability.

M-Pesa

Africa's leading mobile money service with more than 604,000 active agents.

Capacity building

The process of developing and strengthening the abilities, skills, and resources of individuals, organisations, or nations to achieve effectively their goals and objectives.

Data sharing

The practice of exchanging R&I-related data and findings among countries and the global research community.

Digital divide

The gap between those who have access to digital technologies and the internet and those who do not, often resulting in disparities in access to information and opportunities.

Economic growth

The increase in a country's production of goods and services, often associated with improved living standards, which can be driven by R&I.

Ecosystem mapping

The process of identifying and analysing the various actors and elements of the R&I ecosystem in countries, to better understand their strengths and weaknesses.

Emerging economy

A term used to describe a country that is transitioning from a less developed state to a more advanced and industrialised one.

Emerging technologies

New and rapidly advancing technologies, such as artificial intelligence and biotechnology, which can drive R&I advancements in countries.

Funding mechanisms

Financial strategies and mechanisms used to allocate resources for R&I activities, including government grants, venture capital, and international aid.

Human capital

The knowledge, skills, and expertise of individuals involved in R&I, a critical component of R&I capacity.

Inclusive decision-making

A process that involves the participation of diverse stakeholders, including government bodies, academia, industry, and civil society, in shaping R&I policies.

Information and communications technology (ICT)

Encompasses technologies related to computing, telecommunications, and the internet used for the processing, storage, and exchange of information.

International Livestock Research Institute (ILRI)

An organisation focused on improving livestock production, food security, and sustainable agriculture.

Innovation ecosystem

The network of organisations, institutions, and individuals that collaborate and interact to support and drive innovation within a region or industry.

Innovation index

A measure of a country's innovation capabilities and performance often used to assess R&I capacity.

Innovation policy

Government policies and strategies aimed at fostering a culture of innovation and supporting R&I activities.

Interdisciplinary collaboration

Collaboration between individuals and organisations from different fields and disciplines to address complex R&I challenges.

Knowledge exchange

The sharing of information, ideas, and best practices among ACP countries and the global R&I community.

Knowledge-based economy

An economy in which knowledge and information are key drivers of growth and productivity, often associated with strong R&I capacity.

National innovation framework

A comprehensive strategy or roadmap that guides a country's approach to innovation.

Open access

The practice of making research findings and data freely available to the public, promoting transparency and knowledge sharing in R&I.

Policy advocacy

Efforts to influence government policies and regulations to support and advance R&I capacity in ACP countries.

Policy framework

A set of guidelines and principles used by governments or organisations to inform decision-making.

Prioritisation

The process of determining the order of importance or urgency of various tasks, activities, or policies. In the context of R&I policies, prioritisation involves deciding which R&I activities should receive more attention, resources, and support based on their relevance and potential impact.

Public-private partnerships

Collaborations between government entities and private-sector organisations to jointly fund and execute projects or initiatives that serve the public interest.

Research and innovation (R&I)

The collective term encompassing activities related to scientific research, technology development, and the creation of new ideas, products, and services to drive economic growth and societal development.

R&I alignment

Ensuring that R&I policies are in harmony with broader national development goals and objectives.

R&I indicators

Quantitative and qualitative measures used to assess the performance and impact of R&I activities.

R&I infrastructure

Physical and organisational structures and facilities necessary to conduct R&I activities, including laboratories, research centres, and universities.

Social development

Improvements in the well-being and quality of life of a country's citizens, to which R&I can contribute through innovations in healthcare, education, and more.

Science, technology, and innovation (STI)

An acronym referring to the fields of scientific research, technological development, and the application of innovation to solve problems and create opportunities.

STISA-2024

Science, Technology, and Innovation Strategy for Africa 2024. A framework developed by the African Union Commission to promote science, technology, and innovation on the African continent.

Technology absorption

The capacity of a country or organisation to adopt and adapt technologies developed elsewhere for their own benefit.

Technology hub

A geographic area or institution that concentrates R&I activities, often attracting talent and investment.

Technology Facilitation Mechanism (TFM)

Part of the United Nations Sustainable Development Goals (SDGs), it aims to facilitate collaboration and partnerships among various stakeholders to advance science, technology, and innovation for sustainable development.

Technology transfer

The process of sharing and adopting technology and knowledge from one entity or context to another. In R&I policies, technology transfer may involve facilitating the movement of innovations, inventions, or research findings from research institutions to the private sector for commercialisation and broader societal benefits.

Preface

Research and innovation (R&I) are critical components to address pressing societal, environmental and economic challenges of our time. They play a crucial role in speeding up the green transition, generating new enterprises and jobs, and fighting against climate change and eradicating poverty. R&I rely not only on appropriate funding and expertise, but also on conducive policy framework conditions. Therefore, it is crucial for a country to develop evidence-based and tailored R&I policies with a collaborative approach and broad stakeholder participation to foster synergy within the R&I environment.

Acknowledging the transformative power of R&I and the importance of knowledge sharing and peer-learning among countries, the Secretariat of the Organisation of African, Caribbean and Pacific States (OACPS), in collaboration with the UN Interagency Task Team on STI for the SDGs Work Stream 6 on capacity-building (IATT WS6), held a Mutual Learning Exercise (MLE) to support countries in their efforts to formulate and implement transformative R&I policies. This initiative engaged government officials and managers responsible for R&I from different countries that have been supported either through the OACPS R&I Policy Support Facility (PSF) or UN agencies that form part of the UN IATT WS6 (such as UNESCO and UNCTAD) towards developing inclusive and evidence-based R&I policies. The countries involved in the MLE were Cameroon, Ethiopia, Gambia, Guinea, Kenya, Lesotho, Mauritania, Mauritius, Mozambique, Namibia, Seychelles, Tanzania, Timor-Leste, Togo and Zambia. The first exchange meeting took place in February 2023 in Addis Ababa, Ethiopia.

This Handbook represents the fruits of these cooperative endeavours and is designed as a comprehensive guide to enhance R&I policy-making and strengthen policy implementation. It unpacks areas of gaps in R&I policy formulation and implementation, and provides recommendations to foster transformative change. Embracing a policy cycle framework, the Handbook covers critical aspects of R&I policy, such as formulation and implementation, governance, funding, monitoring and evaluation, capacities and skills. It also examines inclusiveness and R&I prioritisation.

The central argument presented in this Handbook is that strengthening the aspects of the policy cycle is paramount to ensuring that R&I policies effectively contribute to economic, social and environmental goals in ACP countries and beyond. Through a stepwise approach, this Handbook makes provision to developing R&I policies that will facilitate ACP countries' competitiveness and trade at a global scale and tap into relevant value chains. The evidence and insights shared are based on a meticulous process involving secondary data analysis, literature reviews, meetings, workshops, and interviews with key R&I stakeholders, and validation sessions with participating countries.

The Handbook is developed within the framework of the OACPS R&I PSF, which was launched in January 2021 by the OACPS Secretariat under the OACPS R&I Programme and funded by the European Union. The primary objective of the PSF is to enhance the quality and efficiency of R&I policies and ecosystems in OACPS member states.

The OACPS Secretariat and the UN IATT WS6 strongly believe in R&I as key drivers of sustainable and inclusive development, but also in the crucial role that R&I policies play a in fostering development and synergising ACP countries towards the attainment of the UN 2030 Agenda for Sustainable Development 'Transforming our world', and the aspirations

of the African Union's Agenda 2063 'the Africa We Want'.

This also underlines the importance that the Heads of State and Government of the OACPS have placed on R&I for the socio-economic progress of member states and for achieving the objectives outlined in the revised Georgetown Agreement, the Samoa agreement governing the ACP-EU partnership, and its six key priorities: human rights, democracy and governance; peace and security; human and social development; inclusive, sustainable economic growth and development; environmental sustainability and climate change; and migration and mobility.

We express our gratitude to the experts and countries' representatives whose valuable contribution enriched the content of this Handbook.

We trust that this Handbook will be a valuable tool for policy-makers, practitioners, academics and other stakeholders committed to advancing R&I for sustainable development. May it inspire effective policy formulation, reforms, collaborative partnerships, and transformative change in R&I ecosystems across the OACPS region and beyond.

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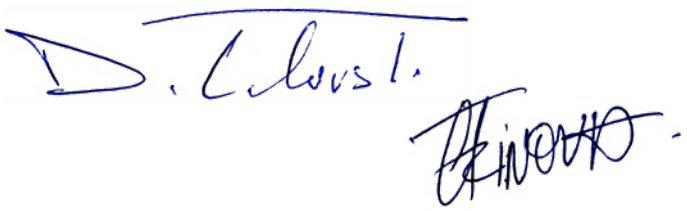

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Préface

La recherche et l'innovation (R&I) sont des éléments clés pour relever les défis sociétaux, environnementaux et économiques urgents de notre époque. Elles jouent un rôle crucial dans l'accélération de la transition verte, la création de nouvelles entreprises et de nouveaux emplois, ainsi que la lutte contre le changement climatique et l'éradication de la pauvreté. La R&I dépend non seulement d'un financement et de compétences appropriés, mais aussi d'un cadre politique propice. Il est donc essentiel que les pays élaborent des politiques de R&I fondées sur des données probantes et ciblées, avec une approche collaborative et une large participation des parties prenantes, afin de favoriser les synergies au sein de l'environnement de la R&I.

Reconnaissant l'importance des politiques de R&I et de l'échange de connaissances et d'expériences entre les pays, le Secrétariat de l'Organisation des États d'Afrique, des Caraïbes et du Pacifique (OEACP), en collaboration avec le Groupe de travail interinstitutions des Nations Unies sur la STI pour la réalisation des ODD sur le renforcement des capacités (UN IATT WS6), a organisé un exercice d'apprentissage mutuel (Mutual Learning Exercise -MLE) pour aider les pays dans leurs efforts pour formuler et mettre en œuvre des politiques de R&I transformatrices. Cette initiative a engagé des autorités publiques de haut niveau responsables de la R&I de différents pays qui ont été soutenus soit par le Mécanisme de soutien aux politiques de R&I de l'OEACP (MSP), soit par des agences de l'ONU qui font partie de UN IATT WS6 (telles que l'UNESCO et la CNUCED) pour développer des politiques de R&I inclusives et fondées sur des données probantes. Les pays participant au MLE sont le Cameroun, l'Éthiopie, la Gambie, la Guinée, le Kenya, le Lesotho, la Mauritanie, l'Ile Maurice, le Mozambique, la Namibie, les Seychelles, la Tanzanie, le Timor-Oriental, le Togo et la Zambie. La première réunion d'échange a eu lieu en février 2023 à Addis-Abeba, en Éthiopie.

Le présent manuel dit «Handbook» est le fruit de ces efforts de coopération et vise à constituer un guide complet pour améliorer l'élaboration et la mise en œuvre des politiques de recherche et d'innovation. Il met en évidence les lacunes dans la formulation et la mise en œuvre de la politique de R&I et fournit des recommandations pour favoriser un changement transformateur. S'inscrivant dans le cadre d'un cycle politique, le présent document couvre les principaux aspects de la politique de R&I, tels que la formulation et la mise en œuvre, la gouvernance, le financement, le suivi et l'évaluation, ainsi que les capacités et les compétences. Il examine également l'inclusivité et la définition des priorités en matière de R&I.

L'argument central présenté dans ce manuel est que le renforcement des aspects du cycle politique est primordial pour garantir que les politiques de R&I contribuent efficacement aux objectifs économiques, sociaux et environnementaux dans les pays ACP et au-delà. Grâce à une approche séquentielle, ce manuel permet de développer des politiques de R&I qui faciliteront la compétitivité et le commerce des pays ACP à l'échelle mondiale et qui leur permettront d'exploiter des chaînes de valeur pertinentes. Les données et les idées partagées sont issues d'un processus méticuleux impliquant l'analyse de données secondaires, des analyses documentaires, des réunions, des ateliers et des entretiens avec les principaux acteurs de la R&I, ainsi que des sessions de validation et d'échange avec les pays participants.

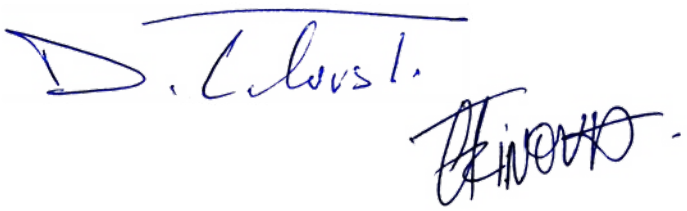
Le 'Handbook' est développé dans le cadre du MSP de R&I de l'OEACP qui a été lancé en janvier 2021 par le Secrétariat de l'OEACP dans le cadre du Programme de R&I de l'OEACP, et financé par l'Union européenne. L'objectif principal du MSP est d'améliorer la qualité et l'efficacité des politiques et des écosystèmes de R&I dans les États membres de l'OEACP.

Le Secrétariat de l'OEACP et le WS6 de l'UN IATT des Nations unies croient fermement que la R&I est un moteur essentiel du développement durable et inclusif, mais aussi que les politiques de R&I jouent un rôle crucial pour favoriser le développement et créer des synergies entre les pays ACP en vue de la réalisation de l'Agenda 2030 des Nations unies pour le développement durable « Transformer notre monde », et des aspirations de l'Agenda 2063 de l'Union africaine « L'Afrique que nous voulons ».

Cette initiative souligne l'importance que les Chefs d'État et de gouvernement de l'OEACP ont accordée à la R&I pour le progrès socio-économique des États membres et pour atteindre les objectifs définis dans l'Accord de Georgetown révisé, l'Accord de Samoa, régissant le partenariat ACP-UE et ses six priorités clés : droits de l'homme, démocratie et gouvernance ; paix et sécurité ; développement humain et social ; croissance et développement économiques durables et inclusifs ; durabilité environnementale et changement climatique ; et migration et mobilité.

Nous exprimons notre gratitude aux experts et aux représentants des différents pays participants dont les précieuses contributions ont enrichi le contenu de ce 'Handbook'.

Nous sommes convaincus que ce document constituera un outil précieux pour les décideurs politiques, les professionnels, les universitaires et les autres parties prenantes qui s'engagent à faire progresser la R&I pour le développement durable. Souhaitons qu'il inspire une formulation efficace des politiques, des réformes, des partenariats collaboratifs et des changements transformateurs dans les écosystèmes de R&I dans la région OEACP et au-delà.



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Executive Summary

Research and innovation (R&I) has been shown to be a core ingredient of the knowledge economy. Across the world, countries with more sophisticated R&I ecosystems, enabled by effective R&I policies, capabilities and skills, governance frameworks, and adequate investments, continue to lead in terms of economic growth and higher levels of technological development. R&I fosters countries' competitiveness and their abilities to compete globally. In addition, R&I improves the quality of life for millions of people around the world, while also helping to address pressing societal challenges, many of which are articulated in the SDGs. In several African, Caribbean and Pacific (ACP) countries, however, R&I ecosystems continue to underperform, resulting from weaknesses in R&I policies and policy-making, gaps in capabilities and skills, poor implementation outcomes, a lack of effective governance frameworks needed to support coordination and reduce fragmentation, and inadequate investments. These weaknesses have continued to hinder the ability of several countries to reap the benefits of R&I, enhance their economic growth potential, and achieve higher levels of technological development.

Against this backdrop, the Secretariat of the Organisation of African, Caribbean and Pacific States (OACPS) launched a Mutual Learning Exercise (MLE) on formulating and implementing research and innovation policies and strategies, under the Policy Support Facility (PSF) of the OACPS R&I Programme, funded by the European Union, with the participation of 15 countries. The resultant Handbook starts by providing the background and justification as to why ACP countries must improve their ability to formulate, implement, evaluate, and govern effective R&I policies and strategies, as a means of tacking the multiple and complex development challenges facing the region. In doing this, the Handbook has covered key topical areas identified by the countries involved in this MLE as fundamental to their ability to better exploit R&I for their socioeconomic development. The topics covered, informed by the policy cycle framework, are R&I policy formulation and implementation, funding, monitoring, evaluation, and learning (MEL); capacity and skills, inclusiveness, prioritisation, and alignment of R&I policies with other policies, governance, and lastly, politics and power relations in R&I policy-making.

The central argument is that enhancing these aspects of the policy cycle is vital to ensuring that R&I policies contribute more effectively to economic, social and environmental goals in ACP countries, and beyond. The evidence presented in the Handbook is based on secondary data gathered from a review of relevant literature, workshops and interviews with key R&I actors and stakeholders, peer reviews and validation sessions involving participating countries. The insights gathered are summarised under seven key messages, presented below. In addition to the key messages, the Handbook contain two sets of recommendations: a) recommendations that are specific to each of the topics covered, these are presented under the relevant chapters, and b) overarching recommendations that are cross-cutting, which are presented in **Chapter 10**. Hence, the Handbook outlines a stepwise approach to developing R&I policies, strategically designed to bolster the competitiveness of ACP countries, enabling global trade engagement, and their effective integration into relevant value chains.

Key messages

- All countries examined in this Handbook recognise and acknowledge the importance of R&I in their development, hence the need for R&I policies to help drive the relevant programmes, projects, and initiatives. In Seychelles, for example, the priority is to "embed science, technology, research and innovation into the socio-economic transformation to help spur knowledge-driven and value-added sustainable growth for improving the quality of life of its people". Other countries have similar ambitions and aspirations, which in sum, seek to harness research and innovation for development in ways that support the transition to knowledge-based economies in the ACP region.

- This heightened understanding and appreciation of the importance of R&I in development means that most countries currently possess R&I policies (or an equivalent in the form of science, technology, or innovation (STI) policies). The presence of these policies is evidence of progress in R&I policy formulation. However, implementation, MEL, and governance of these policies remain areas with critical challenges that require urgent attention.

- The absence of governance frameworks, or weaknesses in governance where frameworks do exist, mean that opportunities for transformative change through R&I continue to be hampered by difficulties in collaboration and coordination and poor accountability measures.

- Related to this, an inability to co-create R&I policies with a broader stakeholders' base, coupled with fragmentation in implementation, inadequate M&E, and the governance weakness outlined above, all pose key challenges to harnessing the development impacts of R&I policies.

- To this end, it is essential that coordination and cooperation challenges and barriers to interactive learning among stakeholders be addressed, as these hinder R&I policies. These areas of concern require urgent attention by national innovation system (NSI) actors and stakeholders, working together in a participatory and co-creation mind-set to find inclusive and sustainable solutions that are long-term and focus on systems change.

- There is a growing recognition of the necessity to reassess capacity and funding for R&I in ACP countries, emphasising the increased participation of the private sector. This calls for increased investments in R&I by governments and private sector actors. This may be achieved by establishing or strengthening platforms that direct R&I towards growth enterprises, for example through enhancing infrastructure support for innovation and technology hubs in aspects such as prototyping tools.

- Finally, there is an increased tendency and renewed efforts towards an inclusive approach to R&I policy formulation. This involves not only gender equality but also promoting frugal and grassroots innovation and embracing traditional and indigenous knowledge systems to leverage better impacts from R&I solutions in community contexts. Achieving this must take into consideration the role of politics and power, and the agency of marginalised actors and stakeholder groups.

1 Introduction and Background

This chapter provides a comprehensive overview of the Handbook, offering a brief background on its relevance and significance. It also includes a brief overview of the OACPS Research and Innovation Policy Support Facility (PSF) and the Mutual Learning Exercise (MLE) process. This overview includes the methodology used, the guiding conceptual framework, and a brief explanation of the chosen topics. This chapter ends with information on how the Handbook is organised, to help guide readers. **This Handbook was developed with input from high-level authorities responsible for R&I in fifteen countries**, including **Cameroon**, **Ethiopia**, **Gambia**, **Guinea**, **Kenya**, **Lesotho**, **Mauritania**, **Mauritius**, **Mozambique**, **Namibia**, **Seychelles**, **Tanzania**, **Timor-Leste**, **Togo** and **Zambia**. **Annex 1** contains the list of experts and authorities who contributed to the Handbook, while **Annex 2** outlines the detailed methodology employed for its development.

1.1 WHY THIS HANDBOOK?

Research and Innovation (R&I) are fundamental to economic growth, social progress, and the development of nations. Evidence for this abounds across the world, with a direct correlation between R&I (alongside Research and Development (R&D) investments) and countries with high incomes. For example, the Global Innovation Index (GII) 2022 shows that there is a positive relationship between innovation and development – countries with higher R&I performance have a higher GII score and GDP per capita (WIPO, 2022)[1]. This important role of R&I is supported in Africa (see Africa Innovation Outlook III AUDA-NEPAD, 2019) the Caribbean (Dohnert et al, 2023[2]; ECLAC, 2022) and Asia Pacific[3].

In recent decades, like R&I, science, technology, and innovation (STI) have been stressed as key elements underpinning Africa's long-term development agenda, as encapsulated in Agenda 2063, The Africa We Want (AUC, 2015), which emphasises STI as an essential ingredient to Africa's industrialisation ambitions (AfDB/OECD/UNDP (2017). To this end, the African Union Commission (AUC) has put in place the Science, Technology, and Innovation Strategy for Africa 2024 (STISA 2024), as one instrument to promote STI, R&D Correspondingly, policies and strategies have been developed at the level of Regional Economic Communities (RECs)[4] in Africa, alongside national STI policies.

A growing number of African, Caribbean and Pacific (ACP) countries face an urgent need to industrialise and achieve rapid economic growth. Economic growth is vital as ACP countries strive to improve the livelihoods of their citizens – enabled by robust infrastructure that supports health, energy, environment and food security – and boost employment opportunities while leveraging their demographic dividends (AUC, 2014). The AUC Agenda 2063 vision speaks of a prosperous Africa based on inclusive growth and sustainable development, premised on "*well-educated and highly skilled resources, with science, technology, and innovation being the bedrock of the countries' inclusive educational systems*" (AUC, 2014).

1 Source: GII, 2022, https://www.globalinnovationindex.org/userfiles/file/reportpdf/gii-full-report-2022.pdf
2 See also: https://www.iadb.org/en/news/idb-report-finds-caribbean-businesses-need-more-innovation-and-productivity
3 See for example https://artnet.unescap.org/sti/about for the various initiatives on STI for development in the region by the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP).
4 For example, ECOPOST for West Africa, ECOWAS; and for SADC, Protocol on Science, Technology, and Innovation (2008).

In the Caribbean and Pacific States, various initiatives have been set up and efforts are being made to foster R&I. These initiatives include both public and private actors. For example, in 2007, the Caribbean Council for Science and Technology (CCST) developed the Caribbean Regional Policy Framework for STI, with a view to fostering sustainable development (CARICOM, 2007). In addition to specific actions on policies and programmes, the region is also involved in several strategic partnerships on R&I[5]. As regards private sector participation, actors such as the Inter-American Development Bank (IADB) have also been involved in charting new pathways for innovation in the region (see for example, IADB (2016)). In summary, there is a strong recognition that innovation is central to the development of the Latin America and Caribbean region (ECLAC, 2022). In the Pacific, there is also strong recognition of the importance of R&I for the economic growth and sustainable development of the region as evidenced by the Asian Development Bank (ADB)[6]. While other actors, such as the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), are also promoting STI policies in the region[7].

Despite these efforts on R&I-related interventions and policies, and progress in institution building in ACP countries, several gaps remain in the formulation, implementation, funding, evaluation, and governance of R&I policies. In addition, weaknesses in capacity and low levels of political commitments[8] continue to hinder progress in the implementation of R&I policies. Furthermore, challenges persist in areas such as inclusivity, prioritisation, transformation failures, and impacts. This Handbook underscores the importance of R&I policies in national development, unpacks these gap areas and provides recommendations on possible approaches to address them, with the aim to foster transformative change. R&I policies also play a crucial role in fostering development and synergising ACP countries towards the attainment of the UN Agenda and its 17 Sustainable Development Goals (SDGs).

Therefore, the Handbook makes provisions through a stepwise approach to developing R&I policies that will facilitate ACP countries' competitiveness and enable them to trade globally and tap into relevant value chains. In this regard, effective R&I policy formulation and implementation that are adequately directed towards achieving the desired national development objectives (that is, addressing directionality failures) are key. The critical imperative lies in the harmonisation of policies at both national and regional levels, necessitating the integration of wide R&I policies into national frameworks. This addresses the prevailing gap between R&I policy formulation and effective implementation.

As part of addressing directionality, there is a need to emphasise budgetary commitments by governments to fund R&I initiatives nationally and regionally through infrastructure projects, national research and innovation funding, and other instruments. Another area of importance is the regular review of national

5 For example, the "new European Commission Research and Innovation programme for African, Caribbean and Pacific (ACP) countries, launched in 2021. The programme is worth €60 million and will be implemented between 2021-2025", https://research-and-innovation.ec.europa.eu/news/all-research-and-innovation-news/new-ri-programme-african-caribbean-and-pacific-acp-countries-2021-04-20_en

6 See for example, "Economic Growth and Sustainable Development in the Pacific Island Countries", https://www.adb.org/publications/economic-growth-and-sustainable-development-pacific-island-countries

7 https://artnet.unescap.org/sti/about

8 Various reasons account for this, including factors such as low prioritisation of R&I and hence inadequate funding, inability of the R&I ecosystem to demonstrate impact, and poor linkages and collaboration among the R&I ecosystem actors and stakeholders.

and regional R&I policies in line with national socio-economic development needs and development strategies. The Handbook, therefore, informs a unified approach with common goals mainly centred on attaining the SDGs in ACP countries.

It is crucial to underscore that R&I policies should not only effectively address current challenges but also exhibit the necessary technical sophistication and strategic foresight to navigate and overcome emerging complexities. This involves aligning with global objectives such as the SDGs. In this context, the technical enhancements and nuanced insights gathered from direct experiences in many ACP countries, as presented in this Handbook, become even more critical for policy-makers and practitioners in the field. This is because R&I continues to contribute to finding solutions to the major challenges of our time, including climate change, poverty, food, water and energy insecurity, loss of biodiversity, pollution and play an essential role in the response to current and future challenges[9]. R&I is also a critical lever that helps ensure sustainable and inclusive recovery, while boosting the resilience of production sectors, the competitiveness of economies and the transformation of socio-economic systems[10].

BOX 1 :
Treatment of R&I and STI policies

In the discussions that follow in the Handbook, the authors take the broad definitions and interpretations of R&I and STI. Although the framing and terminology of "STI policies" is more widely used in the ACP countries and context, "R&I policies" instead of "STI policies" is retained in this Handbook. This is because participants from the ACP countries who were consulted in the process of writing this Handbook confirmed that STI is often used interchangeably with R&I in their respective countries and contexts, therefore conveying the same broad meaning. In addition, the trend in many ACP countries is a move from science and technology (S&T) to STI or innovation policies, ministries and agencies; with the retention of "innovation policies" viewed as the future frontier. Equally important to note is the fact that some ACP countries now have STI alongside R&I ministries, agencies, structures or policies. Hence, while acknowledging the conceptual difference between R&I and STI, we use the terms R&I and STI policy interchangeably, in alignment with their usage in the referenced documents.

9 R&I in times of crisis, European Commission (2021), https://research-and-innovation.ec.europa.eu/system/files/2021-05/ec_rtd_quarterly-ri-review_012021.pdf

10 The role of research and innovation in support of Europe's recovery from the Covid-19 crisis (EC, 2020), https://research-and-innovation.ec.europa.eu/knowledge-publications-tools-and-data/publications/all-publications/role-research-and-innovation-support-europes-recovery-covid-19-crisis_en

1.2 THE OACPS R&I PSF

About OACPS R&I Policy Support Facility

This Handbook on *how countries can formulate and implement effective research and innovation policies and strategies* has been prepared within the framework of the OACPS R&I PSF. The OACPS Secretariat launched the PSF in January 2021 within the framework of the OACPS R&I Programme (oacps-ri.eu), with funding from the European Union (EU). The objective of the PSF is to support OACPS member states in enhancing the quality and efficiency of their R&I policies and ecosystems. The PSF is a demand-driven policy support tool that responds to requests for national R&I policy reforms and implementation from high-level R&I authorities from OACPS member states. Through a coherent and systematic approach, it offers tailor-made services that are based on country needs, and are impact-oriented and evidence-based. In operationalising the PSF, high-level international experts with expertise in relevant R&I fields and peers from (mainly) ACP and EU countries are mobilised to carry out the services and provide concrete advice and recommendations to formulate, implement or evaluate reforms in the field of R&I. To reiterate, the goal is to enhance the quality and the effectiveness of the R&I policy and systems.

Mutual Learning Exercise on R&I strategies and policies

The 'Mutual Learning Exercise' (MLE) is a specific service of the PSF that brings together a selected number of countries seeking to explore R&I topics of mutual interest. It fosters knowledge-transfer through a structured exchange of good practices and an exploration of the most effective way to tackle the identified policy challenges.

Innovation relies not only on appropriate R&I funding and skills, but also on putting in place the right policies and ensuring adequate framework conditions. It is fundamental for a country to develop tailored-made R&I strategies and policies, with a collaborative approach, that could bring synergy to the R&I environment. With a well-coordinated R&I system, funding can be sourced and progress made in R&I. Countries often face challenges not only in the development but also especially in the implementation of these policies and strategies, as policies are ineffective without implementation. In this framework, different countries in Africa (such as Lesotho, Mauritania, Cameroon, and Guinea) have already been supported by the OACPS R&I PSF towards developing inclusive and evidence-based R&I policies or strategies. Other international organisations, such as UNESCO and UNCTAD, are also supporting countries in reviewing, reforming and enhancing their national R&I ecosystems and policies from different perspectives.

Given that countries may encounter similar challenges, this MLE allowed countries to share policy experiences and identify success factors and good practices for the development and implementation of effective R&I policies and strategies that achieve their intended transformative outcomes. The MLE service served as an opportunity to assess current or planned policies and share good practices at the ACP country level and beyond. Policy-makers participated in exchanging experiences in designing specific R&I policies and strategies, providing roadmaps for R&I in ACP countries.

Fifteen countries actively participated in various activities of this Mutual Learning Exercise: Cameroon, Ethiopia, Gambia, Guinea, Kenya, Lesotho, Mauritania, Mauritius, Mozambique, Namibia, Seychelles, Tanzania, Timor-Leste, Togo and Zambia.

Hence, this MLE created a platform for countries to ***exchange knowledge and experiences*** on how to successfully develop and implement R&I policies and strategies, with the aim of strengthening current and future R&I initiatives. It also fostered the establishment of ***networks*** and new partnerships between countries and in collaboration with relevant UN agencies. Inclusive knowledge exchange and capacity building are prerequisites for the formulation of comprehensive R&I policies and for the set-up of coherent framework conditions that can lead to a successful implementation. Hence, the MLE also included a ***capacity reinforcement component*** conducted in collaboration with the UN-Interagency Task Team on Science, Technology and Innovation for Sustainable Development Goals working group on Capacity-Building (UN IATT Work Stream 6).

BOX 2 :
Background of UN-IATT WS6

The 2030 Agenda for Sustainable Development and the Addis Ababa Action Agenda highlight the importance of science, technology and innovation (STI) policies and actions for meeting the SDGs. The Technology Facilitation Mechanism (TFM) and its UN Interagency Task Team on STI for the SDGs (IATT) were established in order to mobilise STI solutions for attaining the SDGs.

The IATT is composed of diverse entities, including UNCTAD, UNIDO, UNESCO, UNU MERIT, WIPO, UNDESA, UNEP, UNESCWA, UNECA, UNECLAC, UNECE, and UNESCAP among others. The IATT's Work Stream 6 (WS6) is responsible for STI for SDG capacity building, designing and delivering training courses and workshops on STI policy for the SDGs addressed to policy-makers and key STI managers from developing countries.

WS6 has delivered two pilot regional in-person trainings (for Arab States and Central American Countries) and five series of online trainings (2020-2022) that benefited over 800 officials from over 90 countries. Resources and more information about the training can be found on the IATT WS6 website[11].

11 https://sdgs.un.org/tfm/interagency-task-team/capacity

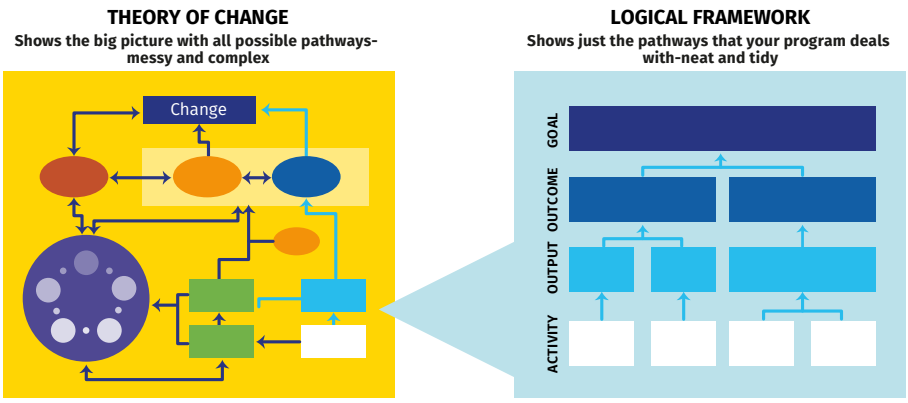
1.3 GUIDING CONCEPTUAL AND THEORETICAL FRAMEWORK

The ideas and discussions in this Handbook are guided by the national system of innovation (NSI) framework popularised by the seminal work of Chris Freeman (Freeman, 1987) and other scholars including Nelson (1993), Edquist (1997) and Lundvall (2010), alongside works such as the OECD Manuals on guidelines for measuring, collecting, and interpreting innovation data and activities. On the policy front, the NSI has also been widely adopted and utilised by the OECD (2004), the UN (UNCTAD, 2019) and various ACP countries (Daniels et al, 2020, 2021; AUDA-NEPAD, 2019). In line with the NSI, this Handbook draws on the concepts of interactive learning among actors, stakeholders and networks involved in innovation activities, linkages, and capacity essential for supporting innovation[12].

Recent work in innovation policy has extended the theoretical underpinning from a Frame 1 (R&D) and Frame 2 (NSI) to a Frame 3 (Transformative Change) approach, which argues for a stronger focus on addressing pressing social and environmental challenges, as emphasised in the SDGs, alongside the need to achieve economic goals (Daniels et al, 2020; Schot and Steinmueller, 2018). The 'innovation for transformative change' ideas and approach to innovation policy, referred to as a transformative innovation policy (TIP) approach, build on early works that laid the foundations for innovation studies, notably the Frascati and Oslo Manuals.

The TIP approach emphasises a Theory of Change (ToC) that is based on long-term systemic change. In this regard, the ToC helps to identify and address the systemic causes of challenges that hinder development impacts from innovation. It also helps to guide decisions on which approach should be taken, considering comparative advantages, effectiveness, feasibility, and uncertainties that are part of any change process. In this sense, a ToC also helps to identify the underlying assumptions and risks that are vital to ensuring that innovation, or the TIP approach in this context, will contribute to the desired change (UNDAF, 2014). **Figure 1** below helps to demonstrate the distinction between a ToC and the logical framework (log frame) approach and the pathways to achieving the desired change, by placing emphasis on a more comprehensive ToC approach.

Figure 1 **Distinction between the Theory of Change and the Logical Framework**



Source : https://tools4dev.org/wp-content/uploads/Theory-of-change-vs-Logical-framework1.png

12 See **Annex 4** for details on the research design and method that underpinned the findings in the Handbook.

1.4 THE TRANSFORMATIVE INNOVATION POLICY FRAMEWORK

The transformative change approach to R&I policy calls for the reimagining and redirection of R&D and NSI towards long-term systemic change and the type of development paradigm articulated in the SDGs, which emphasise the three dimensions of economic, social and environmental progress that is inclusive and sustainable. This requires a new approach to the ToC that focuses on directionality, underpinned by co-creation of solutions, a broader set of actors and stakeholders, and goes beyond the traditional logical framework of inputs and outputs to focus on transformative outcomes, experimentation with demonstrations, and formative evaluation.

Transformative innovation policy (Daniels et al., 2020) and its associated framework attempt to redirect the innovation discourse and policy-making towards meeting social and environmental needs beyond economic growth. There is already an emphasis within the transformative innovation policy framework that, instead of imitating the growth-centred model of the Global North, the Global South needs a shift in its policy direction towards the quality of growth itself. Issues of directionality, transformation as long-term systemic change, inclusion, sustainable economic growth and consideration for the SDGs are advocated in R&I policies and policy-making – as future areas of attention. These ideas of directionality, transformation, inclusion, and sustainability shape the discussions in the remainder of this Handbook.

Approaches to R&I policy formulation have been widely publicised (OECD, 2011) in the World Bank, UN, EU, and other global institutions. However, these approaches may not be the best fit for many ACP countries that are at a different developmental stage to the OECD countries. For example, the EU, through the Joint Research Centre (JRC), leads an important work on STI for SDGs Roadmaps, which are seen as a practical approach that takes a step-by-step guide to diagnosing the status of the national ecosystem. This is followed by stakeholder engagements that help to establish the key issues within the NSI. Thereafter, evidence gathered is used to inform R&I policy formulation in ways that that contribute to addressing systemic challenges in the NSI. This is followed by designing, through co-creation with the users, R&I policy instruments that carry the aspiration of users, with clear monitoring and evaluation processes and relevant measures in place.

Approaches such as transformative change or TIP, and STI for SDGs Roadmaps provide further learning opportunities for ACP countries as they strengthen their efforts to formulate and implement R&I policies that are more effective and achieve the desired transformative outcomes. In doing this, it has also become apparent that R&I policy formulation needs to be aligned with international policies for synergies, e.g., as the world gears towards the attainment of the SDGs, alongside the need to create linkages to national and regional R&I polices with the aspirations of the SDGs.

1.5 HOW THE HANDBOOK IS ORGANISED

Following this introduction chapter, the rest of the Handbook is organised around eight (8) topics and chapters: **2)** policy formulation and implementation, **3)** funding, **4)** monitoring and evaluation (M&E), **5)** capacity, **6)** inclusiveness, **7)** prioritisation, **8)** governance and **9)** politics. The last chapter, **Chapter 10**, concludes the Handbook. The chapters respond to and are organised in line with the broad categorisation advanced by the policy cycle – formulation (or agenda setting, which covers prioritisation), implementation, monitoring and evaluation (or review), and governance. The topics were determined in consultation with the 15 ACP countries that participated in the MLE[13] in the workshop held on 14-17 February 2023 in Addis Ababa, Ethiopia[14]. Also present at the MEL workshop were participants from the African Union Commission, OACPS PSF, and UN IATT WS6. The eight topics emerged as priority areas, in response to the challenges expressed by the countries and other stakeholders present at the workshop. In line with the aim of this Handbook, therefore, the topics covered are intended to address the gaps in R&I policies and strategies in ACP countries, but with wider implications and applicability in countries beyond the ACP region.

In unpacking the discussions under each of the chapters, the Handbook provides an overview and background on the respective topics, followed by the key issues, that is, challenges and barriers to effective deployment of R&I policies in ACP countries. Next, the chapters discuss interventions that have been deployed to help address the challenges, alongside opportunities for transformative change, with a view to tackling these challenges through R&I and R&I policies. Thereafter, case studies are presented to help contextualise the issues in the respective ACP countries examined. Tools and policy instruments are discussed next. This is because, to foster R&I for development, various tools, mechanisms, and policy instruments are employed to support programmes, projects, and initiatives. Effective leveraging of R&I tools and policy instruments can help unlock innovation potentials, address societal challenges, and propel inclusive and sustainable development. Each chapter ends with recommendations which, if operationalised, can help foster R&I for development impacts, as aspired to in ACP countries.

Chapter 2: Policy formulation, and more importantly implementation, is central to the objective of the OACPS MLE service. This chapter cover challenges, best practices and opportunities for transformative change in ACP countries through more effective formulation and implementation of R&I policies and strategies. The arguments for why policies, strategies and frameworks are particularly needed in ACP countries are provided, as these underpin vital development interventions, transformative outcomes and impacts. The key message is that although significant progress has been made in policy formulation in ACP countries, major weaknesses remain in implementation. The insights captured also provide the basis for addressing gaps in other aspects of the policy cycle, beyond formulation and implementation of policies, such as funding, MEL, governance and communications among R&I actors and stakeholders.

13 The list of participating countries that participated in the MLE includes Cameroon, Ethiopia, Gambia, Guinea; Kenya, Lesotho, Mauritania, Mauritius, Mozambique, Namibia, Seychelles, Tanzania, Timor-Leste, and Zambia.

14 Mutual Learning Exercise on Research and Innovation Strategies and Policies: Knowledge Exchange Meeting and Capacity-building, https://sdgs.un.org/events/mutual-learning-exercise-research-and-innovation-strategies-and-policies-knowledge-exchange

Chapter 3: R&I funding, which is critically important for R&I across ACP countries, needs to move from mere rhetoric to practice. Effective financing of innovation remains a major challenge. In Africa, for example, gross expenditure on research and development (GERD) has persistently remained below the 1% level recommended in the Lagos Plan of Action in 1980, and reaffirmed over the years in frameworks such as STISA-2024. Similar to the Africa region, low funding for R&I remain a major hindrance to innovation and development in Caribbean and Pacific regions, requiring urgent interventions. This chapter examines R&I funding issues, unpacks to what extent existing initiatives and instruments have been effective (or not), discusses case studies of good practice, and provides tools and recommendations that might help address the gaps.

Chapter 4: Evidence from the countries involved in the MLE revealed that they all face challenges in monitoring, evaluation and learning (MEL). Weaknesses in MEL hinder the potential for learning and innovation, which is vital to improving policy processes involved in formulation, implementation, and governance. The gaps in MEL provide a strong basis for the emphasis on this topic. In addition to unpacking the principles, challenges and good practices on MEL, this chapter also covers indicators and metrics, as these provide the building blocks and data to support effective MEL in R&I policies and strategies development.

Chapter 5: Capacity and skills for R&I policy-making, examines the need to strengthen R&I capacity and skills. Inadequacy of R&I capacity and skills remains a pressing challenge across ACP countries. This chapter focuses on existing avenues for strengthening existing capacity while also providing insights on building capacities where they are currently lacking.

In **Chapter 6**: Inclusiveness, as covered in the Handbook, underscores that the world is currently in the SDGs era, highlighting that universal acknowledgment of inclusiveness and leaving no one behind is pivotal. The positive impact of inclusiveness on the R&I ecosystem is also emphasised. However, despite this increased emphasis on inclusion, globally, the R&I field, covering the STI and STEM fields, remains highly exclusive and with huge inequalities. Therefore, this chapter delves into the challenges related to indigenous knowledge, gender, youth, and other types of innovation beyond product and processes (including grassroots, frugal, and social innovation).

Chapter 7: Prioritisation, highlights that the plethora of developmental challenges faced by ACP countries result in difficulties in deciding what priorities that R&I policies should focus on. Faced with scarce resources and shrinking fiscal spaces in these countries, the imperative to prioritise areas of focus with the highest potentials for transformative change becomes essential. This chapter explores issues related to prioritisation and provides recommendations on the ways forward.

Chapter 8: Governance – which covers coordination of R&I ecosystems, actors, and stakeholders in ACP countries – features as a consistent finding in scholarly publications, and policy and project reports. Effective governance of the NSI actors and stakeholders is vital to reduce weaknesses in coordination, fragmentation and to strengthen R&I linkages. This chapter examines issues of governance and the extent to which improvements in governance may help foster coordination, interactions and linkages, collaboration, cooperation, and partnerships among R&I actors and stakeholders in ACP countries. The role of governance in policy is extremely impor-

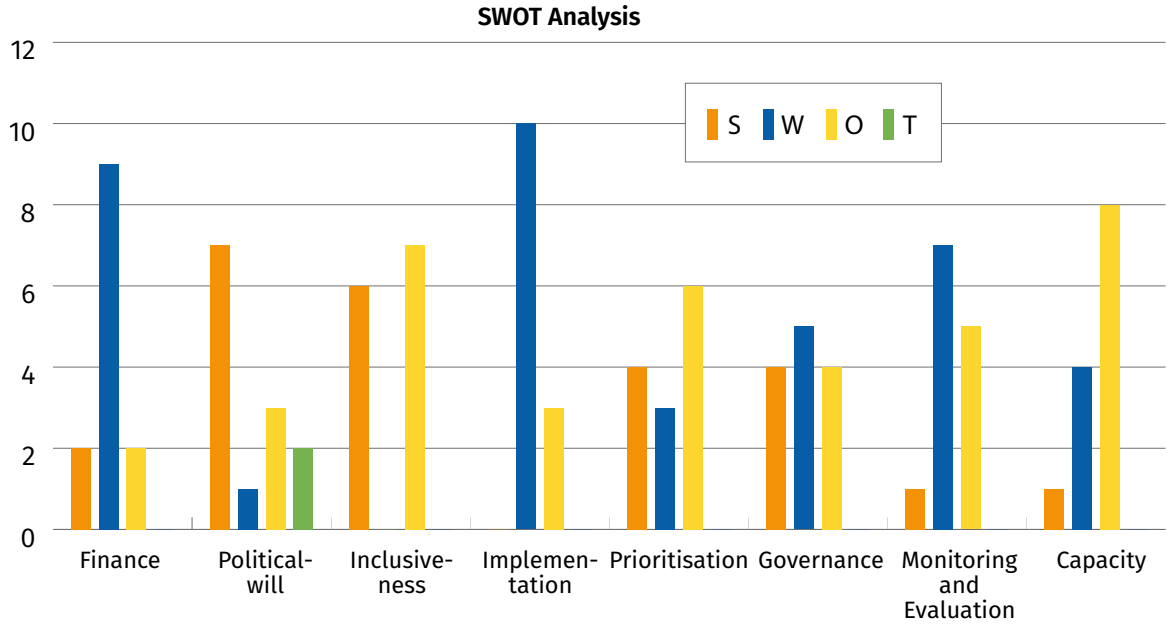
tant as it influences every other stage of the policy cycle. Therefore, focused attention on improving governance will significantly contribute to progress in policy-making and impacts from R&I policies.

Chapter 9: Politics in the Handbook delves into the intricate dynamics of politics and power in relation to the relevant R&I ecosystems, as these have considerable influence over the formulation, implementation, governance, and outcomes of related R&I policies. The insights presented contribute to a deeper understanding of the roles that politics and power play in policy-making. Specific aspects, such as political will versus commitments, and support mechanisms from government actors in the formulation, implementation, MEL and governance of R&I policies, are examined in ways that help foster transformative outcomes and desired development impacts.

Chapter 10: The Conclusion, winds up the Handbook with key messages, concluding remarks and recommendations that chart the way forward for action. In addition to the concluding remarks and key messages, two groups of overarching recommendations are provided. The first group is directed at ACP countries, to be operationalised by national actors such as government ministries, departments or agencies with a direct mandate and oversight of R&I policies, while the second group is designed to be operationalised by international actors and development partners such as the OACP Secretariat, UN agencies, the European Commission, and the World Bank.

Based on interviews, questionnaires and meetings, evidence from participating countries of the MLE revealed significant vulnerabilities in the formulation and implementation of R&I policies, coupled with challenges in funding, monitoring and evaluation (see **Figure 2**). Despite these main weaknesses, the growing political will to support the formulation and implementation of R&I is encouraging. It indicates that countries are increasingly aware of the essential role R&I plays in economic development and improved social well-being.

Figure 2 **Countries SWOT analysis of the identified key areas in R&I formulation and implementation**



Source: Compiled by the authors based on information gathered from interviews conducted in various countries.

2 Research and Innovation Policy Formulation and Implementation

As discussed in **Chapter 1**, R&I policy formulation and implementation are the focus of this MLE, hence the important attention paid to this topic. Against this backdrop, this chapter discusses challenges, practices and opportunities for transformative change in ACP countries through more effective formulation and implementation of STI policies and strategies. The insights captured also address related aspects such communications among STI policy ecosystem actors and stakeholders in the formulation and implementation of policies.

2.1 OVERVIEW

Policies, strategies, and regulations are critically important in ACP countries and developing countries' contexts where, for example:

a. the institutions are often weak, still under development, and often not adequately resourced, for example, in terms of funding, capacity and political commitments;

b. having explicit policies in place is essential to the allocation and disbursement of funds and resources for implementation. This is because a costed policy provides clarity to governments and funding agencies on what resources to provide, when such resources are available. However, there are cases where funds specified in policies, or allocated, are not disbursed. This might result from resource scarcity, gaps in prioritisation (see **Chapter 7**), weakness in political commitments, or other factors;

c. the implementation modalities, actors responsible for various aspects of implementation, monitoring or accountability roles are often not clearly specified.

Nevertheless, effective policy formulation and implementation remains a pressing challenge in APC countries, as in many developing countries. On the policy front, as of 2023 various ACP countries have an R&I policy[15]. Although, a handful of ACP countries still do not have an explicit STI policy (UNESCO, 2021), the totality of ACP countries has included STI in one form or another as a key driver for development in their policy development plans and roadmaps. Several of these nations have explicit and dedicated R&I policies, which may also be referred to as STI policies. **Table 1** below shows the status of STI policy formulation and implementation.

15 This may be an R&I policy or the variations of Science and Technology (S&T), STI, Technology or Innovation policy.

Table 1 - Status of R&I (or STI) policies in Handbook countries

Country	Main R&I / STI ministries, agencies, actors	R&I / STI policy (most recent date)	Implementation status[16]	Selected reference(s), comments
Cameroon	Ministry of Scientific Research and Innovation (MINRESI)	Currently developing its first R&I strategy, with support from the PSF	Formulation process ongoing; implementation yet to commence	N/A
Ethiopia	Ministry of Science and Technology (MoST)	STI policy 2022[17]	Conceptual review, implementation	MoST (2012). UNCTAD (2020)
Gambia	Ministry of Higher Education, Research, Science and Technology (MoHERST)	National STI policy (2014 – 2024)	Under review by the partners: UNESCO	MoHERST Strategic Plan (2021 – 2025) National Research and Innovation Fund OACPS (2022)
Guinea	Ministry of Higher Education, Scientific Research, and Innovation (*Ministere de l'Enseignement Supérieur, de la Recherche Scientifique et de l'Innovation – MSRSI*)	R&I policy and strategy document being developed through the support of the OACPS R&I PSF	Strategy document	Research and Innovation: Report of Policy Recommendations in Guinea[18]
Kenya	Ministry of Education (MoE), Nat. Council on STI (NACOSTI)	STI policy 2008[19], 2020 (Draft)	Policy is still in draft stage[20]	MoE (2020), GoK (2013)
Lesotho	Ministry of Information, Communication, Science, Technology and Innovation (MICSTI)	Revised R&I policy, with support from the PSF awaiting cabinet approval	Revised, political issues stopped the process implementation	S&T Act of 2021, UNCTAD (2010), R&I Policy Recommendation Report in Lesotho, (OACPS PSF, 2022)[21], UNTBLDC (2022)
Mauritania	Ministry of Higher Education and Scientific Research (MESRS) and MTNIMA	STI policy[22]. Also, the first R&I strategy developed in 2022 with the support of the PSF	Implementation, some amendment of the regulatory part to implement the policy, awaiting approval	STIP; UNCATD 2010 STIP Review and OACPS PSF, Recherche et innovation Rapport de recommandations politiques Mauritanie, (2022)[23]

16 Based on desktop research and interview data
17 As of the time of writing this Handbook, this policy is only available in Amaharic. According to the management of the Ministry of Innovation and Technology, the English Language version is not ready as of November 2023
18 https://oacps-ri.eu/en/news/policy-support-facility-in-guinea-final-event-of-the-service-carried-out-to-develop-the-first-national-ri-policy/
19 STI Policy and Strategy of 2008 is available at http://www.ist-africa.org/home/files/kenya_sti-policy_mar08.pdf
20 Despite the presence of a formal and explicit STIP, Kenya has been implementation STI via dedicated institutions (including NACOSTI, KENIA and the NRF), instruments and programmes.
21 OACPS PSF, Research and Innovation Policy Recommendation Report in Lesotho, 2022, https://oacps-ri.eu/wp-content/uploads/Lesotho_PRR_OACPS_FInal_120422.pdf
22 UNESCO Science Report of 2021 - https://www.unesco.org/reports/science/2021/sites/default/files/medias/files/2022/02/Arab-States-Figure-17-6.pdf says that Mauritania does not have an explicit STIP
23 https://oacps-ri.eu/wp-content/uploads/Mauritanie_PRR_OACPS_Final_v2-2.pdf

Table 1 - Status of R&I (or STI) policies in Handbook countries				
Country	**Main R&I / STI ministries, agencies, actors**	**R&I / STI policy (most recent date)**	**Implementation status[16]**	**Selected reference(s), comments**
Mauritius	Mauritius Research and Innovation Council (MRIC)	No formal / explicit STI policy	Implementation using specific policy instruments	Digital Transformation Agenda exist[24]
Mozambique	Ministry of Science, Technology and Higher Education (MCTES)	First Science and Technology Policy, 2003 and STI Strategy, 2006 Policy and strategy on STI, 2023 draft (expected to be approved by end of 2023)	Implementation on-going but STI policy currently under review	Republic of Mozambique (2022)
Namibia	Ministry of Higher Education, Tech., and Innovation (MHETI); National Commission on Research, S&T (NCRST)	STI policy 2020-2023	Implementation	NCRST (2021), NSA (2019)
Seychelles	Division of STI (DSTI) under the Ministry of Investment, Entrepreneurship, and Industry (MIEI), National Institute for Science, Technology, and Innovation in Seychelles (NISTI)	STI policy and strategy 2016-2025	Under review by UNCTAD	No data
Tanzania	Ministry; Nat. Commission for S&T (COSTECH), National Planning Commission	1996 S&T policy is the most recent. A new draft STIP is being finalised	Implementation of 1996 S&T policy	New policy under development is at consultation stage
Timor-Leste	Ministry of Higher Education, Science and Culture; Instituto Nacional de Ciência e Tecnologia	No formal STI policy. Currently, STI policy is absorbed in the National Policy of Higher Education	Formulation phase of the policy, with the support of the PSF, stakeholder engagement completed. The development of a science map, i.e., a nationwide inventory to ascertain the state of play of scientific research in the country is underway, which will allow for the development of a realistic STI policy in line with the country's needs	An institutional plan exists but not a national STI policy; see also for example, OACPS PSF, Policy Recommendation Report for developing an STI policy framework and a National Digital Repository in Timor-Leste, 2022[25]

24 Agenda National de Transformation Numérique 2022-2025, https://mtnima.gov.mr/sites/default/files/Agenda%20Num%C3%A9rique%202022-25%20MTNIMA.pdf

25 https://oacps-ri.eu/wp-content/uploads/TIMOR-LESTE_PRR_OACPS_Final_270622.pdf

Table 1 - Status of R&I (or STI) policies in Handbook countries				
Country	**Main R&I / STI ministries, agencies, actors**	**R&I / STI policy (most recent date)**	**Implementation status[16]**	**Selected reference(s), comments**
Togo	Ministère de l'Enseignement Supérieur et de la Recherche (MESR)	STI policy was initiated in 2014[26]	No implementation yet[27]	See Cartographie-des-acteurs-des-resultats-et-des-besoins-en-RI-au-Togo-OACPS Varriwa IF project[28]
Zambia	Dept. of STI, Ministry of Technology and Science	STI policy 2022	Implementation and revision (the 2022 STIP is currently being revised)	GoZ (2022)

Source: Authors

As **Table 1** above shows, the countries involved in this MLE have formulated an R&I policy, except Mauritius and Cameroon, which is in the process of finalising its R&I strategy. This indicates progress in formulation. In addition, relevant institutions have been put in place in the various countries and regions outlined above. Nevertheless, scholarly publications, policy documents and reports, corroborated by empirical evidence gathered during the MLE, reveal weaknesses in implementation. Another area of weakness is in the approval stage of R&I policies in ACP countries. For example, several ACP countries submitted their R&I policies for approval at cabinet level, but the processes have encountered obstacles at the political level. This highlights the importance of involving parliamentarians in the policy process to help ensure approval of the final draft and improve the prospects for greater implementation success. Although these weaknesses become more apparent as implementation challenges, they also point to gaps in formulation. To this end, a more effective articulation of the processes involved in the formulation stage – for example, by improving stakeholder engagement – may have helped address some of the challenges before they emerge in the implementation stage. The next section unpacks some of the challenges and why they have persisted.

26 "*STI plan exists but it has not yet been implemented by the government and has not yet been funded*" (source: Togo interview data), still pending approval.
27 Also, the 2020 National Research and Innovation Policy has not yet been adopted by the Council of Ministers.
28 https://varriwa.com/wp-content/uploads/2022/12/Cartographie-des-acteurs-des-resultats-et-des-besoins-en-RI-au-Togo-.pdf

2.2 MAIN CHALLENGES AND WHY THEY HAVE PERSISTED

This section the Handbook presents some of the main challenges around R&I policy formulation and implementation, while also exploring why they exist and have persisted.

Formulation challenges and the reasons why they have persisted:

- Weak R&I policy mind-set among policy-makers and the political class, despite a strong appreciation of the role of R&I in socioeconomic development. Furthermore, existing theories and frameworks that underpin policy-making often do not reflect the ideologies and thinking of current political and economic actors.
    - o This is due to factors that include weaknesses in the capabilities and skills of researchers and policy-makers involved in policy-making processes.
- Gaps in the evidence base needed to inform and support policy-making often mean that there is a very weak understanding of the challenges being addressed by R&I policies.
    - o This is due to factors that include gaps in data collection, processing, storage, and management; capabilities and skills of researchers, poor linkages among the NSI actors, funding, and lock-in in the culture and practices around policy-making processes. For example, evidence from The Gambia reveals that "decisions on STI are based on assumptions, not scientific approach, data and evidence; hence the need for capacity building for decision-making and decision-makers" (source: interview).
- Low levels of inclusiveness and stakeholder participation.
    - o This is due to factors that include weak stakeholder engagement and a silo mentality that hinders effective collaboration and knowledge exchange, politics and power, political economy considerations, funding, and inadequate policy processes.

Implementation challenges and why they have persisted:

- [In many instances] there is lack of a costed implementation framework with defined performance indicators, reporting and accountability measures. Evidence from Seychelles reveals that, although there is a policy, there is "no detailed implementation plan" (source: interview data). In addition to the lack of an implementation framework and MEL, there is often no communication strategy for the implementation of the STI policy, as stated in an interview from **Guinea**. In the case of **Namibia**, "a MEL framework exists; however, this is currently being validated. In addition, there is need for indicators for operationalising the MEL framework, more stakeholder engagements with the key policy actors, and the need to address the lack of understanding of STI data, and a lack of capacity[29]. Furthermore, there is a need for digitisation and the automation of the STI management system. To address the gaps in indicators, the Ministry of Edu, S&T and NRCST will need to work with the National Statistics Agency (NSA)" (source: interview).

29 Currently, there are only about three people dealing with STI issues at the NCRST.

- This challenge persists essentially due to gaps in the formulation stage, at which point a costed implementation framework with appropriate indicators, instruments and other essential ingredients should be developed.

- Inadequate funding and resources for implementation.
  - This challenge persists due to factors that include low funding[30] for R&D/STI, weak political commitments to funding R&D/STI, weak stakeholder engagement, and gaps in the formulation stage. For example, **Togo** reports that "an STI plan exists but it has not yet been implemented by the government and has not yet been funded" (source: interview data). Efforts to secure funding and implementation actors must begin at the formulation stage, to improve implementation chances and outcomes.

- Low levels of inclusiveness and stakeholder participation.
  - Like formulation, this is due to factors that include gaps in stakeholder engagement, politics and power, political economy, funding, and weaknesses in the policy processes. For example, evidence from Ethiopia points to the fact that "there are conflicts of interest between the ministries and unnecessary competition which affects implementation" (source: interview, see **Chapter 9** for more on Politics).

It is evident from the above that some of the challenges feature in both formulation and implementation, although the nature might differ slightly. For example, while political commitment and funding are needed for formulation of R&I policies[31], regular reviews and updates of such policies may take place every five (5) years to ensure that R&I policies remain relevant. Similarly, funding remains critically important for the implementation phase.

2.3 POLICY TOOLS AND INSTRUMENTS: MAIN INTERVENTIONS, OPERATIONALISATION, AND IMPACTS

Some of the main challenges and insights on why these challenges have persisted over the years have been outlined above in **Section 2.2**. This section examines some of the interventions that have attempted to address the challenges and improve policy-making in ACP countries. A summary of typical policy instruments and tools that have been deployed to address the challenges are summarised in **Table 2** below.

30 A senior policy-maker from a participating country noted "The challenge is that in most ACP countries, especially in Africa where policies are designed with donor funding rather than the use of local resources in mind, this results in very ambitious programmes and priorities that are misaligned with reality".

31 Formulation may take place, for instance, at an interval of 10 years.

Table 2 - Typical policy instruments deployed to address gaps in policy formulation and implementation

	Selected innovation policy challenges	Policy instruments, tools and approaches being used to address the gaps	How the policy instruments, tools and approaches are operationalised, outcome
Policy Formulation	Poor understanding of the relevant theories that underpin policy-making.	Education, training, and capacity building.	One indicator that efforts in this regard have produced less than optimum outcomes is the very low number of researchers in STI[32] e.g., in Africa.
	Weak evidence base to inform and support policy-making.	Training on indicators and data collection; creation of new institutions, strengthening of existing institutions, changes in structure and governance, infrastructure development, etc.	In the case of Africa, for example, actors like AUDA-NEPAD have been strengthening the skills of researchers and policy-makers in indicators and data collection[33].
	Low levels of inclusiveness and stakeholder participation.	Consultation, stakeholder engagement (although often ad hoc and devoid of structure) and communication.	Increasingly more efforts to consult widely and include a broader range of actors. However, the lack of clear selection criteria, framework, and a defined approach result in the exclusion of some key actors, especially industry, youths, CSOs, women, grassroots, and frugal innovators[34].
Policy Implementation	Weak NSI[35].	Education, training and capacity building, awareness.	Further work on stakeholder engagement. Establishment of coordination and articulation mechanisms between NSI actors.
	Unavailability of implementation framework.	STI formulation, revision and updates, and reviews.	Greater attention to governance (see **Chapter 8**).
	Inadequate funding and resources for implementation.	Set up of funding instruments such as National R&I Fund (FONDRESI) in Cameroon or Lesotho Innovation Trust Fund[36] and National Research Fund in Mozambique (https://fni.gov.mz).	Securing and allocating more funds to research and STI.
	Low levels of inclusivity and stakeholder participation.	Improvements in stakeholder engagement.	Consultations and changes in approaches to R&I formulation, revision and updates, and reviews.

Source: Authors

32 A participating country policy-maker emphasised that "gaps in the relevant policy-making knowledge cannot be addressed by training more researchers in STI. That is why the gap still exists. STI policy-making is now a very specialised field of study and is very different from other scientific fields such as those in which researchers are trained. The recommendation is to consider the kinds of training provided by the Science Policy Research Unit (SPRU) at the University of Sussex, UNU-MERIT and similar institutions on STI policy-making".

33 Similarly, initiatives such as the SGCI have been involved in capacity strengthening for data management to inform STI policy-making. According a policy-maker from a participating country, "A lot more work is required here: first the art of collecting relevant data needs to be perfected and, secondly, the ACP countries cannot be left out in the use of emerging technologies like big data and AI, especially when these can be used to enhance both data driven decision making (DDDM) processes and data informed decision making (DIDM) processes. There is a need to integrate with existing STI data systems".

34 In addition, actors and stakeholders outside of government need to see value in STI policy decisions, but are seldom provided with opportunities for ownership and buy-in. One reason for this is because policy processes are mostly led by government agencies and are, therefore, viewed as tools of government propaganda by some non-government actors.

35 Guinea: "Weak organisation of the national R&I system; Weak resources (human, financial, and material); Limited openness of the system to the international community" (source: interview data).

36 Other examples include the National Research, Science and Technology Fund (Namibia) and National Research Fund (Kenya) (UNESCO, 2021).

As **Table 2** above shows, several interventions have been put in place to mitigate or addresses weaknesses in policy formulation and implementation. Nevertheless, many gaps remain because these interventions have been inadequate, hence the persistence of the challenges and the need for this Handbook. If addressed, effective policy-making in R&I will contribute to transformative change in various dimensions, as discussed in the next section.

2.4 OPPORTUNITIES FOR TRANSFORMATIVE CHANGE

Progress in R&I is central to addressing the multi-dimensional development challenges of poverty, unemployment, inequality, and ecological damage confronting Africa. To exploit R&I more effectively in tackling these challenges, appropriate policies, strategies, and regulations need to be formulated and implemented. The expectations from STI continue to rise across the ACP regions, with citizens demanding increasingly higher outcomes and impacts from STI. **Ethiopia** stressed that "STI should answer key pertinent questions in the economy, support job creation, wealth creation (enterprise), and contribute to GDP" (source: interview data).

In The **Gambia**, the aspiration is to "harness STI for socioeconomic growth and development", Mozambique aspires to be a knowledge-based and innovation-oriented country with high investments in R&I, to face social challenges and achieve economic growth (P&S of STI, 2023). Meanwhile **Timor Leste** "in partnership with international donors including the EU, OACPS, and UNESCO, and partner countries such as Singapore, Indonesia and Portuguese speaking countries, is currently developing an STI policy that is expected to help achieve development goals". These expectations are against a backdrop of NSI ecosystems that require significant strengthening, improvements in governance, weak linkages among actors and stakeholders, fragmentation, and coordination challenges. For example, in The **Gambia**, senior government officials report that the "STI landscape is rudimentary and young, maturing quite slowly, and that the focus is not really on STI" (source: interview data).

Opportunities in R&I, enabled by appropriate policies, that can support ACP countries' transformation targets and foster transformative change with long-term development impact include:

- Enhancing economic growth, industrialisation, and competitiveness.
- Increased productivity, employment generation, social progress, and improved wellbeing.
- Reduction in poverty, inequality and exclusion, and environmental degradation.
- Strengthening ACP countries' ability to harness their (youth) demographic dividend, natural resource endowments, and gains in the digital space.
- Help realise long-term development aspirations such as Agenda 2063 and the SDGs.

2.5 CASE STUDIES ON POLICY FORMULATION AND IMPLEMENTATION

2.5.1 Case study on formulation

Cameroon and Mauritius present examples of where R&I (or more specifically STI) policies are currently not in place and need to be formulated to help guide R&I activities and ecosystem more effectively. Despite the absence of explicit R&I policies, both countries are carrying out R&I activities using specific and targeted instruments. In **Cameroon**, a National STI strategy is being developed, with the support of the OACPS through its PSF service arm, and an action plan is to be validated. In addition, an innovation research-oriented law is currently being validated. Combined, these initiatives are expected to help address the challenge of very low public research funding – currently R&I funding is mainly based on international cooperation. Similarly, in **Mauritius** dedicated funding mechanisms, special calls and fast-track innovation grants, schemes and mechanism have been put in place to foster R&I across the country[37].

2.5.2 Case study on implementation

Zambia: "Our STI policy is new - 2020. However, due to change in the Ministry's name and the new 8th NDP and Vision 2030 and a change of government, emphasis is now placed on STI to be the anchor of economic growth; we have been guided to review the STI policy. Other reasons for the review include the need to align the STI policy to space policy, which is being developed, finalising the review of the S&T Act (previous version was 1996)" (source: interview). The implementation is being operationalised using various instruments, including the Strategic Research Fund, managed by the National Science and Technology Council (NCST), the Tech Business Fund, and STI Youth Fund. These funds are not very big, yet. However, the government is looking to enshrine specific instruments in the policy to help grow the funds. To this end, Zambia presents a case where an STI policy is in place, recently revised and renewed, and implementation is ongoing via various mechanisms.

The key insights from these case studies include: **a)** ACP countries currently have R&I policies or are in the process of formulating such policies, **b)** countries with extant policies are also reviewing and updating their policies or are in the process of doing so, and **c)** in both cases – that is, where policies are in place or not yet in place – some form of implementation is taking place through a dedicated policy mix, institutions and initiatives – although these may not go far enough, thus requiring improvements and renewed focus.

37 https://www.mric.mu/innovation-and-commercialisation-schemes

2.6 RECOMMENDATIONS

Policy Formulation

- Invest in human capital, education, and skills[38], and institution strengthening for R&I policy. Investments in human capital through education and skills training, alongside institution strengthening, will help improve understanding of the relevant theories that underpin policy formulation and the evidence base that informs policy-making.
- Employ experimentation with demonstrators to help uncover and develop alternative pathways and break lock-in and path dependencies that stifle innovation in policy-making in the sense that policy-making processes themselves need to innovate and be transformed.
- Include a broad stakeholder base right from the start of the policy formulation processes – conceptualisation, agenda setting, consultation and drafting – to the end.
- Establish multi-sectoral and inter-disciplinary teams in the formulation, revision and updating process.
- Carry out advocacy to ministries in charge of planning, as they are also responsible for the distribution of resources in some countries.

Policy Implementation

- Ensure that policy implementation plans or frameworks are developed alongside the formulated policy or strategy. In addition, the implementation plans or frameworks must be fully costed, bearing in mind the availability of resources. Furthermore, there must be clear roles – with prior agreements – for the different actors and stakeholders involved, alongside accountability mechanisms[39].
- Ensure that implementation actors and stakeholders for R&I policies are included in the formulation stage, with clear indications of roles and responsibilities for key institutions[40].
- Increase political commitments and funding for R&D and R&I with respect to implementation but also, formulation[41]. Furthermore, establish a funding mobilisation strategy for R&I policy implementation.
- Engage with high-level officials responsible for decision-making on R&I policy, such as the Parliamentary Committee on S&T, and ensure their inclusion in the relevant policy processes and stages. This is because this group of stakeholders determines the funding, resource allocations, governance, structural configurations, and political economy considerations that help shape and influence the implementation of and outcome from STI.
- Integrate a MEL plan into the R&I policy implementation framework, with clearly defined indicators and metrics.

39 See **Chapter 8** on Governance for more on this.
40 See again **Chapter 8** on Governance of R&I policies for more on this.
41 See **Chapter 3** for more on Funding.

3 Funding for R&I Policy-making

3.1 OVERVIEW

Given the background on R&I policy formulation and implementation, this chapter presents an overview on funding R&I, main challenges, tools, instruments, interventions, opportunities for transformation, cases studies and recommendations. The chapter examines these issues, and unpacks and delves into the effectiveness (or lack thereof) of existing initiatives and instruments. Funding R&I across ACP countries needs to move from rhetoric to practice (Mugabe, 2011). Effective financing of innovation remains a major challenge. In Africa for example, GERD has persistently remained below the 1% recommended in the Lagos Plan of 1980 (OAU, 1982) and re-emphasised in STISA-2024. Despite criticism of this focus on increasing R&D that it a) is based on a linear model; b) requires other variables to stimulate socioeconomic growth and development; and, c) is modelled on the assumption that increasing investments in scientific research takes care of all, with less attention to the role played by innovation; R&D remains an important source of innovation and economic growth, thereby necessitating the increase in investments.

The main emphasis is on funding for R&I policy formulation and the relevant capabilities and associated costs. Thereafter, the funding for implementation of the key strategies and associated instruments designs are discussed. The chapter takes into consideration the previous chapter on Formulation and Implementation, and builds on how funding enables the formulation and implementation of R&I policies. The Africa Caribbean and Pacific region comprises 15% of the world's population, yet Africa contributed only 0.38%, Caribbean 0.35% and Pacific 1.38% of global investments in R&D in 2019 (UNESCO, 2020). This reflects the evidence that four out of five countries globally still spend less than 1% of GDP on research and development (UNESCO, 2021). This observation has been well discussed during the MLE exercise, providing insights on the state of funding in each of the participating countries. The MLE countries identified funding and investments for STI and R&I policy implementation as an inherent weakness in their countries.

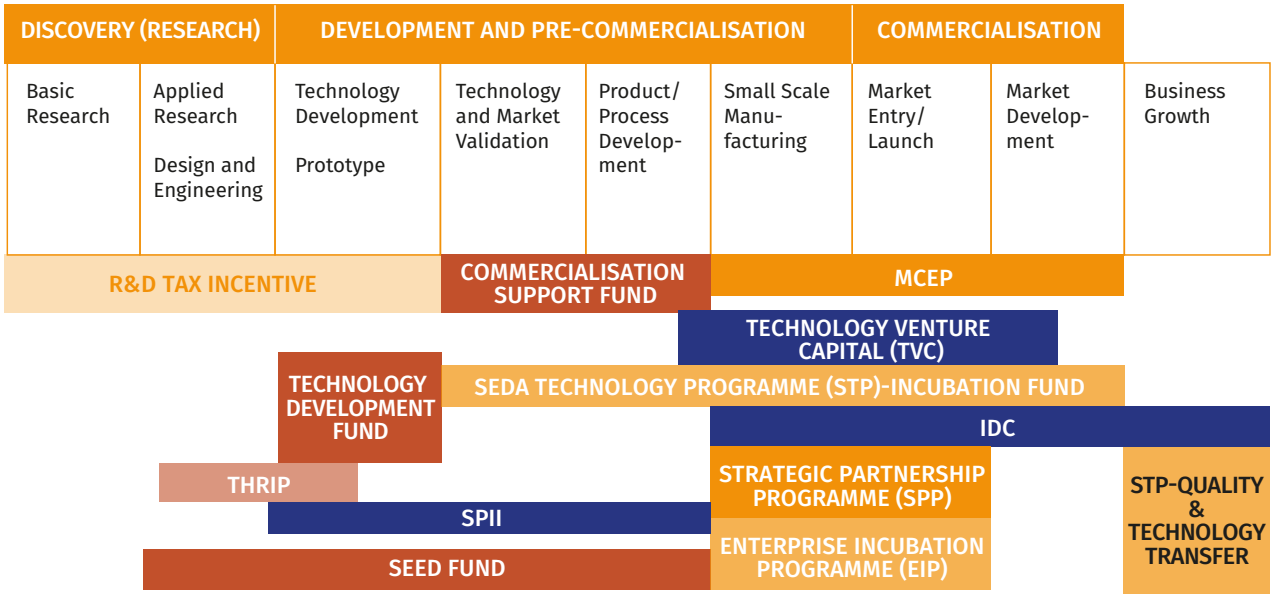
Funding for R&I can include investments in research infrastructure as well as capacity building for research and innovation at national and regiona l levels. However, the primary focus here is on funding for R&I policy formulation. In the context of this Handbook, it is valuable to also consider case studies that examine the return on investment (RoI) in R&I policy, along with proactive R&D initiatives that have yielded tangible impacts. A compelling example is the examination of government expenditure on R&D, which can be elucidated through the Finnish mobile communications industry at the turn of the century. The success of this industry can be attributed to both the vision and foresight of the Finnish R&D community, which identified cell phones as a major growth opportunity. Furthermore, the sharing of risk among various stakeholder, including government, universities, and industry, underlines the efficiency of a national system of innovation and a sustained commitment to R&D by industry leaders (Walwyn, 2007).

In this example, it is evident that government investment in R&D triggers complementary company level R&D that leads to multiplier effects on RoI. In this regard, it is crucial to underscore that these investments in R&I serve as an important contributor to innovative solutions that generate economic

value. Therefore, this emphasis on R&I does not diminish the significance of innovation. In assessing the current R&I investment gaps in the ACP countries, such case studies provide important learning opportunities and justifications for renewed emphasis on investments in STI and funding for R&I policies. However, there is a significant difference between the Finish model and the ACP countries' situation, where challenges of research infrastructure and capacity for R&D are still very much prominent.

To comprehend funding for R&I policies and activities, it is essential to also understand the diverse funding instruments currently deployed in most ACP countries. As depicted in **Figure 3**, the South African R&I funding instruments serve as an example, highlighting the diversity of the funding instruments that may be used to target specific aspects of the innovation value chain. This diversity demonstrates the intention to cover the full spectrum of R&I ecosystem needs.

Figure 3 **Innovation and Technology Funding instruments**



Source: DTI, South Africa

The MLE exercise highlighted funding as key to unlocking R&I policy outcomes among the ACP countries. The challenge in this area has persisted (see **Section 3.2** below for more) because, for the most part, government policy pronouncements in ACP countries have been misaligned with the established policy instruments and the targets set for funding R&D and R&I in several countries. Expenditure on R&D remains key to any country aiming to make a positive economic impact. To reiterate, there is a strong correlation between R&D expenditure and the economic prosperity of a country (OECD, 2004). Funding of R&I policy initiatives, particularly implementation, typically undergoes key stages that involve national fiscal bodies and budget allocations in line with national priorities.

3.2 MAIN CHALLENGES AND WHY THEY HAVE PERSISTED

Foremost among the most significant challenges is the persistent lack of sustained and adequate financial resources from national governments, despite the numerous pronouncements by ACP countries. This issue persists due to frequent conflicting priorities at national level, all vying for the same resources. Funding and investments in R&I in most participant countries lack a robust guiding framework that allows tracking of the R&I returns through relevant economic indicators, resulting in tangible benefits.

Empirical evidence gathered from the MLE workshop, expert interviews and literature reveal that many of the participating countries' national budget planning commission's process does not normally involve R&I policy formulation and implementation planning. This deficiency poses a considerable challenge for legislators and policy-makers. Effectively utilising well-documented indicators in R&I is crucial, as it provides essential data to inform planning authorities regarding the required investments in R&I policy implementation. This includes not only understanding the intricacies of the instruments involved but also anticipating both short- and long-term economic outcomes. Table 3 highlights some of the challenges in funding R&I policy with emphasis on formulation.

Table 3 - Country challenges and opportunities

Country	Challenges associated with R&I funding
Gambia	Securing adequate funding for R&I is seen as the biggest challenge. While the government is actively endeavouring to create a national innovation fund, the allocated amount stands at a modest 3 million dalasi, equivalent to 50,000 dollars in local currency. Bureaucratic obstacles hinder R&I funding and implementation processes.
Guinea	National fiscal bodies' budgetary constraints also restrict R&I funding in Guinea
Kenya	A lack of funding was identified as a threat to the Kenyan R&I ecosystem and policy formulation. Current actual expenditure on R&D is about 0.7%, which is still inadequate. However, the country has committed to investing 2% of GDP on STI.
Lesotho	There is generally low financing of micro, small and medium-sized enterprises (MSME's). There is the need for more tax incentives to stimulate tech incubators. Lesotho has also benefitted from the PSF policy support in the funding of R&I policy formulation.
Mauritania	According to the government, funding is inadequate, with less than 0.06% of GDP invested in R&I. Low funding is seen as a weakness in the country's analysis.
Mozambique	The Government of Mozambique has established a National Research Fund in a bid to access funding for R&I promotion. However, the disbursements to the Fund are yet to be realised. Current efforts are on promoting the Fund nationally, regionally, and internationally.

Table 3 - Country challenges and opportunities	
Country	**Challenges associated with R&I funding**
Namibia	Limited investment in R&I is seen as a challenge. Funding for R&I, in general, is provided through international development partnerships. The commitment of funds for the national programme on research and STI are made over a five-year period and administered on an annual basis throughout the planned period. The NCRST has developed a provision to advise the government on five-year budget allocations to be issued on an annual basis.
Seychelles	A Research and Innovation Fund is still being set up, with a strategy to get private sector funding to support government efforts. Seychelles is targeting a GERD of 2% of GDP by 2025 (National Institute of Science Technology and Innovation; 2016). Seychelles has access to funding mainly through international partnerships. Funding for the incubator is through the African Development Bank, which will then hand it over to the government. Grants for innovation and research are also provided by the government. Seed capital: grant for SMEs, Special Seychelles Trust Fund. Budgetary provisions for government departments, international philanthropic funding, international and regional organisations e.g., EU, WHO.
Tanzania	National funding for R&I is limited, with most funding coming from international donors. The Ministry provides other resources through the national budget provisions.
Timor-Leste	R&I is not well funded in East Timor. Although the R&I policy is not yet in place, the government advocates for 0.25% of GDP on R&I investments ahead of the commissioning of the R&I policy. The government has extended funding through research at universities. The Petroleum Fund provides some financial resources for STI. Under the provisions of the PSF support, there are opportunities to provide guidance on the proportion of funding accessed from the Petroleum Fund to STI.

Source: Authors

Persistent challenges in securing funding for R&I policy formulation and implementation have been a longstanding issue in ACP countries. While there have been ongoing efforts by both national and international organisations to address these challenges, private sector participation remains limited. Current interventions, which encompass capacity building for STI policy, as well as funding initiatives and engagements with senior policy-makers, provide valuable opportunities for governments. These opportunities extend beyond merely formulating quality R&I policies; they also involve allocating sufficient budgets to support R&I activities at both national and regional levels.

3.3 POLICY TOOLS AND INSTRUMENTS: MAIN INTERVENTIONS, OPERATIONALISATION AND IMPACTS

Data from the MLE exercise, supported by evidence from literature, helped to identify gaps in the funding processes and disjointedness from mainstream economic indicators in ACP countries. The evidence suggests that, although many international agencies currently provide support to develop R&I policies in ACP countries, including funding support, commitment to invest in the R&I policy and implementation instruments appears to be relatively slow. A decade ago, many ACP countries already had R&I policies and some form of initial instrument to execute these. However, realising the full impact of these national R&I policies has remained a challenge, partly due to gaps in the design, choice and operationalisation of policy instruments.

Different interventions for funding R&I policies have been proposed and utilised in ACP countries, while a few have demonstrated significant change under current circumstances. Financial incentives in R&I play an important role in promoting innovation and in addressing the pressing challenges faced by ACP countries, such as high youth unemployment, the imperative for rapid industrialisation, and the need to combat climate change. In a landscape where traditional sources of funding for research and innovation are dwindling, there is a growing demand for innovative models to support R&I .

The utilisation of tax incentives has been identified as a promising tool for promoting R&I in ACP countries, alongside the establishment of national innovation funds. These measures collectively aim to stimulate research, innovation, and development, offering a strategic response to the evolving funding needs in the dynamic context of ACP nations.

The creation of the National Innovation Fund in The Gambia and new STI partnerships in Rwanda and Tunisia that are underway, are positive contributions in ensuring long-term funding for R&I and sustainability. Limited funding opportunities lead to weak implementation of R&I policy. According to the Ethiopian government, only 70% of targeted investment is achieved. This investment is only 0.3% of the national GDP. The rest of the contributions are from other sources, including investments from different financial institutions (source: interviews).

The Cameroonian R&I ecosystem is characterised by funding from international development cooperation initiatives. A national fund for R&I would play a pivotal role as a strategic instrument and as a cornerstone for fostering advancements in R&I. Anticipated to be developed in the future, the National Fund for Research and Innovation (FONRESI) is set to contribute to progress in research and innovation in Cameroon.

In Kenya, funding is distributed through line ministries. There are multilateral linkages for research funding through the Medical Research Institutes, which access 2/3 of funding from donors such as CDC-USA, Wellcome Trust, funding from the Africa Academy of Science, and through the Bill and

42 https://sgciafrica.org/wp-content/uploads/2022/03/New-Approaches-for-Funding-Research-and-Innovation-in-Africa.pdf

Melinda Gates Foundation. Kenya also has a Youth Enterprise Development Fund which benefits youth owned entities through the government procurement framework.

In Mozambique, the Private Financing Advisory Network's (PFAN) Climate Technology Initiative (CTI) is financed by both the government, through an internal component, and through an external component (donations and credit) from agencies and foreign governments. Preliminary results of the 2020 R&D survey show that GERD as a percentage of GDP has slightly reduced from 0.35% to 0.30% from 2018 to 2020. This is still below the 1% target defined by SADC and NEPAD. On the other hand, preliminary R&D results show that in 2020, the primary source of funding for GERD was from the external component of the government budget (41.42%), followed by other sources (23.93%), and internal contributions (20.84%) as well as own funds (13.71%). This scenario demonstrates that R&D carried out in the country depends on external funds.

In Zambia, there are various funding instruments for R&I, including the Strategic Research Fund, managed by the NCST, the Technology and Business Fund and the STI Youth Fund. These are relatively small funds; however, there are efforts to grow them. The provision for budget allocation to the National Research Fund under the statutes has not yet materialised as it is yet to be conceptualised. The targeted 1% expenditure on R&D from GDP has not yet been met. Zambia is therefore still in the early phase of realising its potential in R&I funding.

Regional blocs are taking proactive measures by formulating specific strategies and policies to bolster R&I. An illustrative example is the Southern African Development Community (SADC), which is in the process of establishing key instruments, including a regional development fund, with support from the African Development Bank (AfDB) (source: www.sadc.org). These initiatives collectively aim to enhance the landscape of R&I in the region.

Several international agencies have also supported R&I activities in Africa. For example, Kenya is currently attracting substantial R&I funding into its ecosystem mainly through the different instruments provided by private funding entities like the Bill and Melinda Gates Foundation, and the Wellcome Trust. This funding targets healthcare aspects such as the Centre for Disease Control (CDC) research funding (African Academy of Sciences, 2022). These interventions create opportunities for the country to augment its investments in R&I policy implementation funding.

The Science for Africa Foundation (SFA) launched the second phase of a multimillion-dollar programme developing world-class research and producing African scientific leaders on the continent, while simultaneously strengthening African institutions (SFA Foundation, 2023). However, insights gathered from the MLE exercise show that, despite political will and support for R&I, numerous conflicting national challenges, such as poverty, continue to place funding for R&I policy implementation among lower priorities. This is despite efforts by many ACP countries to factor R&I policy implementation in their planning approach at their national planning offices.

There is a need to develop and implement a diverse portfolio of funding instruments to support R&I funding requirements. Interventions, for example through the Science Granting Councils Initiative (SGCI), provide grant funding and capacity building

to support R&I. The SGCI is a multilateral initiative established in 2015 that is strengthening the institutional capacities of 16 public science-funding agencies in sub-Saharan Africa to support research and evidence-based policies that will contribute to economic and social development (SGCI, 2023). The Science Granting Councils Initiative supports the establishment and capacitation of African STI funding bodies to execute their functions in providing grant and alternative funding mechanisms for African research and innovation to flourish.

The highlighted interventions demonstrate that governments in ACP countries are making efforts to increase funding for R&I. There is evidence that government grants are key to stimulating R&I outputs to create opportunities in the market. These efforts by the governments should be augmented, significantly by private entities. The downstream funding includes investments and private equity as well as venture capital towards new ideas in the market. It remains important that governments commit initial investments in funding R&I formulation and implementation.

National innovation funds emerge as pivotal mechanisms capable of pooling resources and directing investments toward R&D, entrepreneurship, and the commercialisation of innovative ideas and products. This approach cultivates an enabling environment, empowering local entrepreneurs, start-ups, and micro, small, and medium-sized businesses to flourish, consequently fostering job creation and economic diversification. The establishment of national innovation funds not only acts as a catalyst for attracting Foreign Direct Investment (FDI) but also creates a favourable ecosystem that entices global investors, researchers, and innovators.

3.4 OPPORTUNITIES FOR TRANSFORMATIVE CHANGE

The transformative opportunities to enhance R&I policy formulation funding in ACP countries will to a large extent require mind-set change, especially among policy-makers, regarding their perception of the role of R&I policy funding in economic growth. There is a need for R&I funding in Africa to move from rhetoric to practice (Mugabe, 2011), however the situation remains to this day marked by low levels of political commitment to invest in R&I. Many policy-makers still perceive R&I funding as irrelevant to supporting livelihoods, opting instead for short-term low impact policies like poverty alleviation. However, such policies may inadvertently foster a dependency syndrome among the masses.

Understanding the long-term SDG linkages to R&I funding is essential to long-term sustainability in most ACP countries, especially towards alignment on achieving these SDG's. It is common knowledge that many researchers in low- and middle-income countries (LMICs) only access R&I funding through joining international research collaborations. This presents a sustainability challenge as it hinders the ability to leverage domestic resources and existing structures.

When it comes to funding, there is a need to consider several factors. Funding must be premised on R&I priority requirements at national or even organisational level.

Furthermore, the ability to raise and administer funds requires appropriate capabilities and skills, for example in scoping funding needs involving economists and planners. It is essential to situate the funding for R&I within the perspective of broader national challenges.

As observed and highlighted during the MLE exercise involving 15 ACP countries, there are different approaches to securing funding for R&I policy and developing associated funding models. For instance, some countries, like South Africa, plan on a 10-year basis, followed by periodic reviews and adjustment on the funding models and prevailing funding instruments. The table below helps illustrate a practical approach to addressing funding-related matters in formulating and implementing R&I policies. Based on feedback, Table 4 presents requirements for the R&I funding process from different stakeholders.

Table 4 - Practical steps to addressing R&I Policy formulation and implementation funding gaps

Funding	Required capabilities and participation	Sources of funding	Good practices	Frequency of funding	Timelines
What are the R&I policy formulation and implementation funding requirements?	Economists, planners, innovation scholars, scientific officials, policy-makers, industry practitioners	First, government revenue (GDP), development cooperation financing, investments from funding organisations e.g., development financing institutions Secondly, bilateral and multilateral funding sources e.g., EU partnership, regional and national support initiatives Third party private sector	Identify the challenges that require R&I policy intervention, conceptualise the solution for the challenge with relevant stakeholders. Secure funding to support R&I policy formulation through relevant expertise. Engaging all stakeholders involved to co-create solutions for the best funding models. Conduct frequent funding strategic reviews	Policy-makers seek consistent funding from government. This is essential to create traction with industries to provide funding for industry-specific interventions. i.e. 2 – 3 years	5 year implementation with review

Source: Authors

3.5 CASE STUDIES ON FUNDING

Despite relatively low funding for R&I policy implementation in most ACP counties, with a limited number of funding instruments available at the national level and funded by the national fiscal bodies, there is a growing trend for international support towards R&I policy formulation and implementation through a guided approach. International development agencies have been instrumental in facilitating capacity development for funding R&I. However, more sustainable means through national budgeting processes need to be established and prioritised in ACP countries.

Covid-19 Pandemic and changes in R&I funding

The Covid-19 pandemic led to the adoption of rapid response instruments to support R&I policy implementation in the health sector. Many countries adopted a data-driven approach to policy formulation in the context of Covid-19 economic management, to streamline recovery efforts and enhance results. Many ACP countries embraced unique approaches to funding innovative ways for survival, e.g., a lack of international solutions led to local production of much-needed equipment (e.g., ventilators and masks) which had to be manufactured locally through local firms and research organisations. Funding was provided not only through state funds, but also included contributions from private companies. Countries like Cameroon established unique instruments for funding health research and special provisions at the onset of the Covid-19 pandemic. For instance, the Government of Cameroon invested funding in research towards innovative solutions (Esso et al; 2020). This was part of the health research funding provisions to support the ecosystem to utilise innovative approaches to funding R&I. New developments included crowdfunding – soliciting funds online for a good cause, involving many people paying relatively small amounts. Crowdfunding has been associated with challenge-driven approaches to resolving pressing issues, especially through a co-creation approach between the research community, users, and innovators in many countries. This case study demonstrates that to help address the challenges in funding R&I policy-making, especially policy formulation and implementation, efforts must be made to explore innovative avenues and approaches such as crowdfunding platforms. These approaches have proved successful in the digital technology ecosystems where, for example, crowdfunding platforms have been used to fund digital/tech/innovation hubs, incubators, and accelerator programmes.

3.6 RECOMMENDATIONS

Most of the countries advocate for increased R&I policy funding so that they can achieve their long-term economic prospects. However, without a defined set of targeted R&I initiatives and funded instruments, achieving impactful R&I policies that will deliver the national and international sustainable goals will remain a pipe dream for many ACP countries. Therefore, to address the R&I policy funding challenge, ACP countries should consider the following:

- Conduct a systematic assessment of R&I policy needs to ensure clarity on the levels of funding required for the various stages in the policy cycle - from conceptualisation and formulation, to implementation, evaluation, and governance.
- Identify and engage with all potential actors and funders from both the public and private sectors during the R&I policy formulation stage, as this is crucial to ensuring that dedicated funds and resources are secured ahead of the policy implementation stage.
- Prioritise smart spending to maximise the impact of investment. This includes a focus on allocating resources efficiently to areas that will yield the greatest returns and aligning spending with the overarching goals of R&I policy.
- Involve national planning commissions and the national statistics offices in R&I funding stakeholder engagement. Involvement of other key actors in the policy processes helps to ensure that R&I policy-funding frameworks and plans are co-created and adopted more widely, thereby fostering collaboration and sustainability of the funding strategy.
- Establish national innovation funds and investment instruments in ACP countries where they do not currently exist, while ensuring the involvement of private sector actors. In operationalising the fund, **a)** develop incentives for private sector actors to co-invest in the fund, thereby supporting R&I policies and policy-making. These incentives may include tax incentives, recognition programmes or collaboration opportunities that encourage companies to contribute to national R&I objectives; **b)** ensure transparency in the allocation and disbursement of the R&I funds by putting in place robust governance and M&E frameworks that help to track and govern funding allocation, disbursement, and management, while also ensuring trust in the ecosystem.
- Design and implement robust funding instruments, including tax and regulatory instruments, and institute relevant incentives.
- Strengthen capacity for the generation of funding to support R&I broadly alongside R&I policy.

4 Monitoring and Evaluation of R&I Policies

Evidence from the fifteen countries involved in the first MLE activity, coupled with an broad literature review, revealed that many ACP countries face challenges in the development and implementation of monitoring, evaluation and learning (MEL) frameworks within their R&I systems. Hence, the significance of placing a strong emphasis on this topic in the Handbook. Therefore, this chapter presents notable challenges in MEL, tools and instruments as well as interventions. It further highlights opportunities for transformation as well as notable case studies and recommendations. The discussions and findings in this chapter draw on experiences of MEL practitioners in the ACP countries in designing, establishing and implementing MEL frameworks.

4.1 OVERVIEW

In addition to exploring principles, challenges, and good practices on MEL, this chapter highlights some examples of MEL implementation in the ACP countries and delves into related aspects such as indicators and metrics. The data and literature used underscores MEL as one of the critical issues that hampers the successful implementation of R&I policies and strategies in ACP countries. In most instances, evidence gathered through presentations and interviews by national representatives often indicated that MEL for R&I policy formulation and implementation was perceived as “weak” or “poor” due to several underlying factors. This exercise followed a methodology that helped to gather evidence from participants on best practices in MEL in their respective countries or jurisdictions.

MEL refers to a continuous function to assess the level of progress that is made in achieving expected results for a specific project. It plays a crucial role in informing policy evaluation within the policy cycle, which includes: 1. Agenda Setting, 2. Policy Analysis, 3. Policy Formulation, 4. Policy Adoption, 5. Policy Implementation, and finally, 6. Policy Evaluation. MEL refers to adopting quantifiable measures of different R&I indicators, for example, GERD as a percentage (%) of GDP over a period to inform learning and improvements. Monitoring provides information on where a policy, programme, or project is at any given time compared to some baseline or objective and is largely descriptive. It indicates where we are. Evaluation provides evidence about achievements of outcomes - a causal account. The underlying factors to MEL are to collect key metrics that can be used to provide quantifiable evidence, proof for accountability, inform coordination, facilitate monitoring of the policy implementation status, and evaluate the outcomes as well as allow comparative analysis with other settings and support learning. As interactive learning is a core and fundamental concept in innovation studies, the focus on this Chapter is on MEL, rather than M&E, which does not adequately emphasise learning.

A MEL framework consists of a logical framework (log frame, see **Figure 1**) constituted by inputs, outputs, outcomes, and impacts. MEL is typically supported by a well-designed set of indicators. Performance

indicators should encompass both baseline and target measures for expected results. While outcomes represent immediate changes resulting from the policy, impact signifies long-term results and may be appreciated through changes in socio-economic status. Traditionally, MEL is closely tied to the logical framework, capturing goals and outcomes through indicators. Developing and implementing a MEL framework must involve all underlying factors, e.g. competent human capacity, sound plans and appropriate technology among others... and be closely aligned to the objectives of the intended policies on R&I. It is evident from the Mutual Learning Exercise that the adoption of a standardised MEL framework for monitoring, encompassing for example, various indicators of socio–economic activities, has remained a pressing challenge across ACP countries.

The research underpinning the development of this Handbook revealed that majority of the ACP countries involved in this project lack a dedicated MEL framework. In some instances where provisions do exist, MEL exercises are infrequently conducted, typically after about three-year intervals. In some cases, there are ongoing efforts to digitise the MEL process and develop fully integrated systems. Recognising this, there is a considerable need to develop and institutionalise more robust and inclusive indicators to enhance the effectiveness of MEL initiatives. Participants involved in the Mutual Learning Exercise also emphasised the importance of involving several stakeholders in the MEL, for example a Statistician-General or statistics departments, stressing that these actors should become more active in the collection of data to support MEL.

Below are eight important components of a MEL plan:

1) Theory of change (ToC) and logical framework
2) Key performance indicators
3) Methods to collect evidence
4) Roles and responsibilities
5) Scheduling and timing
6) Using evidence for policy iteration
7) Allocating resources
8) Stakeholder involvement

The MEL key performance indicators provide information on the steps required to attain the set goals and objectives as well as to inform decision making and further improvements. The methods to collect evidence include interviews, group discussions, observation and surveys. Roles and responsibilities speak to who should be involved in the MEL. This will be determined by the project type but essentially involves various stakeholders, led by project managers. The scheduling and timing of the MEL involves the planning activities to develop practical timelines using tools such as Gantt charts. Resource allocation ensures that all components of the MEL are catered for financially, if there is no budget it will not happen. Key and central to the MEL is stakeholder engagement at all stages. Finally, the using evidence for policy iteration emphasises evidence-based learning.

Many MEL framework development initiatives are supported by regional and international agencies, building on national efforts. For example, in Africa, countries such as Lesotho and The Gambia, have received support, for instance, through AUDA-NEPAD, to facilitate the development of a MEL framework with indicators captured through national structures.

4.2 MAIN CHALLENGES AND WHY THEY HAVE PERSISTED

A key challenge associated with MEL stems from a primary observation that, for ACP countries with a developed framework, there is often a lack of implementation and or/poor administration of the MEL exercise. The main challenges are linked to the non-availability of MEL indicators for R&I policies, especially towards the attainment of, or alignment with, the SDG's. The lack of an appropriate MEL framework emerged as a critical issue that could jeopardise the achievements of any R&I policy implementation efforts. The underlying process to develop and implement an R&I policy relies on a MEL framework to guide the process and to check if indeed there are successes. Based on information shared during the Mutual Learning Exercise, specific information about countries is highlighted below.

Cameroon – The General Inspectorate is responsible for MEL, which includes measuring programme results, and assessing the field approach at the highest levels with MINRESI. This includes the collection of data and information, quality of work oversight, and evaluation of impact. Benchmarks for international standards are established with more than 60 regional and international organisations. A significant challenge lies in aligning key economic indicators with R&I indicators and integrating them with the Institute of Statistics, which deals with the economic indicators. The intention is to generate periodic reports with scientific approach-based indicators on a quarterly and annual basis.

Ethiopia – The weakest part of the STI policy is the lack of regular MEL. The established MEL committee is not yet functional and does not use indicators. This implies that there are no proper records as to how the MEL implementation is used to advance the R&I policy objectives. This hampers the implementation and achievement of set goals under the national economic strategies.

Gambia – There is no specific MEL framework in place for The Gambia, leading to the absence of periodic surveys. However, a report on R&I indicators is provided every three years to inform policy and aid decisions. This report, though, relies on several assumptions and lacks scientific backing, facts and evidence. This, therefore, implies limitations in the national approach to fully optimising the opportunity for a robust MEL framework and implementation plans.

Guinea – The MEL framework has not yet been fully developed. The establishment of structures, a monitoring committee and an increase in human capital are still underway. These are only the early stages in the MEL process and will require a stronger intervention by all players in the NSI.

Lesotho – Although the government of Lesotho has advanced its R&I policy framework, there are currently no internal tools established for MEL.

Mauritania – Despite the development of MEL indicators, their implementation is yet to be realised. The government mainly relies on perception surveys, utilising online social media analytics such as Facebook statistics to collect feedback from the public. A lack of efficient M&E is identified as a threat to the achievement of the aims of R&I policy. It has also been highlighted that due to rapid changes

in governance structures, implementation of R&I policy MEL activities as per the set targets constantly changes with new administrations. This impedes progress as the process is often truncated, incomplete, and unable provide the needed data.

Based on the information collected, MEL challenges stem from weak capacities in either developing the relevant frameworks, creating nationally relevant indicators aligned with economic indicators, and the lack of complete implementation of the MEL framework. Even in cases where indicators exist, the data collection processes are not well structured, as in the case of the collection of economic indicators under the national statistical surveys. Assessment of MEL for R&I in selected ACP countries reveals that many did not develop R&I policies in the earlier years of post-independence, hence the modern day lack of proper MEL and indicators. In the earlier post-independence years, there were no independent R&I policies as these were part of broader policies under the remit of education or trade ministries. Observations show that the current developments regarding MEL frameworks are informed by the availability of support in building national capacities in this regard.

4.3 POLICY TOOLS AND INSTRUMENTS: MAIN INTERVENTIONS, OPERATIONALISATION AND IMPACTS

Stakeholder engagement plays a pivotal role in the development of a robust MEL framework along with its implementation plans. This ensures the adoption of indicators that are comprehensive and encompass all sectors of the R&I ecosystem. Efforts must be made to ensure the MEL framework is relevant to both local and international stakeholders. This involves alignment with global initiatives such the SDGs to monitor progress towards achieving them as well as to inform key sectors of the economy, like the agricultural sector. These interventions, highlighted during the Mutual Learning Exercise and well-documented in R&I literature across ACP countries, underscore the significance of inclusive stakeholder involvement in the MEL process.

A key intervention highlighted and documented in the literature is from Kenya. The R&I policy incorporates measurable deliverables which will provide an opportunity to gauge progress over time. The MEL process is relatively advanced in the sense that there are already indicators established for it in Kenya. The monitoring is carried out by the national regulator on STI, i.e. the National Commission on STI (NACOSTI), which produces a report to the relevant ministry on an annual basis on the status of MEL framework implementation against targets. Efforts are underway to enhance inclusivity by synergising indicators under the new, more comprehensive STI policy, which addresses both global and local issues. The R&I policy custodians have undertaken the initiative to align the MEL framework with globally accepted standards (interview; 2023).

As part of steps towards developing a MEL, Lesotho has developed a log frame with outputs, actions, timelines, and indicators including budgets, and responsible entities. This was with support from the OACPS-PSF. Lesotho is currently exploring, through a partnership with AUC-NEPAD, possible routes to engage the National Statistician-General to conduct STI surveys that are aligned with

the national policy instruments in place. Although there are no timelines indicating the development of the MEL framework and its metrics, the government has highlighted the need to prioritise the integration of an effective system for the implementation, monitoring, and evaluation of the national STI policy.

The Government of Mozambique has developed STI indicators that have a regional alignment but are also in line with the recommendations of the Frascati and Oslo manuals. These two manuals were developed by the OECD to serve as a guide on the measurement of R&I and its broader economic implications. This was achieved with support from AUDA-NEPAD. Monitoring and evaluation of the policy is still a challenge in Mozambique. This has led to the production of monthly, trimester, semester, and annual reports. A higher education publication of STI indicators was considered to review the indicators every two years following the 2003 policy. However, the 2006 policy advocated for MEL short-term (three-year review intervals), medium-term (six-year reviews), and long-term (10-year reviews). With effective implementation, these interventions will improve the MEL process.

Zambia – There is a focus on setting up an STI database through collaboration with various stakeholders, including the Zambia Statistics Office. Due to the lack of an MEL framework and indicators, it is difficult for the government to determine how much the government and business/private sector and other actors are contributing to research and development. An R&I survey tool is being developed and scheduled to be carried by the partners. This will lead into the creation of the STI database, thereby facilitating an effective MEL of the STI system. A notable threat to ACP countries' R&I policies is the lack of a framework to enumerate researchers and innovators. The adoption of databases for MEL becomes crucial in this context, particularly as digital repositories gain significance in democratising information and data under open science and open data policies. Building on such national examples presents an opportunity to achieve long term MEL targets.

4.4 OPPORTUNITIES FOR TRANSFORMATION

ACP countries have an opportunity to leverage the technological revolution in operationalising their MEL frameworks and activities in ways that contribute to transformation. The availability of digital learning tools presents an opportunity to transform ACP countries' MEL and align it with global good practices. Integrating digital platforms, artificial intelligence, and big data analytics can streamline the monitoring and evaluation process, providing real-time insights and facilitating evidence-based decision-making.

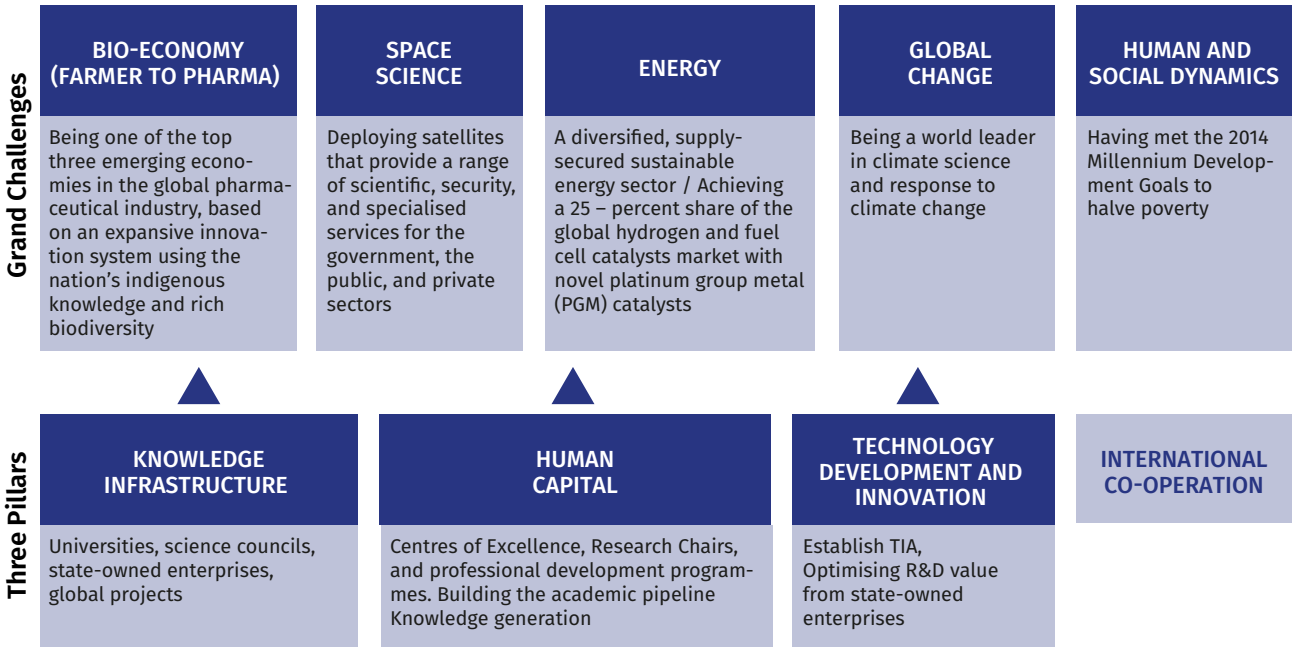
ACP countries can leverage regional and international collaboration to share experience and best practices in R&I MEL. Establishing networks, partnerships, and platforms for knowledge exchange can foster mutual learning, allowing countries to adapt successful strategies from their counterparts. Interventions that are provided by international agencies including the UN IATT, OACPS and UNESCO among others, through continued STI policy training and alignment of national policies to SDGs, have the potential to transform STI policy implementation in line with MEL targets that can be adopted at

national, regional, and international levels. The OACPS Mutual Learning Exercise PSF support presents a great opportunity for countries that have yet to review or to formulate new STI policies towards sustainability. In line with the theoretical framework of this Handbook, transformative MEL frameworks will only be achieved with dedicated capacity development and integration of new specific case studies as evidenced in this Handbook. This, therefore, needs more efforts in supporting national and regional STI policy development structures.

4.5 CASE STUDIES ON MEL

South Africa has developed and is implementing a MEL framework for STI through interventions of the National Advisory Council on Innovation (NACI). Key to this framework is that it takes into consideration the theory of change during implementation of a ten-year innovation plan. **Figure 4** shows that the innovation plan highlights the pillars that are designed to drive change in key sectors of the economy. The NSI players constitute the three pillars. The framework allows a holistic approach to MEL and a sectoral focus to addressing key societal challenges. The key lessons for ACP countries are that monitoring and evaluation has to be factored into existing long-term national priorities with a feedback mechanism. This also helps in accounting for budget commitments across the different sectors that drive the economy and it is done in alignment with the theory of change (ToC) as presented.

Figure 4 **Ten-year innovation plan based on theory of change**



Source: NACI, 2020

Monitoring and evaluation have been highlighted as weak areas by different countries, potentially impacting R&I policy implementation with a corresponding impact on ACP economies. However, there are opportunities for improvement. A practical approach involves monitoring towards both short- and long-term goals. In the case of national R&I strategies and policies, there is a need for new MLE frameworks and tools, or the implementation of existing ones.

In view of the numerous policies that are either at the development stage or undergoing implementation, a few lessons were learned that could guide the MEL process. Countries have different levels of demonstrated R&I policy MEL frameworks in place and being implemented with indicators (see **Table 5** below).

Table 5 - Process in the development of Monitoring frameworks and implementation in OACP countries

Country	Status of R&I policy	Status of MEL framework	Status of MEL implementation	M&E tools and indicators
Cameroon	R&I policy under development	No MEL framework	Not implemented	Indicators are rudimentary in that they are not yet fully established
Ethiopia	R&I policy in place	MEL framework under development	Implementation framework is currently being developed	Indicators outlined in STI policy
Gambia	R&I policy in place	No framework constituted (though a three-year report is issued)	Not implemented	No indicators in place
Guinea	R&I policy under development	There are established committees to administer MEL with personnel to administer the implementation	Not implemented	No deliberate or nationally adopted national indicators
Kenya	R&I policy elaborated but not approved	Implementation framework conceptualised	No MEL in place	Indicators in place and aligned
Lesotho	An advanced R&I policy framework	Implementation framework conceptualised but not operational	Not implemented	Some indicators are in place but not fully adopted.
Mauritania	R&I strategy in place	No efficient MEL framework in place	No implementation	The MEL indicators are in place
Mozambique	R&I policy developed but yet to be approved	Log frame with indicators in place	Not implemented	Indicators with regional alignment in place
Namibia	R&I policy in place	No framework in place	Not implemented	No indicators were established.
Seychelles	R&I policy in place	No definitive framework	No MEL implementation	No indicators and instruments operationalised.
Tanzania	R&I policy in place	No MEL framework	No implementation	No defined indicators
Timor-Leste	R&I policy under development	No MEL framework	No implementation	No defined indicators
Zambia	R&I policy in place	No MEL	No implementation	No indicators

Source: Authors

4.6 RECOMMENDATIONS

A MEL framework provides a key to the long-term sustainability of the R&I policy implementation process and development impacts from R&I policies. It provide a platform for ensuring accountability and supports effective governance of R&I policies. It is also the basis upon which recommendations for review of the policies can be made. To achieve these goals, MEL tools need to remain relevant and dynamic to accommodate the changing nature of R&I policy implementation and its need for evolving instruments.

To attain transformative innovation policy (TIP) implementation status, it is necessary to focus on long-term multi-systems change and the three dimensions of the SDGs – economic, social, and environmental, alongside the harmonisation of national, regional, and international actors, instruments, policies, and regulations. Adoption of an MEL framework that is aligned with the TIP is essential as traditional evaluation frameworks associated with standard logical frameworks and theories of change do not adequately focus on long-term systems change and the SDGs. An effective TIP involves formative evaluation, as opposed to summative evaluation. Formative evaluation provides a better basis for learning, adaptability and achieving transformative outcomes. Against this backdrop, below are some recommendations that, if implemented, would help address the persistent MEL challenges in ACP countries and beyond.

- Develop a robust MEL framework, its log frame, and indicators as part of policy formulation. The implementation of the MEL frameworks and accompanying theory of change must adequately focus on long-term systems change as articulated in the SDGs.
- Mainstream MEL as part of broader policy monitoring strategies under the national planning and statistics agencies and involve key actors such as the Statistician-General (national statistics offices) in the collection of R&I policy and MEL indicators.
- Ensure sustained commitment to the implementation of the MEL frameworks and plans beyond their formulation.
- Identify MEL expertise in the R&I ecosystem and develop MEL capacity where needed.
- Ensure that MEL frameworks are standardised and aligned to regional and international indicators, especially those that track the achievements of the SDGs. Moreover, ensure that the MEL indicators inform the planning process during the budget session to facilitate resource allocation towards R&I policy implementation as well as downstream investment.

5 Capacity and Skills Development for R&I Policies

Strengthening capacity and skills for R&I policies is crucial for the sustainable development of ACP countries. This chapter explores the existing capacities in R&I and provides insights on building capacities in areas where they are currently lacking. It highlights the challenges faced by ACP countries, the interventions that can be implemented, opportunities for transformative change, case studies of good practices, and recommendations for enhancing R&I capacity.

5.1 OVERVIEW

Effective R&I policies require a robust foundation of capacity and skills development to navigate the complexities of a rapidly evolving technological landscape and to address the diverse needs of societies.

Several ACP countries have demonstrated commitment to augmenting their human capital and institutional assets by instituting targeted training programmes. However, the landscape of R&I capacity and skill development is marked by substantial challenges.

The effectiveness of R&I policies in many ACP countries is threatened by the absence of a critical mass of high capacity and skills, which poses a common impediment to the optimal implementation of research and innovation policies. This constraint has led to misalignments with other areas, highlighting the pressing need for comprehensive capacity-building efforts.

In response to these challenges, ACP countries must prioritise efforts to enhance their R&I capacity, address skill gaps, and bolster their research and innovation ecosystems. By doing so, they can unlock their full potential, harnessing R&I to drive sustainable development and confront multifaceted global challenges. These endeavours should be closely aligned with their respective national development agendas, emphasising the critical role of robust R&I capacities in driving holistic progress.

Investing in capacity and skills development for R&I policies is an investment in the future. Countries that prioritise the continuous learning and growth of their workforce in the field of research and innovation are better positioned to address global challenges, foster sustainable development, and lead in the era of transformative discoveries.

5.2 MAIN CHALLENGES AND WHY THEY HAVE PERSISTED

This section delves into the R&I capacity and skill development challenges landscape in ACP countries. Using the MLE case study countries as a representative sample size for ACP countries, the table below presents a summary of the capacity status in various ACP countries, addressing their efforts and challenges in the field of R&I capacity building. Table 6 presents some of the key challenges, collected from countries' interviews during the MLE.

Table 6 - R& I Capacity Building Skills Development	
Country	**Challenges associated with R&I funding**
Cameroon	Challenges involve the renewal of research staff, the development of effective communication strategies, and the modernisation of research infrastructures.
Ethiopia	Features a significant number of universities and research institutions but faces challenges related to research infrastructure and quality assurance, necessitating skill enhancement.
Gambia	Struggles with limited capacities for R&I policy-making, focusing on the STI sector. Misalignment with other sectors and the need for capacity building among decision-makers are persistent challenges.
Guinea	Lacks a critical mass in the R&I sector, primarily due to the sector being unattractive with low wages.
Kenya	Employs a multi-stakeholder consultative mechanism for developing human capital within STI institutions. Weak regular training to stay up-to-date.
Lesotho	Lacks a communication strategy for STI policy implementation and demonstrates minimal evidence of STI-based case studies.
Mauritania	Faces challenges due to inadequate human capacity, hindering effective progress in R&I initiatives.
Mozambique	Initiating research programmes and implementing a human research development strategy for STI.
Namibia	Has the capability to formulate R&I policies but faces challenges in translating them into effective implementation. Additionally, there is a weak capacity for the development of research and funding proposals.
Seychelles	Faces challenges related to human qualification, staff turnover, limited access to credible information, inadequate IP framework, and knowledge transfer gaps between industry and universities.
Tanzania	Weak capacity for R&I policy-making, relying on external experts for drafting policies. There is a need to enhance understanding of STI beyond ICT at the national level.
Timor-Leste	In the process of building human and institutional capacity for implementation, primarily due to a limited number of PhD degree holders.
Zambia	Presence of substantial human capital but faces deficiencies in research infrastructure. Emphasis needed on enhancing quality assurance measures and addressing skill mismatches.

Source: Authors

The table above highlights the multifaceted challenges in R&I capacity and skills development across various ACP countries.

In The Gambia, the struggle lies in building capacities for R&I policy-making, particularly in achieving alignment with other sectors. This misalignment poses a hurdle to harmonising national development goals. Conversely, Kenya has adopted a commendable multi-stakeholder approach to developing human capital in STI institutions. The country places significant emphasis on staff training, ensuring that researchers remain abreast of the latest developments in the field.

The main challenge is the limited or weak capacities for R&I policy-making, which encompass various dimensions at both institutional and individual levels, as highlighted in the MLE case study. Several countries face constraints in building robust capacities for

effective R&I policy-making, potentially hindering the formulation and implementation of strategic policies. This might be due to several factors, such as:

- Weak internal capacity for policy development/review, as well as a lack of skills for proposal writing targeting international funding. This also means reliance on external experts for policy drafting, which might indicate a gap in internal expertise, which may affect the ownership and alignment of policies with national goals. Policies formulated by external experts might not fully reflect the specific needs and priorities of the country. This misalignment could hinder the effective contribution of the R&I sector to national development goals.

- Limited critical mass in the R&I sector: this includes staff turnover and scarcity of highly qualified individuals. Challenges related to the size and expertise of the workforce within the R&I sector, including issues like staff turnover and a scarcity of individuals with advanced degrees, particularly PhDs.

- Weak capacity for R&D and innovation data collection and analysis. This aspect highlights a specific deficiency in the ability to collect and analyse data related to R&I. Another prevalent issue faced by many countries is the lack of data, statistics, and accurate information, particularly in the realm of knowledge management. This scarcity hinders the development of evidence-based policies.

- Weak understanding of STI beyond ICT at the national level: some countries encounter difficulties in comprehending STI beyond ICT, indicating a need for broader awareness and knowledge.

In general, ACP countries face challenges related to research infrastructure and knowledge gaps. Issues surrounding the adequacy of research infrastructure and ensuring the quality of research outputs pose significant challenges, impacting the overall research environment. Addressing these challenges is pivotal in building a workforce equipped with the necessary competencies to navigate and overcome impediments in the R&I landscape.

  - Weak research infrastructures. A key challenge lies in the modernisation of research infrastructures, which is crucial for enhancing the overall research capabilities and ensuring relevance in contemporary contexts. Many countries, including Cameroon and Tanzania, struggle with the modernisation of their research infrastructures. For example, Cameroon is grappling with obsolete research facilities and a lack of adequate communication strategies, hindering their efforts in these domains. Ethiopia's challenge revolves around research infrastructure and quality assurance.

  - Knowledge transfer gaps between industry and universities, and an inadequate IP framework. Challenges persist in facilitating the smooth transfer of knowledge between academic institutions and industry. Additionally, there are concerns about the inadequacy of intellectual property (IP) frameworks to safeguard innovations. Furthermore, there is a lack of skills essential for guiding prospective innovators through the complete value chain. This gap may hinder the effective development and implementation of innovative ideas.

Another significant challenge is the limited capacity for outreach. This encompasses the ability to effectively disseminate information about research and innovation initiatives, hindering broader engagement and collaboration within the innovation ecosystem.

5.3 POLICY TOOLS AND INSTRUMENTS: MAIN INTERVENTIONS, OPERATIONALISATION, AND IMPACTS

Evidence collected from desktop research and interviews from ACP countries indicates a general weakness in R&I capacity for policy development across countries. Despite this overarching challenge, it is evident that governments, organisations, and institutions play a crucial role in mitigating this weakness. They serve as key facilitators by providing essential tools and instruments, including resources, infrastructure, and policies that create an enabling environment for the development of capacity and skills required for effective R&I policies.

- **Enhance capacities for R&I policy-making** through comprehensive capacity reinforcement programmes and the establishment of knowledge-sharing platforms. This can be achieved through:
  - Capacity reinforcement programmes. Implementing capacity reinforcement programmes and relevant training workshops is crucial to address weak capacities for R&I policy-making. Workshops and seminars also play an essential role in enlightening political decision-makers about the vital importance of R&I to national development. Collaborative efforts with government agencies are pivotal for formulating sound and evidence-based R&I policies that foster an enabling environment, particularly by crafting tailored policies aligned with the evolving landscape of research and innovation. The establishment of a multidisciplinary team of experts can also further contributes to this objective.
  - Ecosystem reinforcement and multi-stakeholder approach. To operationalise these tools, a multi-stakeholder approach is crucial. ACP governments, research institutions, industry, and civil society organisations should collaborate to develop policies, allocate resources, and implement initiatives that promote R&I capacity development. It is essential to create supportive regulatory frameworks, provide funding mechanisms, and establish monitoring and evaluation systems to track progress and ensure the effectiveness of these tools in driving the transformation of R&I capacity in ACP countries. Reinforce the R&I ecosystems to foster collaboration among academia, industry, and government at regional and local levels. This can include establishing research and innovation hubs, incubators, and technology parks to encourage entrepreneurship, knowledge transfer, and the development of local solutions.

University Partnerships - Forge partnerships between universities and research centres to establish dedicated R&I hubs. These hubs should serve as incubators for innovative ideas, fostering collaboration between academia and industry.

Industry Engagement - Encourage companies to actively participate in the R&I ecosystem by collaborating with research institutions and funding R&I initiatives. Incentivise private sector investment in R&I through tax benefits and public-private partnerships.

Support Structures - Strengthen support structures like technology transfer offices and business incubators to facilitate the transformation of research outcomes into practical applications. Provide training to these structures to enhance their effectiveness.

- Knowledge Sharing Platforms. Creating platforms and networks that facilitate the exchange of knowledge, best practices, and lessons learned. These platforms can enable policy-makers, researchers, innovators, and institutions to collaborate, share resources, and learn from each other's experiences. Encouraging peer-to-peer learning can be achieved through mentorship programmes, virtual communities of practice, and online forums.

- Collaboration among policy-makers. Facilitating interactions between policy-makers from the ACP regions and their international counterparts is key to fostering a global perspective on R&I policy formulation and implementation. Additionally, engaging in mutual learning exercises between countries can significantly contribute to the creation of collaborative knowledge-sharing environments, further enriching the R&I landscape.

- **Strengthen research infrastructures and address knowledge gaps** through strategic investments, a robust capacity-building approach, and the exploration of innovative solutions such as fostering interdisciplinary collaborations and leveraging advanced technologies.

  - Investment in relevant infrastructure. Investment in relevant infrastructure to grow institutional capacity. Investment in modernising and expanding research laboratories and facilities is essential. Upgrading equipment and technology ensures that researchers have access to state-of-the-art tools, fostering a conducive environment for cutting-edge research. Establish collaborative research spaces and hubs that encourage interdisciplinary interactions. These spaces can facilitate the exchange of ideas, promote cross-disciplinary collaborations, and create a vibrant research community. Ensure access to specialised equipment through strategic investments. This could involve creating shared facilities or partnerships with industry to provide researchers with access to tools that might be prohibitively expensive for individual institutions. Anticipate future needs by investing in infrastructure that supports emerging technologies such as artificial intelligence, blockchain, and quantum computing. This forward-looking approach ensures that research capabilities remain at the forefront

of technological advancements. Investing in digital infrastructure, such as broadband connectivity and affordable internet access, to ensure that knowledge resources and digital tools are accessible anywhere. This can enhance connectivity, enable remote collaboration, and provide researchers and innovators with access to global information and markets.

- Recognition of Indigenous Knowledge. Recognising and valuing IKS, along with grassroots and frugal innovations, as valuable reservoirs for research and innovation. This entails integrating indigenous knowledge into research projects, engaging local communities in decision-making processes, and establishing mechanisms to safeguard and preserve traditional knowledge.

- Tailoring programmes to focus specifically on training and upskilling the workforce in emerging technologies, digital literacy, and research methodologies is also paramount. These programmes should aim to bridge the skills gap and enable individuals to leverage the opportunities offered by digital transformation. Policies and programmes that provide innovation and entrepreneurship training equip researchers and innovators with the skills and knowledge necessary to navigate the commercialisation process and establish successful start-ups. These initiatives offer specialised training programmes, mentorship, and support services to help individuals bridge the gap between research and market applications.

A capacity-building approach to address knowledge gaps and enhance capacities for R&I policy-making. The constraints highlighted in the previous section have resulted in misalignments with other areas, underscoring the critical necessity for thorough capacity-building efforts. In response to these challenges, ACP countries must prioritise efforts to enhance their R&I capacity, address skill gaps, and bolster their research and innovation ecosystems. Through these concerted efforts, countries can unlock their full potential, leveraging R&I as a catalyst for sustainable development and as a means to address effectively the myriad global challenges they face.

It is essential for ACP countries to establish efficient and sustainable R&I ecosystems. A crucial step in this endeavour is the gradual implementation of a well-structured training system, encompassing a diverse range of stakeholders such as experts, researchers, doctoral students, next generation students, the general public, policy-makers, and implementation agencies in the STI field. The overarching aim is to foster self-reliance and internal capacity within the countries, reducing their reliance on external consultants. This approach follows a gradual and phased strategy, focusing on educating and empowering individuals and institutions within the country's STI ecosystem. Instead of frequently turning to external consultants, the primary objective should be to develop and foster the development and nurturing of local expertise over time, thereby establishing a self-sustaining system. Table 7 shows capacity building in the STI ecosystem.

Table 7 - Potential impact of targeted R&I capacity building levels		
Target Audience	**Level**	**Capacity or Benefit**
Experts	Individual	Enhanced expertise and knowledge in STI.
Researchers and Doctoral Students	Individual	Improved research capabilities, innovation skills, and problem-solving abilities.
Next Generation Students	Individual	Nurtured talent, critical thinking, and creativity.
General Public	Individual & Structural	Informed and engaged citizens with STI understanding.
Citizens	Individual & Structural	Active participation, informed decision-making, and community engagement.
Policy-makers	Structural	Informed policy decisions aligned with STI goals.
Implementation Agencies	Individual & Structural	Enhanced project management, problem-solving, and technical skills.
Private Organisations	Structural	Enhanced innovation, R&D capabilities, and competitiveness.
Non-Profit Organisations	Structural	Strengthened capacity to address STI-related social issues.
Public Organisations	Structural	Improved ability to drive STI policies nationally.
Diaspora Talent	Individual & Structural	Leveraging expertise, knowledge transfer, global collaboration, return of skilled workers

Source: Authors

In practical terms, this approach involves substantial investments in diverse training programmes, workshops, and educational initiatives targeting a broad audience. This includes decision-makers, policy-makers, STI professionals, researchers, and doctoral students. Additionally, it entails enhancing local institutions such as universities, research centres, and government agencies, enabling them to assume the crucial role of training and mentoring individuals within the ecosystem.

Furthermore, active engagement with the diaspora, comprising professionals originating from the ACP countries now residing abroad, is imperative. By offering incentives, ACP nations can harness the skills and expertise of their diaspora community. This engagement can manifest in multiple ways, ranging from encouraging them to return to their home countries to fostering research collaborations, knowledge-sharing networks, and mentorship programmes.

Key benefits of the capacity-building approach:

- Cost Efficiency - A gradual capacity-building approach reduces the need for costly external consultants, resulting in substantial financial savings.
- Sustainability - By nurturing local and diaspora expertise, this model ensures ongoing growth, reducing reliance on external assistance over time.
- Tailored Solutions - Local and diaspora experts possess an in-depth understanding of their country's unique challenges, enabling them to devise more effective and context-specific solutions.
- Knowledge Retention - Building internal capacity ensures that valuable knowledge and expertise remain within the country, contributing to its long-term development.
- Empowerment - The training and engagement of decision-makers, institutions, researchers, doctoral students, and the diaspora empower them to take charge of STI initiatives and drive national development objectives.

5.4 OPPORTUNITIES FOR TRANSFORMATIVE CHANGE

Enhancing capacity and skills for the formulation and implementation of targeted R&I policies, strategies, and regulations is crucial to unlocking the true potential of R&I in effectively addressing both existing and emerging challenges. The growing interest and attention in enhancing capacity and skills for R&I policies are becoming increasingly evident across the ACP.

Seychelles is laying the foundation for a robust STEM environment marked by successful extracurricular activities in schools and dedicated STEAM (Science, Technology, Engineering, Arts, and Mathematics) programme training for students. Notably, there is a strong emphasis on directly engaging parents and families to raise awareness about the importance of STEM education. Collaborative efforts, such as participation in initiatives like Africa Code Week, contribute significantly to promoting digital literacy (source: interview data).

Guinea is actively implementing solutions to enhance educational quality, featuring a «Training of Trainers» programme aimed at elevating the overall standard of education. The country is also evaluating its education system through CAMES (Conseil Africain et Malgache pour l'Enseignement Supérieur) and has instituted a quality-focused evaluation system. Additionally, ongoing training on results-based management (RBM) within the Public Service Department (PSD) demonstrates Guinea's commitment to continually improving its education sector (source: interview data).

Cameroon actively participates in ongoing South-South cooperation initiatives with BRICS nations. Furthermore, the country collaborates closely with the African Union (AU) to facilitate the training of researchers from diverse African nations. These efforts aim to enhance mobility and knowledge exchange, ultimately playing a pivotal role in the development and implementation of innovative solutions (source: interview data).

While these efforts to further sustainable R&I capacity and skills development are commendable, more is needed. Opportunities that can substantially contribute to fostering transformative change with lasting developmental impact and ensuring sustainability encompass:

- Modernisation of research infrastructure, technical training, and equipment management;
- Youth researcher training and mobility programmes;
- Sub-regional research collaboration, innovative partnerships;
- Glocalisation of research, improving research priorities;
- Expertise and knowledge sharing.

5.5 CASE STUDIES ON CAPACITY

The scarcity of services for creative talent is fuelling a paradigm that requires new thinking to reach beneficiaries and achieve impact. Building on good practices with existing providers such as incubators, mentors, academic institutions, and others, will develop a novel mechanism where the existing service ecosystem can be consolidated, and the demand aggregated to provide a more effective footprint and impact when and where it is needed. This is a new approach that can fill gaps in both urban and rural areas to support talent where the opportunities are.

Namibia has made commendable strides in fortifying its R&I capacity. The pivotal player in this progress is the National Commission on Research, Science, and Technology (NCRST), which assumes a crucial role in fostering and coordinating research, science, and technology endeavours within the country. The NCRST has been instrumental in enhancing R&I capacity by extending financial support, grants, and assistance to researchers, scientists, and innovators. The Namibia University of Science and Technology (NUST), as a prominent institution for higher education and research in Namibia, has significantly contributed to the nation's R&I capabilities. The university offers a diverse array of research programmes and has established research centres dedicated to pivotal domains such as renewable energy, environmental sciences, and information technology.

Kenya, particularly through the National Commission for Science, Technology, and Innovation (NaCOSTI), demonstrates a strong commitment to capacity building in research and innovation (R&I). Specialised institutions like the International Livestock Research Institute (ILRI) and organisations such as the Centre for Disease Control (CDC), Kenya Industrial Research and Development Institute (KIRDI), Kenya Marine and Fisheries Research Institute (KMFRI), and Kenya Forestry Research Institute (KIMFRI) contribute to a thriving research ecosystem, focusing on critical sectors like agriculture, health, and technology. Kenya promotes regional knowledge sharing through programmes like the entomology programme and collaborations with INCIPE in West Africa, serving as a robust model for ACP countries aiming to develop their R&I capacity (source: interview data).

An illustrative case is the «Meet after School STEAM Club for Girls» in Cameroon, showcasing a skills development initiative geared towards young girls. This programme, supported by the Visiola Foundation, is sustained through individual and corporate

sponsorships. It is designed to mentor and empower African girls and young women, nurturing their potential as future leaders in fields such as science, technology, engineering, and innovation. Through an intensive coding boot camp lasting several weeks, participants are prepared for job and internship opportunities.

The cases above exemplify the transformative potential of targeted programmes in empowering individuals, with a particular focus on women and girls, to enhance capacity and skills development for R&I policies. Through active involvement in practical projects, mentorship, and hands-on learning experiences, these initiatives not only cultivate essential skills but also inspire a new generation of policy-makers, innovators, and scientists. Such programmes play a crucial role in narrowing the skills gap, reinforcing the innovation ecosystem, and propelling socio-economic development across ACP countries. They underscore the paramount importance of creating inclusive and accessible opportunities, ensuring that every talent is harnessed in the dedicated pursuit of excellence in research and innovation policies.

5.6 RECOMMENDATIONS

In response to the dynamic and transformative changes sweeping the global landscape, ACP countries are urged to reinforce their capacity and skills for R&I policies. To further strengthen R&I capacities in ACP countries, the following recommendations can be considered:

- **Capacity reinforcement**. Establish capacity-building programmes that provide training and skill development opportunities for policy-makers as well as targeted training for leaders in the field to ensure effective decision-making, strategic planning, and stakeholder engagement. Recognise the importance of leadership and management skills in the successful implementation of R&I policies. Emphasise the pivotal role of leadership and management skills in the seamless execution of R&I policies. Acknowledge that these competencies are integral to navigating the complexities of the R&I landscape and achieving successful policy outcomes. Structure training modules to hone the decision-making proficiency of policy-makers. Provide practical insights and case studies to empower them with the tools necessary for making informed and strategic decisions in the fast-paced realm of R&I. Introduce mechanisms for regular skills assessment and feedback loops. This ensures that training programmes evolve in tandem with the evolving demands of R&I policy-making, offering continuous improvement opportunities.

- **Inclusivity and diversity:** (Also see **Chapter 6**) Fostering inclusivity and diversity in R&I capacities ensures a rich tapestry of perspectives. A diverse workforce, representing different backgrounds, experiences, and disciplines, brings creativity and varied problem-solving approaches, essential for the complex challenges in R&I policy-making.

- **Institutional strengthening for robust R&I governance**. Focus on institutional strengthening to fortify the governance structures overseeing R&I policies. This includes reinforcing regulatory frameworks, improving coordination mechanisms, and enhancing the overall capacity of institutions involved in R&I decision-making. Implement measures to streamline administrative processes, ensuring efficiency and effectiveness in the implementation of R&I initiatives.

- **Measuring impact and assessment**. (Also see Chapter 4) Implement mechanisms to assess and measure the impact of R&I policy. Regularly assess outcomes and adjust strategies based on the evolving needs of the R&I landscape to maximise the effectiveness of these initiatives.

- **Promoting international cooperation**. Foster cross-country collaboration through joint research projects, knowledge sharing platforms, and exchange programmes to facilitate learning and promote best practices. Encourage collaboration with international partners, organisations, and research institutions to leverage expertise, resources, and funding opportunities. Participate actively in regional and global R&I initiatives, enabling access to a wider pool of knowledge and fostering partnerships for knowledge transfer and joint projects.

- **Adaptability and innovation:** The R&I landscape evolves rapidly. Professionals must be adaptable and open to innovation, ready to embrace new technologies, methodologies, and paradigms. Continuous learning and staying ahead of emerging trends are essential components of a vibrant R&I workforce.

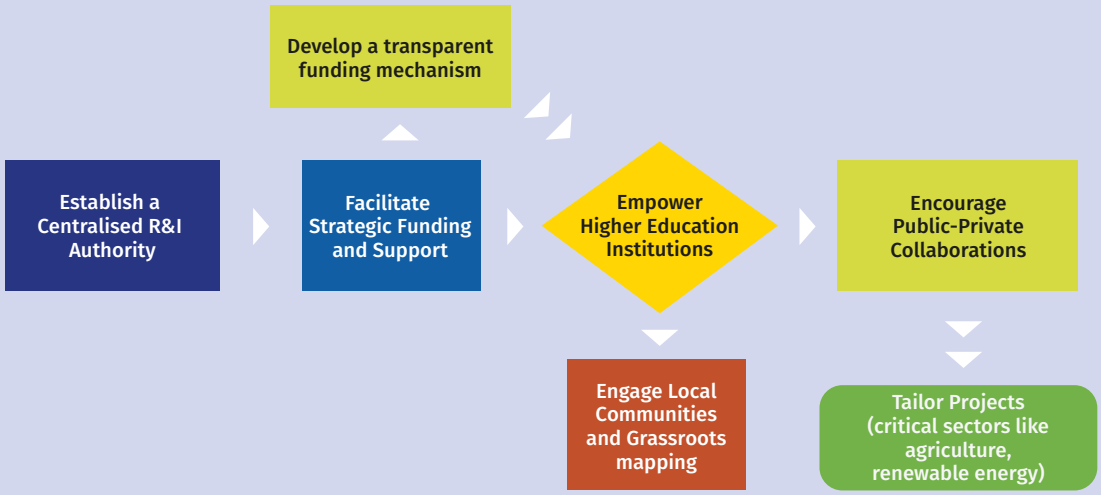
- **Investment in infrastructure and skills development.** Investment in relevant infrastructure to grow the institutional capacity. Increase investment in education systems, particularly in STEM fields, to nurture a skilled workforce capable of driving R&I activities. Take a holistic approach to skill development, encompassing not only technical expertise but also interpersonal skills crucial for effective collaboration and communication within the policy-making sphere. Enhance vocational training programmes and apprenticeships to bridge the gap between academia and industry, fostering innovation-driven entrepreneurship.

These recommendations can support ACP countries in addressing weaknesses in their capacities in R&I policy-making and create an environment conducive to innovation and sustainable development. Sustained commitment, collaboration, and support from governments, international partners, and relevant stakeholders are paramount in propelling the transformative journey of R&I, unlocking the countries' full potential. Moreover, while enhancing R&I capacity, ACP countries must address three pivotal questions: How can they ensure that investments in R&I capacity is aligned with their economic and societal needs? How can they enhance the quality of their R&I infrastructure, without necessarily striving for world-class status immediately, but gradually advancing toward international standards? How can universities play a substantial role in cultivating a high-quality R&I system that drives economic growth?

BOX 3 :
Blueprint for Strengthening R&I Capacity in ACP Countries

Implementing sound interventions in ACP countries requires careful planning and a phased approach. Here is a simplified guideline on how to strengthen R&I capacity and implement such interventions: **Figure 5** shows the key steps in capacity building planning.

Figure 5 **Schematics diagram of key R&I capacity planning steps**



Source: Authors

- **Establish a Centralised R&I Authority** - Create a dedicated body responsible for coordinating and advancing R&I activities within the country. Empower this authority to allocate resources, provide funding, and offer essential support to researchers, scientists, and innovators.
- **Facilitate Strategic Funding and Support** - Develop transparent mechanisms for funding R&I initiatives, including grants and financial backing for promising projects. Encourage public and private sector collaboration in funding R&I endeavours.
- **Cultivate Collaborative Ecosystems** - Promote partnerships between academia, industry, and government to create an environment conducive to knowledge exchange and innovation. Establish technology transfer offices to expedite the transformation of research outcomes into practical solutions.
- **Empower Higher Education Institutions** - Invest in research-oriented programmes and centres within universities, focusing on areas aligned with national development goals. Leverage higher education institutions as hubs for research and innovation.
- **Engage Local Communities and Grassroots Mapping** - Involve local universities and researchers in shaping R&I strategies, ensuring they align with local needs. Conduct grassroots mapping to identify untapped resources and harness local knowledge for innovation.
- **Encourage Public-Private Collaboration** - Foster partnerships between public entities, private enterprises, and non-governmental organisations to amplify R&I efforts. Create incentives for the private sector to invest in R&I through tax incentives and public-private partnerships.
- **Tailor Projects** - Identify critical sectors, such as agriculture, healthcare, and renewable energy, and focus R&I efforts on addressing challenges in these areas. Tailor projects to local needs, ensuring relevance and impact.

6 Achieving Inclusiveness in R&I Policy-making

The global pursuit of the SDGs underscores the unanimous recognition of the imperative for inclusivity and leaving no one behind. Despite a heightened emphasis on inclusion, the fields of STI and STEM maintain a pronounced level of exclusivity on a global scale. In the realm of R&I policy-making, inclusivity transcends mere stakeholder involvement; it involves actively integrating perspectives, knowledge, and experiences from a diverse spectrum of actors. This ensures that policies resonate with the unique needs and challenges of the entire population. To this end, this chapter will address issues related to promoting inclusiveness in R&I policy-making, specifically exploring indigenous knowledge, gender, youth, and inclusive innovation beyond product and processes on how they support policy-making or otherwise. Inclusiveness also ties into capacity building (see **Chapter 5**) especially in STEM-related training related to gender and marginalised groups in society.

6.1 OVERVIEW

For R&I policies to play a pivotal role in the comprehensive set of measures required to facilitate the transition of socio-technical systems to address global challenges, a fundamental shift in government policy-making is imperative. This necessitates adopting a more systemic perspective on problems and embracing a holistic and inclusive approach to R&I policy-making and interventions.

Throughout the MLE exercise, inclusiveness emerged as a crucial factor for the R&I policy development process, particularly in terms of incorporating the interests of a diverse range of stakeholders. Many countries view inclusiveness as a catalyst for bolstering capacity in R&I policy formulation, along with providing the necessary resources for R&I solutions that can enhance the economies of ACP countries. Consequently, integrating inclusiveness into the policy formulation and implementation processes becomes imperative to ensure the full utilisation of available capacities and the creation of opportunities for tapping into diverse sources of knowledge and expertise. The conceptualisation and implementation of an inclusive R&I policy, along with its associated structures, is also instrumental in creating opportunities for marginalised individuals within their communities. Participants in the MLE also emphasised the significance of robust stakeholder engagement, focusing on equity and accessibility across diverse groups. Key aspects highlighted include not only the integration of inclusivity and diversity in R&I policy-making but also of indigenous knowledge systems, the promotion of STEM education for girls, and efforts to reduce the digital divide. The access to technology tools for supporting R&I policy formulation and implementation was deemed essential.

Inclusive innovation initiatives extend to grassroots, frugal, and social innovation, aiming to encompass a broader range of voices and perspectives. «Inclusive innovation» projects, as defined by the OECD (2015), represent initiatives explicitly designed to benefit lower-income and marginalised populations.

These projects often involve adapting existing technologies, products, or services to more effectively address the specific needs of these marginalised groups. Through a detailed exploration of these dimensions, this chapter seeks to contribute to the broader dialogue on fostering inclusivity in the ever-evolving R&I landscape.

Gender equality is emerging as a significant focus within R&I policies. The table below illustrates that numerous countries have elevated gender equality to a priority in their R&I policies. Furthermore, specific policies acknowledge the crucial importance of indigenous knowledge systems in science, technology, and innovation. This is exemplified by the national science, technology, and innovation policy of Zambia. **Table 8** presents key highlights on inclusiveness in R&I policy with specific country scope, statements, and position as enshrined in their policies, planning documents and related material under the relevant authorities.

Table 8 - Gender equality in R&I policy

Country	Gender equality in R&I policy
Cameroon	Gender equality in R&I policy is emphasised as a cornerstone in the recommendations for crafting the inaugural R&I strategy, bolstered by the backing of the PSF. Inclusiveness stands out as a pivotal pillar in these recommendations, underlining the commitment to ensuring gender equality permeates to the core of R&I strategy formulation.
Ethiopia	Building a culture of science, technology, and innovation by creating an organisational and operating system that enables the development and utilisation of indigenous knowledge
Gambia	According to one policy statement: The Gambia Government will promote STI acculturation in all gender categories of society through the adoption and application of knowledge acquisition and assimilation. The government will also improve the diffusion of STI knowledge to facilitate society's participation in innovative scientific and technical programmes that will improve the living conditions of its citizens.
Guinea	In the recommendations for formulating R&I strategy and policy, supported by the PSF, inclusiveness stands as a central pillar.
Kenya	Gender mainstreaming in STI is one of the policy priorities
Lesotho	Gender mainstreaming is a key element in the draft R&I policy.
Mauritania	Gender perspective is embedded into the R&I strategy.
Mozambique	Increasing the number of women in scientific research, especially in the STEM field, is one of the priorities outlined in the draft policy, emphasising gender equality, inclusion, and equity.
Namibia	To improve gender equality and mainstreaming in STEM is one of the priorities.
Seychelles	Not explicitly included.
Tanzania	Participation of women in the promotion and utilisation of science and technology.
Zambia	Promote the participation of women and girls in science, technology and innovation is one of the objectives of the policy.

Source: Authors

6.2 MAIN CHALLENGES AND WHY THEY HAVE PERSISTED.

There are demonstrated efforts to address inclusiveness in the ACP countries' R&I policy implementation. Nevertheless, despite recent efforts, several persistent challenges persist, particularly concerning the inclusion of IKS, gender, and youth but also of grassroots, frugal, and social innovation. Achieving inclusiveness in R&I policy-making encounters persistent challenges rooted in systemic, social, and organisational factors. The main challenges are highlighted below:

- **Limited representation and implicit bias:** under-representation of diverse voices, including women, youth, minorities, and marginalised communities, poses a primary challenge. Traditional power structures and biases within policy-making processes can result in the exclusion of certain groups, hindering inclusivity in decision-making. In Cameroon for example, there is still an in balance in female and male employees in the ministry responsible for R&I policy formulation, which could have implications for adoption and shared perspectives. A notable gender imbalance persists in the participation of women in the STI sector, primarily stemming from historical marginalisation in the uptake of STEM-based subjects, resulting in fewer women engaging in these fields. Gender mainstreaming proves to be a significant challenge, clearly evident in the imbalance observed during R&I policy formulation and broader participation. Unconscious biases within institutions and policy-making bodies perpetuate exclusionary practices. These biases influence decision-makers' perceptions, unintentionally sidelining certain groups or perspectives. Furthermore, limited awareness about the importance of inclusiveness in R&I policy-making hinders progress. Policy-makers and stakeholders may not fully recognise the benefits of diverse perspectives or the innovation potential arising from inclusive practices.

- **Cultural challenges in policy development:** The current scenario in many countries is marked by a notable lack of collaboration between academia and the local community, exacerbated by negative perceptions surrounding indigenous knowledge. Differences in culture and language create communication barriers, impeding the efficient exchange of ideas and concerns. Policy-making processes that neglect diverse cultural perspectives inadvertently sideline valuable insights, hindering inclusiveness. In Namibia, efforts are underway to translate national policies into all local languages to promote inclusivity. A significant challenge lies in the historical exclusion of most indigenous groups native to the country from policy formulation during the past decades.

- **Lack of policy for youth researchers:** A notable challenge lies in the absence of dedicated policies catering to youth researchers and the formulation of effective succession plans. This gap hinders the seamless integration of the youth demographic into R&I policy-making and jeopardises the continuity of leadership within the field. Addressing this void is crucial for fostering inclusivity and ensuring a robust pipeline for future R&I policy-makers.

- **Lack of inclusive innovation:** a notable gap exists in recognising and incorporating the valuable contributions that grassroots and frugal innovations can make toward fostering inclusivity in the innovation landscape. These approaches enable the development of solutions that are not only affordable but also accessible to a broader range of stakeholders. Despite their potential to bridge gaps and promote inclusivity, frugal innovations are frequently disregarded in formal policy-making processes. The exclusion of grassroots and frugal innovation from R&I policy-making is a missed opportunity to tap into the wealth of localised knowledge, creativity, and resourcefulness. Policy-makers have made only a few efforts to actively seek ways to incorporate and support these initiatives within the policy framework. Creating avenues for dialogue, recognising the value of localised solutions, and providing financial and institutional support for grassroots and frugal innovations are essential steps toward achieving a more inclusive R&I policy-making landscape.

Even with the formulation of inclusive policies, challenges may still emerge during their implementation. Resistance to change, bureaucratic hurdles, and a lack of commitment to inclusiveness can undermine the successful execution of inclusive R&I policies. For instance, recognising the significance of IKS and frugal innovation as key elements in STI is a recent addition to R&I policy-making. However, there is still much to be accomplished in terms of effective implementation. These challenges extend beyond R&I policy formulation, providing opportunities for a broader approach to knowledge creation and management. Countries are transitioning from a sole focus on scientific knowledge to include other realms, such as IKS. This shift acknowledges that many indigenous knowledge holders resonate more with a broader concept of knowledge that is inclusive to their perspectives.

Lack of capacity building: The inadequacy of training and capacity-building programmes poses a potential obstacle to the effective engagement of specific groups in R&I policy-making. This issue is especially pertinent for individuals from underrepresented communities who may encounter barriers in acquiring the requisite skills and knowledge necessary for active participation in the policy-making process. Disparities in access to resources, encompassing funding, education, and technology, hinder the participation of individuals from disadvantaged backgrounds. This unequal access impedes engagement in R&I activities and limits contributions to the policy-making process.

Fragmented collaboration: Collaboration among stakeholders may be fragmented or insufficient, posing a challenge to inclusiveness in R&I policy-making. Effective policy-making requires coordinated efforts across sectors, and a lack of collaboration can impede progress in developing comprehensive and inclusive policies. For instance, in Tanzania, a noticeable issue arises in coordinating inclusiveness among stakeholders, where the responsible Ministry for Research and Innovation is often unaware of inclusive initiatives within universities. Adopting inclusive R&I policies entails engaging with all relevant stakeholders to understand the role of policy in their lives and the impacts they observe. Inclusiveness must take centre stage in aligning cultural, knowledge systems, and gender considerations, presenting challenges that demand proactive solutions.

6.3 POLICY TOOLS AND INSTRUMENTS: MAIN INTERVENTIONS, OPERATIONALISATION AND IMPACTS

There are notable interventions that are examples of inclusive R&I policies and instruments in the ACP countries, as demonstrated by participating counties of this MLE. This section builds upon the preceding section of challenges, outlining specific interventions aimed at addressing these obstacles and elevating policy-making in ACP countries. Survey results from participating countries underscore the pivotal role of inclusiveness as a key strength, creating opportunities for robust R&I policy formulation and implementation. Countries embracing inclusive strategies, especially in areas such as gender inclusivity, are well positioned to develop and implement effective R&I policies.

Table 9 highlights some policy instruments supporting inclusiveness and their country specific implementation. The idea is to demonstrate a practical approach to inclusiveness in the ACP region and to show how these can be replicated.

Table 9 - Typical policy instruments deployed to address gaps in policy formulation and implementation

Selected inclusiveness policy interventions	Policy instruments, tools and approaches being used in inclusiveness	How the inclusiveness policy instruments, tools and approaches are operationalised
Cultural challenges in policy development	Knowledge-based economic advancement through the adoption of diverse knowledge sources using conventional methods is essential for inclusive R&I policy formulation. Creating a linkage between science and local knowledge: facilitating collaboration and exchange between scientific approaches and traditional/local knowledge. Establishing platforms for dialogue and shared understanding between scientific and indigenous communities. Flexibility and mutual understanding: incorporating flexible frameworks that recognise the dynamic nature of indigenous knowledge. Promoting mutual understanding between traditional knowledge holders and modern researchers. Creating, developing, and protecting intellectual property (IP) on indigenous knowledge. Establishing mechanisms to create awareness and documentation of indigenous knowledge.	Formulation of IKS policies and strategies to synergise with R&I policies, garnering broad stakeholder participation. In a quest for knowledge-based economies, IKS policies are becoming part of national strategies e.g., Kenya and Ethiopia have embraced and operationalised IKS strategies. Empowerment of marginalised communities to contribute to socio-economic development. A notable example is Ethiopia's 2020 R&I policy, which integrated the IKS framework for effective implementation. Use of community radio stations and promotion of native languages through folklore and tales. Translation of policies into local vernacular for inclusiveness e.g., Namibia is translating five policies for inclusiveness. East Timor's INCT institutional policy advocates and supports gender mainstreaming and funding for IKS.

Table 9 - Typical policy instruments deployed to address gaps in policy formulation and implementation

Selected inclusiveness policy interventions	Policy instruments, tools and approaches being used in inclusiveness	How the inclusiveness policy instruments, tools and approaches are operationalised
Cultural challenges in policy development	Developing robust intellectual property frameworks to protect the rights of indigenous communities. Promotion of Research on Indigenous Knowledge: Encouraging and funding research initiatives focused on indigenous knowledge systems. Supporting institutions and researchers engaged in the exploration and documentation of traditional knowledge. Adoption of IKS policies to promote local products and solutions. Prioritisation of native language use in public and official contexts	
Limited representation and implicit bias	Prioritising STEM education for girls, women, and disabled individuals to foster inclusivity. Communication campaigns and awareness programmes: creating targeted communication campaigns to raise awareness about the importance of gender inclusivity in R&I policy development and activities. Implementing educational programmes to foster an understanding of the role of diverse genders in the innovation ecosystem. Formulating and implementing policies that safeguard and promote gender inclusiveness within the R&I sector. Establishing protective measures to ensure equal opportunities and representation for all genders. Adoption of gender-supporting policies. Additional interventions include the development of a STEM curriculum that emphasises problem-based learning, exposing learners to a hands-on approach where they actively engage in solving challenges rather than merely defining them.	Broadening the scope of R&I policy-making to ensure gender inclusiveness, incorporating gender-sensitive policies. Establishment of gender and equity ministries and departments, as exemplified by initiatives in countries like The Gambia. Implementation of special projects that promote gender mainstreaming, e.g., the Silkworm project in Namibia.
Lack of policy for youth researchers	Promoting R&I policy hacks with youth participation in formulation and implementation. Designing customised programmes that specifically cater to the needs of youth, ensuring inclusivity and gender balance. Tailoring initiatives to foster an environment that encourages the active participation of young individuals in R&I activities. Incentives for talent attraction: introducing start-up visa initiatives to attract and retain youthful talent within the ACP countries.	Establishing coordinated youth support structures dedicated to fostering innovation, entrepreneurship, and access to funding. Examples include technology hubs equipped with specialised resources. Notably, Lesotho has instituted a technology hub within the university to cater specifically to the needs and aspirations of the youth. Creates incentives for talent attraction within ACP countries. Zambia, for instance, provides STI Youth Funds and supports junior engineers, technicians, and scientists (JETS) through national fairs.

Table 9 - Typical policy instruments deployed to address gaps in policy formulation and implementation		
Selected inclusiveness policy interventions	**Policy instruments, tools and approaches being used in inclusiveness**	**How the inclusiveness policy instruments, tools and approaches are operationalised**
Lack of policy for youth researchers	Offering incentives that motivate young innovators to contribute to the vibrant R&I landscape.	
Lack of inclusive innovation	Implementation of policies aimed at fostering grassroots initiatives and frugal approaches involves several key strategies. These measures are designed to empower local communities, enabling them to effectively address their specific needs and challenges through cost-effective and innovative solutions. Incorporating frugal innovation into R&I policies is a holistic approach to ensure accessibility, affordability, and relevance to diverse populations. This involves emphasising grassroots and frugal innovation, tailoring solutions to the unique context of each community. This integrated approach fosters inclusiveness by recognising and addressing the specific needs and challenges of different regions and demographics. The success of these policies lies in their ability to create an enabling environment where local communities can actively participate in the innovation process, leading to solutions that are not only cost-effective but also impactful and sustainable. To encourage the development of inclusive innovations, there is a focus on supporting the use of advanced technologies. This includes initiatives that can serve as platforms for multiple services. Research institutions are incentivised to orient their research towards creating solutions that are inclusive and accessible. One crucial aspect of operationalising these policies is to ensure that regulatory impediments do not hinder innovations designed to serve the poor, especially in public services. This involves striking a balance where critical quality standards are met while avoiding constraints on innovations beneficial to low-income groups. Addressing regulatory challenges becomes essential when entrepreneurs working on solutions for low-income communities adopt a perspective that is neither purely for-profit nor purely social. Finding the right balance is crucial for the success and sustainability of these initiatives. Moreover, developing credit options is seen as a valuable strategy to smooth consumption patterns among the poor. This approach caters to this market by providing firms with more stable income through predictable demand.	Integration of frugal innovation into R&I policies to ensure accessibility, affordability, and relevance to diverse populations. Emphasising grassroots and frugal innovation enhances inclusiveness by tailoring solutions to the unique context of each community. M-PESA, a mobile payment company has become virtually ubiquitous in Kenya (though it was unable to develop successfully elsewhere due to regulatory impediments).

6.4 OPPORTUNITIES FOR TRANSFORMATIVE CHANGE

Achieving transformative R&I policy formulation and implementation requires a commitment to inclusivity, leveraging unique opportunities related to the demographic dividend, socio-economic imbalances, gender equity, and social status.

The technologies linked to the fourth industrial revolution offer a transformative opportunity to narrow the gap between marginalised communities and urban areas. An illustrative example is the provision of online access to public services through initiatives like «Smart-Bots» in Botswana. This rural connectivity project establishes hotspots in village centres and administration infrastructure, facilitating internet access. This initiative not only addresses the digital divide but also enhances accessibility to essential public services, marking a significant stride towards inclusivity in the digital era.

A key area of transformation is the adoption of digital technologies to bridge the digital divide between urban and rural areas, thereby affecting the ability of those in rural areas to equitably access services. Kenya, for example, has started investing in drone technologies for several uses. A common example is the planting of trees throughout the country using drone technology to disperse seeds, in an effort to mitigate the effects of climate change.

Several countries highlighted opportunities for transformation to meet the UN 2030 agenda and SDG 5 on inclusiveness and gender mainstreaming. Although these aspirations must be met through the implementation of dedicated STI policy instruments, it remains to be seen if these will deliver on the SDG's. Inclusiveness addresses key issues of inequitable distribution of resources in society. For example, Goal 4 of the SDGs on inclusive and equitable quality education and promotion of life-long learning opportunities for all is key and relevant for many ACP countries, which still have a marginalised or traditional education system.

Intellectual property rights (IPR) and R&I policy linkages have been highlighted as essential for economic gain. In Lesotho, under the recommendation of the OACPS PSF, the government will mobilise IKS and grassroots innovations, nurture the talent of ordinary citizens outside the education system, and strengthen the effective protection of intellectual property rights and enforcement mechanisms. For this traditional knowledge to be successfully regulated and commercialised, efforts to effectively protect it through IPR, create safe repositories for preservation and conservation, and establish support programmes for its promotion are overdue. Mobilising IKS, frugal and grassroots innovations, reinforcing effective protection and enforcement mechanisms for intellectual property rights, and establishing an open data platform for research and innovation can contribute significantly to bolstering bottom-up job creation and fostering economic growth (OACPS PSF PRR Lesotho, 2022).

6.5 CASE STUDIES ON INCLUSIVENESS

It is worth noting that there are some case studies that demonstrate outcomes of inclusiveness in R&I policy-making, either through previous direct efforts at national, community or even institutional levels. These often result in a more inclusive society with impactful innovative solutions because of interventions. In these case studies, two solutions that resulted from inclusiveness awareness and action were demonstrated in Kenya and Namibia as outcomes of prior efforts in R&I policy formulation.

Kenya's M-pesa. An interesting case of inclusiveness in Kenya is the M-pesa technological revolution that addressed a huge challenge in financial inclusion in Kenya and East Africa. There are similar cases in ACP countries where many small, medium and micro enterprises (SMMEs) and individuals could transact through a digital platform with a huge socio-economic impact across the region, with several attempts to replicate elsewhere. This case shows how inclusiveness can lead to improvement in livelihoods. M-pesa was initiated to tackle the challenge faced by many SMMEs, which are part of the unbanked majority that constitute the informal sector. Transactions were always a challenge as cash flow posed challenges to enterprises. The use of a mobile phone application initially on unstructured supplementary service data USSD-enabled handsets made it easy to conduct transactions by using the mobile phone numbers as a virtual account that could exchange monetary value between customers and SMMEs without cash transactions.

Wild Silk Project. The Namibia example of inclusiveness with wild silk manufacturing opportunities involves local communities, targeting inclusiveness for specific communities and gender mainstreaming. The Kalahari Wild Silk Company, Namibia's manufacturer of wild silk, produces quality products that are in demand internationally. It started as a project five years ago, with the objective to eradicate a species of moth that was responsible for livestock and wildlife mortalities. Local women account for 50% percent of shareholders. It has operated as a private company and gets funding from the government, among other funding organisations, following its conceptualisation stage. It supports the participation of marginalised women in communities and is a good example of inclusiveness.

The **Working to Advance STEM Education for African Women (WAAW)** Foundation is a dedicated organisation committed to advancing STEM education among African girls. It accomplishes this through innovative and interactive educational camps that aim to kindle interest in science and technology. These camps actively engage girls in creative and practical projects, fostering not only knowledge but also a sense of empowerment. WAAW has earned recognition for its impactful approach, receiving nominations for various awards that acknowledge its contributions to building STEM skills and knowledge among young African women. Through these camps, WAAW not only imparts education but also empowers girls to pursue careers in science and become catalysts for change within their communities.

The **Women in Science (WiSci) Girls STEAM Camp** by World Learning serves as an exemplary model for establishing a foundation that sustains girls throughout their careers. WiSci, a public-private partnership involving the U.S.

Department of State, the United Nations Foundation's Girl Up campaign, and tech companies Intel and Google, brings together a hundred high school girls from across Africa and the U.S. annually. Held in Malawi during the previous summer, this programme exposed participants to transformative experiences, such as converting mobile phones into microscopes and attending leadership seminars. Moreover, it encouraged cross-cultural collaboration, leading to innovative solutions, like a shoe equipped with a built-in battery charger powered by the wearer's movement. WiSci also facilitated connections with mentors in scientific fields, offering guidance on projects and career development.

Some examples of specific interventions aimed at addressing obstacles to achieving inclusiveness in R&I policy-making in ACP countries include:

In Lesotho, in 2018, the National University of Lesotho took a significant step by establishing an **innovation hub** dedicated to promoting innovation and incubating innovative firms. The primary objective is to stimulate job creation and involve various players within the ecosystem. Notably, the NUL Innovation Hub goes beyond traditional academic education by incorporating enterprise development into the national university curriculum. These initiatives have played a pivotal role in encouraging the youth in Lesotho to engage in a more inclusive ecosystem. This ecosystem not only focuses on academic education but also emphasises enterprise learning as a means of fostering inclusivity. Inclusive and socioeconomic equitable and quality education is seen as transformative, in line with SDG 4. Lesotho's aspirations are to achieve gender equality and empower all women and girls, as enshrined in UN SDG #5. A young population demographic is seen as a strength for the country. The prevailing attitude towards the commercialisation of indigenous knowledge from the country is considered a hindrance to transformation.

The Gambia is proactively implementing and advancing inclusiveness in R&I policy-making. Alongside other ACP countries, The Gambia is leveraging the UNESCO SAGA project to effectively promote inclusiveness and address the global gender gap in STI fields, spanning all levels of education and research. As part of this initiative, The Gambia has undertaken a review of its existing national STI policy, incorporating recommendations from the SAGA implementation. Additionally, a dedicated gender unit has been established within the Gambian Ministry of Higher Education, Research, Science, and Technology, with concurrent strengthening of existing units in higher education institutions across the country.

Ethiopia's STI policy has integrated cultural, social and gender aspects into policy implementation. In addition, the incorporation of the IKS framework has been strengthened, ensuring its full inclusion in both the prioritisation and implementation of STI policy.

The formulation of Cameroon's draft R&I strategy prioritised inclusivity through a bottom-up approach, with a particular focus on gender equality and addressing vulnerable populations and sectors. This approach involved cross-fertilizing ideas from urban to rural areas, adopting best practices, establishing farmer schools, and promoting research output-based decision processes. The draft strategy envisions a transformative role for women in the STI sector, emphasising encouragement for women to pursue STEM training. Additionally, ongoing efforts seek

to harmonise STI policies across ministries to enhance inclusivity. Activities such as encouraging youth participation and showcasing research outputs during Youth Day events contribute significantly to fostering inclusiveness among the youth.

In Guinea, gender mainstreaming is integrated across all ministries, with specialised centres in universities to augment these efforts. The introduction of STI awards specifically for women in the country serves as a notable highlight for promoting their active participation and inclusiveness in the field. To stimulate the engagement of all gender groups, Guinea conducts annual research and innovation awards. Additionally, the introduction of Scientific Research Week and efforts to promote youth participation in government sectors are among the various initiatives undertaken to enhance inclusivity in the country.

Kenya has embedded gender mainstreaming as a constitutional right, extending recognition to youth and people with disabilities. This inclusive approach extends beyond the domain of STI to various sectors, ensuring the accommodation of women in the informal economy. Additionally, Kenya utilises indigenous crops and trees to promote and preserve genetic resources adapted to the region's adverse climate and drought conditions. The Kenyan government, through the Youth Enterprise Development Fund, facilitates youth and women's participation in the procurement process. Initiatives like iHub and the government's procurement framework provide avenues for youth enterprises, aligning with the affirmative action policy that reserves a minimum of 30 percent of government contracts for businesses led by youth, women, and other disadvantaged groups. Notably, the Kenyan Government has crafted a sectoral plan for gender, youth, and vulnerable groups, incorporating specific and targeted instruments and tools (Government of Kenya, 2018).

The R&I strategy in Mauritania is inherently inclusive and aligns with SDGs 5 and 16, focusing on creating an inclusive society, yet there is room for improvement. Mauritania prioritises ancestral knowledge and artisanry in its national strategies for transformation. To enhance inclusivity, efforts have been made through social media and other platforms to popularise R&I initiatives among the general public, ensuring widespread adoption and feedback collection. This approach is particularly effective in Mauritania's multicultural and multilingual society: "Social media is used to track the KPI of inclusiveness promotion through social media platforms like Facebook (source: interviews)".

Cameroon adopts cross-fertilization of ideas from urban to rural areas and incorporates good practices, exemplified by the establishment of farmer schools and the popularisation of a research output-based decision processes. Farmer field schools (FFS) represent a widely embraced approach globally, facilitating the transfer of specialised knowledge, skill promotion, and empowerment of farmers. With at least 10 million farmers in 90 countries having attended such schools, FFS employ facilitators to implement participatory, discovery-based learning rooted in adult education principles.

Seychelles' STI practices under its blue ocean economy strategy are strategically targeted along the value chain to enhance inclusiveness by promoting businesses that contribute to specific fishery resources value chains. Recognising the significance of women's participation, the country actively involves

and trains women in inclusive activities. Seychelles is committed to transforming its economy to embrace inclusiveness, a key aspect of its national prioritisation of STI initiatives within the mainstream blue economy strategy. However, there are existing gaps in gender inclusiveness in education that still require attention and addressing.

Specialised programmes in Kenya, such as the Women Enterprise Fund, provide affordable credit and business support to women entrepreneurs. During MTP II, Ksh.9.79 billion was disbursed, benefiting 891,917 women, with an additional 956,493 women trained in entrepreneurship skills. Since its 2007 inception, the fund has disbursed Ksh.10.8 billion, promoting financial inclusion for over 1.39 million women by 2017. The Uwezo Funds aim to expand financial access for youth and women businesses at the constituency level, fostering gainful self-employment. The fund disbursed Ksh.5.52 billion to 61,675 groups, benefitting 920,162 individuals, who received training in entrepreneurship skills (Government of Kenya, 2018).

Furthermore, many countries highlighted gender mainstreaming as a cross cutting R&I policy instrument across many ministries, including in national strategic planning units, as well as the fact that inclusiveness campaigns are gaining momentum across member countries.

6.6 RECOMMENDATIONS

Inclusiveness in the formulation and implementation of R&I policies is crucial, both at local and international levels. The following key recommendations are proposed:

- **Sector-Wide Inclusiveness Policies:** promote inclusiveness policies across all sectors of the economy. ACP countries should adopt and integrate such policies as integral components of their broader actions toward inclusiveness.
- **Gender Mainstreaming:** prioritise gender mainstreaming as a fundamental aspect of promoting inclusivity. This involves encouraging the active participation of previously disadvantaged communities, ensuring diverse perspectives in R&I policy formulation and implementation.
- **Integration and Synergies:** integrate common policies and identify synergies that specifically promote inclusiveness. This approach ensures a cohesive and coordinated effort across various sectors, maximising the impact of inclusivity measures.
- **Engaging the Diaspora**: tap into the intellectual capital of the diaspora for R&I policy dialogues and inclusion. Leveraging the expertise and insights of the diaspora contributes to a more comprehensive and globally informed policy-making process.
- **Incorporating IKS:** recognise IKS as a critical component in the decision-making process and include them in supporting policy formulation. This acknowledgment ensures that diverse knowledge sources contribute to the development of inclusive R&I policies.

- **Empowering Women and Youth Leadership:** place women and youth in strategic positions within R&I structures to popularise STI in society. This empowerment ensures diverse representation and perspectives in decision-making processes.

- **Incentivising Female Participation:** introduce incentives such as scholarships specifically designed for girls and women to actively involve them in shaping and formulating R&I policies. This approach aims to address historical gender disparities in STEM fields.

- **Promoting STEM Education for All:** encourage both boys and girls to actively participate in STEM subjects at school. This shift challenges traditional norms, ensuring inclusivity in R&I policies compared to previous practices that marginalised girls.

- **Promoting Grassroots and Frugal Innovation:** integrate frugal innovation into R&I policies, emphasising cost-effective and locally adaptable solutions to address the unique challenges faced by marginalised communities. Encourage the development of grassroots innovations by providing policy support, financial assistance, and platforms for showcasing locally-driven solutions. Acknowledge and value local expertise, ensuring that grassroots and frugal innovations are recognised, protected, and integrated into broader innovation ecosystems.

- **Capacity Building at the Local Level and Collaboration with Local Stakeholders:** invest in capacity building initiatives at the local level to empower communities to develop and implement their innovative solutions effectively. Foster collaboration between policy-makers, researchers, and local stakeholders to co-create solutions that address the specific needs of communities at the grassroots level.

- **Bridging the Digital Divide:** address the digital divide by providing online services to marginalised communities. This strategy ensures their inclusion in the R&I policy-making process, fostering broader participation and representation.

- **Alignment with SDGs:** align national R&I policies with the inclusiveness goals outlined in the United Nations' SDGs and the Agenda 2063 of the AU. This alignment enhances the impact of R&I policies, contributing to broader societal inclusivity.

7 Prioritisation and Alignment of R&I Policies

In this chapter, we delve into the complexities surrounding prioritisation and (mis)alignment in R&I policies, also in relation to national priorities, within ACP countries. By providing an overview, analysing the main issues, exploring interventions, identifying opportunities for transformation, presenting a case study of good practice, discussing relevant tools, and offering recommendations, this chapter aims to guide policy-makers in making informed decisions to maximise the transformative potential of R&I policies.

7.1 OVERVIEW

The development of a national strategy for R&I is a key commitment in the government's addressing economic and societal challenges with a clear mandate to work with all stakeholders to strengthen R&I ecosystem, drive reform and collaboration, and enhance outcomes that contribute to meeting societal, economic and global challenges.

The impact of the R&I policy is heightened when it closely aligns with crucial government, societal, and economic priorities. This alignment encompasses priorities such as economic recovery and resilience for the next decade, addressing sectoral and societal challenges such as climate change and digitalisation, and contributing to global and regional challenges in the context of the SDGs and the Agenda 2063. It is imperative that the R&I policy harmonises seamlessly with government strategies and national policy agendas to maximise its impact and effectiveness.

The policy landscape for science, technology, and innovation is increasingly embracing bottom-up approaches to shape strategic agendas for R&I. This shift aims to encompass a diverse range of challenges and priorities, engaging multiple stakeholders at both the national and broader levels.

The significance of setting clear priorities in the realm of R&I policies cannot be overstated. By defining and prioritising key areas of focus, ACP countries can channel their resources, efforts, and expertise effectively. This allows for a targeted and concentrated approach, ensuring that limited resources are allocated where they can have the most significant impact. This deliberate prioritisation is especially crucial in navigating the complexities of R&I, where competing challenges and opportunities abound.

Prioritising and aligning R&I policies in ACP countries is a multifaceted process. It involves understanding each country's unique development goals, assessing the strengths within their contexts, and adapting to evolving global trends and emerging technologies. This comprehensive approach aims to create a conducive environment for sustainable development and innovation. The challenges faced by certain ACP countries, like The Gambia's struggle to focus on R&I amidst competing priorities, underscore the importance of aligning R&I efforts with a nation's core challenges and aspirations.

Furthermore, staying informed about global trends and technological advancements is essential for shaping effective R&I strategies. For

instance, Kenya's approach to prioritising R&I by implementing government requirements and empowering regulatory bodies demonstrates how adapting to global paradigms can drive R&I progress.

Overall, the prioritisation and alignment of R&I policies in ACP countries are vital steps towards harnessing the transformative potential of research and innovation and ensuring their development trajectories remain relevant in an ever-evolving global landscape.

7.2 MAIN CHALLENGES AND WHY THEY HAVE PERSISTED

ACP countries face several key issues in the prioritisation and alignment of R&I policies. Firstly, limited financial resources and inadequate funding mechanisms hinder the development and implementation of effective policies. The findings from both desktop research and interviews shed light on the challenges related to R&I prioritisation that some ACP countries encounter.

Inadequate prioritisation

In numerous ACP countries, the absence of prioritisation in R&I policy presents a challenge to effective development and progress. Without a deliberate emphasis on prioritisation, valuable resources and efforts risk being dispersed across a wide spectrum, diluting the potential impact of R&I initiatives. This lack of focus has the potential to impede the strategic allocation of resources, introducing inefficiencies and resulting in missed opportunities for impactful innovation. Furthermore, the absence of prioritisation can result in a fragmented R&I landscape, where various stakeholders pursue disparate goals without a unified vision. This lack of cohesion may lead to missed synergies and collaboration opportunities, hindering the overall impact of R&I initiatives.

- In the case of The Gambia, R&I is not accorded sufficient priority, as there are multiple competing priorities that dilute the effectiveness of R&I efforts. Moreover, there is a misalignment between the challenges faced by the country and the areas identified for R&I policy interventions. This lack of focus and coordination hampers the successful prioritisation of R&I activities in The Gambia.
- This is due to competing priorities and a failure to align R&I efforts with the actual challenges faced by the nation.

In various countries, priorities are often dictated more by political considerations than by the genuine needs of the nation, resulting in misalignments with actual national priorities.

Weak coordination

Weak coordination in R&I policy further compounds the challenges faced by many ACP countries. When coordination is lacking, various stakeholders may operate in silos, working independently without a unified approach. This fragmentation can result in duplication of efforts, inefficient resource utilisation, and missed opportunities for collaboration. This silo mentality not only prevails between distinct institutions and agencies but also within the same entities. This issue becomes even more pronounced when formulating R&I policies, considering the cross-cutting nature of STI.

- For instance, in Mauritania, although there is a body called the High Council of Scientific Research and Innovation, led by the prime minister, responsible for setting the R&I strategy and orientation, the dissemination of this strategy has not been effectively cascaded to the ground level. The implementation is underway and led by the Ministry of Higher Education and Scientific Research and other entities.2 Additionally, a silo culture prevails, where different entities operate independently, impacting the prioritisation of STI activities.

- This is due to a lack of integration across sectors and the absence of collaborative efforts to harmonise STI activities.

Lack of clear policy framework

Without a well-defined policy framework, R&I efforts may lack strategic direction, hindering the alignment of initiatives with broader national goals. A clear framework provides a structured roadmap, guiding the prioritisation of R&I activities, resource allocation, and the establishment of measurable objectives. It also aids in fostering a common understanding among stakeholders, facilitating coordination and collaboration within the R&I ecosystem.

- Guinea faces a distinct challenge — the absence of a clear framework for R&I prioritisation. For instance, the previous national development plan (the Plan National de Développement Économique et Social de la Guinée 2016-2020 -PNDES) focused on past priorities that did not align with the R&I needs of the country. This inconsistency and absence of a clear framework hinder the effective prioritisation of R&I initiatives in Guinea.

- This is due to the absence of a comprehensive, up-to-date framework that could guide the prioritisation of R&I efforts and ensure their relevance and impact.

The following challenges are the most prominent and often cited by policy-makers with regard to priority setting: resource constraints, issues of prioritisation, and coordination.

- Resource constraints - alignment, coordination and monitoring processes cost money and require time and specific skills. These resources are scarce and often insufficiently allocated to MEL, thereby making it inherently difficult for policy-makers to implement and execute a proper STI framework.

- Prioritisation - long-term projects, or those that are less visible to the public eye, tend to get less priority from politicians and the departmental hierarchy. However, focusing too much on designing and introducing new policies comes with a high risk of getting stuck in a cycle of introducing new policies without ever knowing whether your interventions work.

- Coordination - ownership of R&I and STI policies should be felt by all ecosystem actors. Ownership of policies can sometimes become a bit vague after policies have been implemented and priorities set, which can substantially hamper coordination efforts when departments and agencies start pointing at each other.

7.3 POLICY TOOLS AND INSTRUMENTS: MAIN INTERVENTIONS, OPERATIONALISATION, AND IMPACTS

Data collected from interviews and MLEs highlights the varying R&I prioritisation in different ACP countries. While some countries exhibit weak R&I prioritisation others demonstrate significant progress. The efforts in R&I in Zambia are driven by a strategic approach that aligns with the National Development Plan.[43] By considering achievable goals within the policy period, Zambia aims to ensure that its R&I efforts are realistic and potentially impactful. The consultation process with major stakeholders, including traditional leaders, highlights the importance of inclusive decision-making and the recognition of diverse perspectives. The identified priorities of energy, health, and education reflect Zambia's commitment to addressing key areas that have the potential to drive socioeconomic development. Energy, in particular, is recognised as a cross-cutting priority with significant potential in wind energy and the extraction of green hydrogen, aligning with global efforts towards renewable energy solutions. By prioritising health and education, Zambia aims to improve the well-being and human capital of its population, investing in essential sectors that contribute to long-term sustainable development.

Kenya's commitment to prioritising R&I is exemplified through the establishment of the Konza Technopolis Development Authority (KotDA)[44]. The allocation of dedicated land for R&I infrastructure (such as Konza city the 'Silicon Savannah'), including masterplans, laboratories, education centres, and residential facilities, underscores Kenya's acknowledgment of the crucial role that dedicated spaces play in facilitating research and innovation activities. This infrastructure investment reflects the country's commitment to creating an enabling environment that nurtures R&I growth. By providing essential physical infrastructure, Kenya aims to cultivate a conducive ecosystem for researchers, innovators, and institutions to thrive, contributing significantly to the nation's socioeconomic development.

Namibia's approach, aligning R&I priorities with the National Development Plan and conducting stakeholder consultations, underscores the critical significance of coordinated innovation for national development. This strategy involves major stakeholders in aligning innovation policies with national development goals and prioritisation, reflecting a comprehensive and collaborative commitment to advancing the country's socio-economic objectives.

Table 10 provides an overview of the primary challenges and typical policy instruments deployed to address gaps in prioritising R&I in ACP countries. It also offers policy instruments, tools, and approaches to address these challenges.

43 Zambia's 8th National Development Plan (NDP) launched by Zambia's Ministry of Finance and National Development - https://www.mofnp.gov.zm/

44 Source: interview data.

Table 10 - Typical policy instruments deployed to address gaps in policy prioritisation

Challenges	Policy Instruments, Tools, and Approaches	Operationalisation
Harmonising prioritisation efforts	Aligning with national priorities and stakeholder consultation - Namibia aligns R&I priorities with the National Development Plan and conducts stakeholder consultations for effective prioritisation. Addressing the challenge of lack of prioritisation requires a strategic shift towards a more structured and purposeful approach. This involves robust assessments of national needs, continuous monitoring of emerging trends, and the development of frameworks that guide the prioritisation process. By embracing prioritisation, nations can enhance the effectiveness of their R&I policies, ensuring that resources are directed where they can make the most substantial contributions to societal progress and sustainable development.	Formulation of IKS policies and strategies t
Enhancing coordination	Addressing the issue of coordination necessitates the establishment of mechanisms that facilitate collaboration among government bodies, research institutions, industry players, and other relevant stakeholders. A well-coordinated R&I ecosystem enhances the efficiency of resource utilisation, promotes knowledge sharing, and accelerates the translation of research findings into practical innovations.	Establish interagency collaboration. Encourage collaboration among different government agencies responsible for R&I to ensure a cohesive approach. Create a dedicated interagency task force that meets regularly to share information, align priorities, and strategize on joint initiatives. Facilitate public-private partnerships (PPPs). Foster collaborations between public institutions, private enterprises, and academia to pool resources and expertise. Promote regional collaboration. Facilitate collaboration between neighbouring ACP countries to share resources, expertise, and research findings. For instance, the East African Community (EAC) promotes regional collaboration in various sectors, including science and technology.
Establishing clear prioritisation frameworks	Crafting comprehensive prioritisation frameworks for R&I - many ACP countries lack a clear prioritization framework.	Framework development for innovative progress - develop a comprehensive prioritisation framework aligned with current challenges. Develop a national R&I strategy. Formulate a comprehensive national R&I strategy that outlines clear goals, priorities, and mechanisms for cross-sectoral collaboration. E.g., Kenya's Vision 2030 includes a well-defined national strategy that aligns R&I goals with broader development objectives.

Source: Authors

7.4 OPPORTUNITIES FOR TRANSFORMATIVE CHANGE

Despite the challenges faced by ACP countries, there are opportunities for transformative change through the prioritisation and alignment of R&I policies. By strategically identifying and addressing global and regional priorities, countries can drive sustainable development and address pressing issues.

One area of global priority is the environment and green sustainability. ACP countries are aware of the pressing need to address the impacts of climate change, safeguard their natural resources, and embrace more sustainable approaches. Through R&I policies focused on environmental conservation, renewable energy, and sustainable agriculture, these countries can contribute to global efforts towards a greener and more sustainable future. Addressing food security and water scarcity is another crucial global priority. By investing in R&I to improve agricultural productivity, develop drought-resistant crops, and enhance water management systems, ACP countries can ensure food security for their populations and contribute to global food systems.

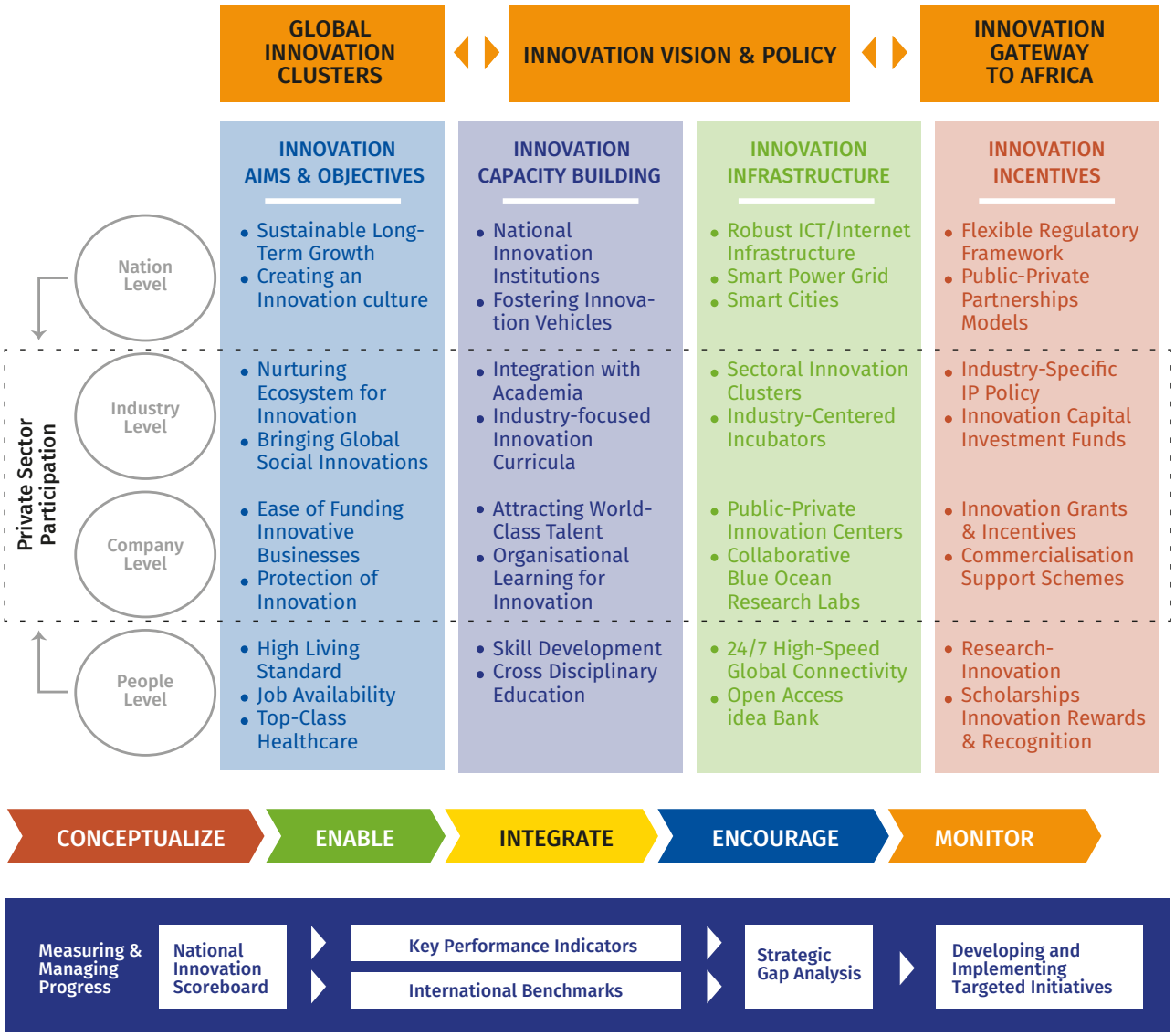
Opportunities for transformative change through the prioritisation and alignment of R&I policies in ACP countries can be realised through various means:

- Optimising Existing Policy Instruments - Utilising existing policy instruments, like the Agenda 2063 and SDGs, as Mozambique does, can help drive the prioritisation and alignment of R&I policies by capitalising on the global development agenda.
- Coordinated Operationalisation - Improving the alignment of R&D agendas with national development plans, as Zambia is pursuing, enables the coordinated implementation of policies.
- Cameroon - given the rich agricultural resources in Cameroon, the government can prioritise R&I in the agricultural sector. They can establish agricultural research institutes or centres of excellence to focus on crop improvement, soil management, and sustainable farming practices. By supporting research that addresses local agricultural challenges, such as drought-resistant crops or pest control, Cameroon can demonstrate the direct benefits of R&I to the agriculture-dependent population, thereby strengthening political will.
- Tanzania - with its diverse natural resources, Tanzania can leverage R&I to promote sustainable development and environmental conservation. The government can establish research centres focused on renewable energy, wildlife conservation, and eco-tourism. By investing in R&I initiatives that address environmental challenges and offer sustainable solutions, Tanzania can demonstrate the importance of R&I in preserving their unique ecosystems, attracting international attention, and fostering political will for further support.

7.5 CASE STUDIES ON PRIORITISATION

Mauritius recognised the importance of R&I as a driver of sustainable growth and has implemented a comprehensive set of policies and strategies to support its prioritisation and alignment. One key initiative is the National Innovation Framework, (**Figure 6**) which provides a roadmap for the development and coordination of innovation activities across sectors.

Figure 6 **National Innovation Framework**



Source: Mauritius Ministry of Technology, Communication, and Innovation, 2018

Mauritius' success in prioritising and aligning R&I policies can serve as a valuable lesson for other ACP countries. It underscores the significance of having a clear national vision, establishing dedicated institutions, promoting collaboration, and fostering entrepreneurship. By adapting and implementing similar approaches, ACP countries can harness the potential of R&I and STI to drive sustainable development and economic diversification.

Kenya's Vision 2030 - Kenya has a long-term development plan called Vision 2030, which includes a strong focus on research and innovation. The plan aims to transform Kenya into a newly industrialising, middle-income country by 2030. It emphasises the importance of R&I in driving economic growth and sustainable development.

Senegal's Emerging Senegal Plan - Senegal has formulated an Emerging Senegal Plan that outlines its vision for becoming an emerging economy by 2035. The plan recognises the importance of R&I in driving economic transformation and competitiveness. To support R&I prioritisation, Senegal has established technology parks and incubators that provide a supportive ecosystem for start-ups and innovators.

7.6 RECOMMENDATIONS

Based on an analysis of the main issues, interventions, opportunities for transformation, and the case study, the following recommendations are proposed to enhance the prioritisation and alignment of R&I policies in ACP countries:

Strategic Alignment with National Development Goals

- **Harmonise with national strategies:** align R&I priorities with countries' national development plans or equivalent overarching strategy. Ensure a seamless integration where R&I objectives complement and contribute to broader socioeconomic goals. Explicitly reference the national development strategy as a guiding framework for shaping R&D priorities, ensuring consistency and synergy.
- **Realism and achievability:** emphasise setting realistic and achievable R&I goals within the policy period. Prioritise objectives that are not only practical but also possess the potential for significant and tangible impact.

Inclusive Decision-Making

- **Stakeholder engagement:** engage in a consultative process involving major stakeholders, including traditional leaders, academia, industry, and civil society. Recognise the importance of diverse perspectives in setting R&I priorities.
- **Involving key ministries in policy development and decision-making** is crucial. Elevating the status of STI by designating it as a focal point for the Ministry of Finance, Planning, or the ministry responsible for industry is paramount. This ensures that financial considerations align harmoniously with national R&I goals.

- **Scientific community engagement**: establish mechanisms to actively engage scientific communities in the R&I policy-making process, fostering collaboration and harnessing expertise. Leverage the knowledge and expertise of scientific communities to inform decision-making and ensure that R&I priorities align with cutting-edge advancements in relevant fields.
- **Data-driven prioritisation:** advocate for a scientific, data-driven approach to prioritisation for informed decision-making.

Developing a Clear National Vision

- **Visionary leadership:** Advocate for strong and visionary leadership to establish a clear national vision for R&I. Political commitment is indispensable for fostering an environment conducive to innovation.
- **Identification of national priorities:** Define specific sectors and areas where R&I can exert the most significant impact on the country's development. Consider critical sectors such as energy, healthcare, education, and agriculture, aligning these priorities with overarching national development goals.
- Connect STI to national development goals: Integrate STI explicitly with national development goals, ensuring a strategic synergy between R&I activities and broader development objectives.

Establishing Dedicated Institutions

- **National innovation framework:** Formulate a comprehensive framework or strategy that outlines the country's approach to innovation. This framework should provide guidance on R&I activities across various sectors and facilitate their alignment with priorities.
- **Specialised agencies:** Create dedicated agencies or ministries responsible for overseeing and coordinating R&I efforts. These agencies can play a crucial role in implementing policies and programmes.

8 Governance of R&I Policies for Transformation

A consistent finding from scholarly publications, alongside policy and project reports, is the weakness in coordination of NSI stakeholders and the importance of strengthening R&I linkages in developing countries, to which many ACP countries belong. An effective governance framework is also essential for ensuring alignment between STI policies and related policies (such as industrial and ICT policies), national development plans (NDPs) and national Visions 2030[45]. Against this backdrop, this chapter examines issues of governance and the extent to which improvements in governance may help improve implementation, foster coordination, strengthen interactions, linkages, collaboration, cooperation, and partnerships between R&I actors and stakeholders in ACP countries.

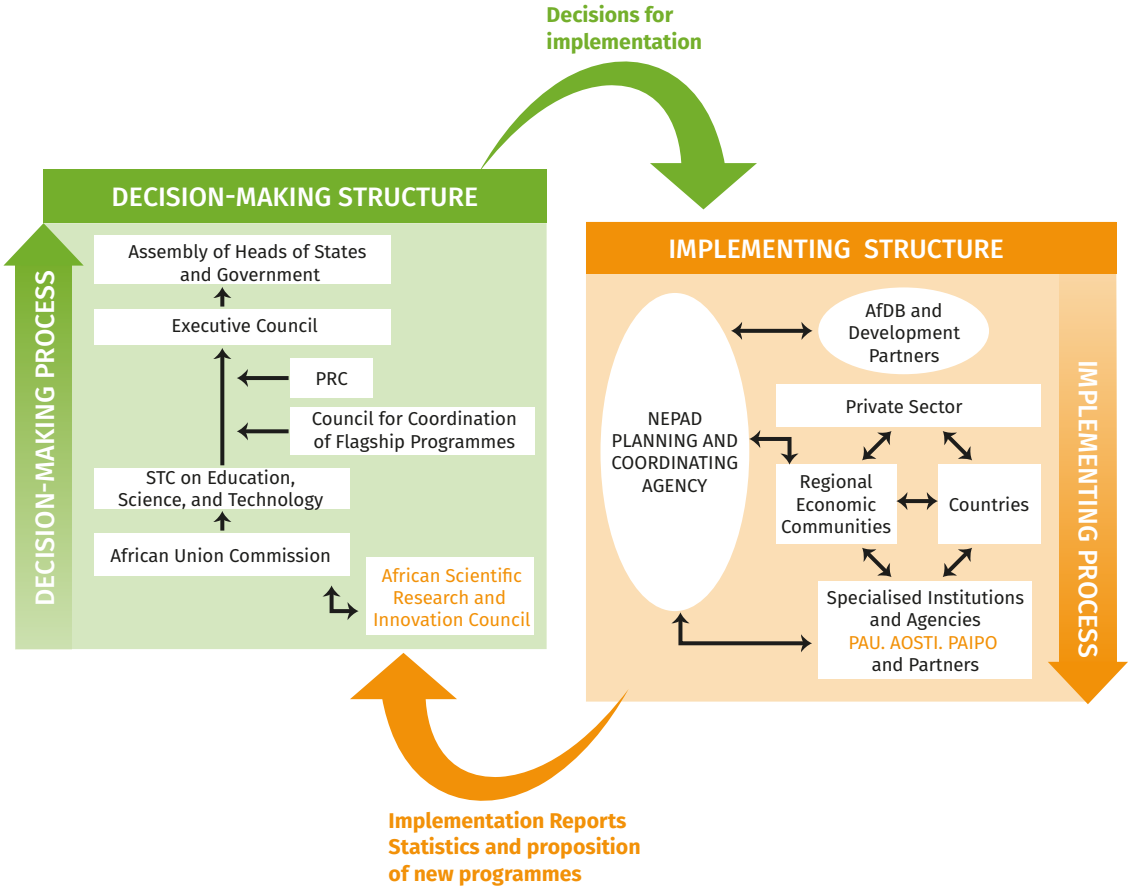
8.1 OVERVIEW

Governance is important for the formulation of public policies but even more important in achieving effective implementation. Governance helps to ensure adequate coordination of institutions, actors and stakeholders involved in implementation. In addition, governance can help address the persistent weak levels of interactions among NSI actors (Twiringiyimana et al, 2021) and ensure inclusion of a broader group of actors and stakeholders (Daniels et al, 2017). Inclusiveness is essential in reconceptualising STI or developing appropriate governance frameworks (Daniels, 2017). Furthermore, governance is vital to optimising the gains from STI and effective deployment of resources (AAS, 2018).

The African Union Commission in STISA-2024 notes that "the successful implementation of this [STISA-2024] STI policy primarily depends on the suitability of the chosen institutional arrangement, the capacities and complementarities of the institutions involved (AUC, 2015, p.32)." To this end, STISA-2024 presents a governance framework that spells out the institutional architecture for the implementation of STISA-2024 (**Figure 7**). This is an example of a governance framework that should be in place at continental, regional, and national levels in ACP countries, to support and guide the formulation and implementation of STI policies.

45 For example, Namibia has an Industrial Policy, National Development Plans (NDPs) with four pillars, and Vision 2030; Kenya has Vision 2030; while Lesotho and The Gambia also operate NDPs, see: https://www.gov.ls/wp-content/uploads/2021/06/National-Strategic-Development-Plan-II-2018-19-2022-23.pdf and https://smartdatafinance.org/storage/2021-09-27/JV7uAiUg3HzUjKu.pdf respectively. A more effective contribution from STI to national development requires adequate alignments with these policies, strategies, and visions.

Figure 7 **Institutional Architecture for implementation of STISA-2024**



Source: (AUC, 2014)

A robust governance framework supports decision-making, guides the actions of actors and stakeholders, outlines the roles and responsibilities of actors, alongside coordination, cooperation, and reporting mechanisms; and provides the basis for monitoring, evaluation, and learning. Using the MLE case study countries as a representative sample size for ACP countries, the evidence shows three categories:

i countries with R&I policies and corresponding R&I governance frameworks to support and guide the implementation and MEL (e.g., Ethiopia and Mozambique);

ii countries with R&I policies but without corresponding R&I governance frameworks to support and guide the implementation and MEL; and lastly,

iii countries without R&I policies and therefore without corresponding governance frameworks. In this instance, implementation of R&I programmes and projects is guided by broader governance structures such as those operationalised by the relevant ministries (e.g., Mauritius).

Although most participating countries have formulated an explicit R&I policy and are at varying states of implementation,

some of the countries currently still do not have a governance framework explicitly articulated in the STI policies. This lack of governance framework partly explains why – despite the progress in R&I policy formulation – implementation remains weak, or in some countries, non-existent. This gap also contributes to coordination and fragmentation challenges, which often manifest as weak interactions and linkages among actors, poor engagements in policy processes, a silo mentality and approach to programme delivery, less than optimum outputs and impacts from R&I policy. In R&I policies where a governance framework does exist, paucity of data and evidence make it difficult to determine to what extent the implementation of the governance has been effective in supporting the NSI and the realisation of the R&I policies' objectives and development targets. In the case of Ethiopia, for example, the governance "is in its formative stage" (UNCTAD, 2020, p.13), which calls for the country to design "a governance system that matches the new vision and aspirations, and the demands of innovation-driven industrialisation in the twenty-first century" (UNCTAD, 2020, p.14) and that involves a close working partnership between government and the private sector.

8.2 MAIN CHALLENGES AND WHY THEY HAVE PERSISTED

Despite the mounting evidence on the importance of governance in R&I policy-making – formulation, implementation, and MEL – several challenges remain in this this domain in ACP countries. These challenges range from practical considerations (such as fragmentation, a silo approach to policy-making, and the need for improved coordination of actors and stakeholders) to more theoretical aspects such as a weak understanding of the relevant theoretical frameworks (e.g., the NSI) that underpin R&I policy-making, poor familiarity with the policy cycle and policy processes, and gaps in the articulation of the evidence needed to inform policy-making. In addition, effective governance is needed to ensure that appropriate legal and institutional frameworks are in place to support policy-making, especially, implementation. Furthermore, to reiterate, an essential role for governance is in the coordination of actors and stakeholders from multiple public and private entities, sectors, and levels – in ways that ensure that appropriate incentives, commitments, and resources are in place to support R&I policies. Lastly, effective governance can help foster policy coherence, improve inclusiveness of actors and stakeholders, reduce the persistent gaps in funding, enhance prospects for more effective policy implementation and development impacts, and realise the SDGs, alongside national and continental priorities.

The empirical evidence gathered via desktop research and expert interviews from participating countries point to significant challenges in governance. In exploring the extent to which governance is successful and how issues of collaboration, coordination, and cooperation/partnerships are dealt with, evidence from **Cameroon** reveals that there is:

> a lack of coordination and collaboration between research institutes - for example, there is a lack of collaboration on the theme of climate change; competition between the Ministries of Research and Higher Edu-

> cation; a lack of synergy and of cooperation between the different research sectors' activities; and corruption and embezzlement (source: interview)

In the case of The **Gambia**, it is expected that improvements in governance will help to address the:

> lack of proper policy coherence and articulation and significant disjoints between national aspirations and policy goals. The aforementioned improvements will also promote investments in research, tackle the relegation of innovation to secondary status, and fix the political detachment in current policies that diverts attention from issues of direct developmental relevance ('office politics'). They will also ensure that R&I is a government priority and integrated in the national development plan, support the building of capacity for decision-makers, and deal with the misalignment of R&I among sectors (source: The **Gambia** interview data).

Meanwhile, in investigating what governance framework is in place and to what extent it is successful – for example in dealing with issues of collaboration, coordination, and other cooperation partnerships – the interviewee responded that it is only the ministry, not really governance, *[R&I policy is]* overseen by an STI committee set up in 2020. The result is weak coordination mechanisms with other relevant stakeholders (source: The Gambia interview data).

In the case of **Lesotho**, R&I policy governance is "mainly through the central government and line ministries" (interview data), while in **Mauritius**, although there is a ministry dedicated to R&I, the MRIC plays an active role as an adviser to the government on S&T and fosters collaboration among actors. The MRIC also helps convene NSI actors, as it is considered to be an honest broker, not a threat" (interview data). With respect to Namibia, "there is a formal R&I policy that is currently being implemented using specific policy instruments and focusing on selected sectors. The implementation is progressing well on specific national development and SDG issues, such as gender and women empowerment, and support for makers' spaces. However, the challenge remains in supporting grassroots actors" (interview data). This highlights the importance of governance frameworks that foster inclusivity.

The preceding discussions and evidence from case countries show that the ACP region continues to face significant governance challenges, which hinder policy-making, especially implementation. The next section provides a short summary of some of the interventions being operationalised in ACP countries to help address the gaps in R&I policy governance.

8.3 POLICY TOOLS AND INSTRUMENTS: MAIN INTERVENTIONS, OPERATIONALISATION, AND IMPACTS

Some of the main challenges and insights on why these challenges have persisted over the years have been outlined above in **Section 8.2**. This section examines some of the interventions that have attempted to address the governance challenges and improve policy-making in ACP countries. A summary of typical policy instruments and tools that are being deployed to address the challenges are summarised in **Table 11**. As the table shows, some issues covered in the preceding chapters also feature here – such as funding and capacity, as they are cross-cutting. With respect to funding, for example, the interviewee from Togo noted that "R&I is difficult to govern when sectoral research centres are under other ministries (which fund their programmes themselves)". This helps to explain how an infective approach to funding exacerbates the challenge of silo work, fragmentation, and governance.

Table 11 - Summary of typical policy instruments and tools deployed to address gaps in policy governance.

Policy instruments and tools	How operationalised and objective	Example and where operationalised
Institutional strengthening	Changes, for example, in the structure, configurations, status, or name of ministries of S&T, agencies and departments. Objective: to improve coordination, reduce fragmentation, and emphasise innovation.	Change in name of Ministry of Education, S&T to Ministry of Technology and Innovation (Ethiopia, Zambia, Guinea). Another example is the merging of education and S&T/STI ministries or departments.
Education, training, and capacity building	Education, training, and capacity building on R&I policy-related topics, governance, management (data, policy, technology), etc. Objective: to improve awareness on R&I policies and policy-making, governance, and underpinning theories and frameworks.	All case countries in this Handbook are involved in one form of education, training, or capacity building on R&I policy-related topics and subject areas.
Development of legal framework and policy frameworks	Development and implementation of governance frameworks, strategies, or plans. Objectives: Rules and responsibilities are clear and well defined for each stakeholder.	Except for a few countries, as pointed out in **Chapter 2**, the rest of the countries in this Handbook have developed an R&I policy framework.
Improving the funding landscape and resources for implementation	Funding of R&I initiatives that involve joint actors. Objective: foster collaboration, improve ease of coordination, reduce fragmentation and duplication, enhance R&I.	Implementation of several funding instruments, some of which require joint application and delivery by actors from different sectors e.g., academia and industry (Mauritius)
Inclusion of wider stakeholder groups in STI policy governance structure	Consultation, stakeholder engagement and improvements in communication. Objective: address the low levels of inclusiveness and stakeholder participation in R&I policies.	Progress is being made in including a wider number of stakeholder groups in R&I policy but less so in the governance structure.

Table 11 - Summary of typical policy instruments and tools deployed to address gaps in policy governance.

Policy instruments and tools	How operationalised and objective	Example and where operationalised
International partnerships in R&I and STI (policy)	Involvement in international partnerships, collaboration, and mutual learning exercises in R&I (policy). Objective: exchange of knowledge and expertise, and learning.	Every country in this Handbook is involved in one or more international partnerships in R&I and STI (policy). However, there is room for improvement on the quality, sustainability, outcome and impacts of the partnerships on development.
STI Policy Reviews	Revision of national R&I ecosystems and policies. Objective: help to unpack gaps in coordination and governance, and mainstream innovation	For example, countries like Zambia and Ethiopia have conducted STI policy reviews, with support from UNCTAD .
Creating effective communication mechanisms	Set up a dedicated communication strategy, at the level of STI division or department, to handle the communication channel(s) with national press and implement its own social media tools. Objective: to address the low level of appreciation of STI across all spectra of society.	Case in point, Seychelles.

Source: (AUC, 2014)

As **Table 11** above shows, several interventions have been put in place to help address the governance challenges in ACP countries. Nevertheless, as the interview evidence reveals, many gaps remain. This indicates that these interventions are at best inadequate, hence the persistence of the challenges and the need for ideas articulated in this Handbook. If addressed, effective governance of R&I policies will enhance transformation efforts and development impacts, as discussed in the next section.

8.4 OPPORTUNITIES FOR TRANSFORMATIVE CHANGE

Progress in governance can help ensure that R&I policies support development aspirations in the ACP region. To this end, selected areas of opportunity for improvements in the governance of R&I and STI policies to transform societies, structures and systems in ACP countries are presented below.

a. Improved governance will enhance R&I policy implementation success and help to better exploit opportunities from the R&I ecosystem. Having policies in place is important and useful. However, implementation is vital. For implementation to succeed and foster increased gains from R&I (opportunities for transformation), institutions and key stakeholders that are well coordinated and governed are critical.

b. Evidence from Seychelles states that "experience has proven that it does not solely depend on well-crafted evidence-based policy that leads to a successful implementation of the same. Other factors play key roles, such as the right institutional and legal framework, which, in the case of Seychelles has been severely disrupted with the restructuring of the former NISTI" (source: interview data). This highlights the importance of institutions that are well structured alongside legal frameworks, all of which must be in place to enable effective implementation. Governance that supports better coordination among NSI actors, improves linkages and reduces fragmentation will be critically important in this regard to ensure that Seychelles leverages the opportunities for transformation from the country's R&I ecosystem.

c. Evidence from Guinea reveals "weak organization of the national R&I system; weak resources (human, financial, and material); and limited openness of the system to the international community" (source: interview data). Improvements in the governance of the NSI can help to address these weaknesses and reap the opportunities that result afterwards.

d. Another area of opportunity for transformation lies in the more effective use of the existing R&I infrastructure and NSI ecosystem. This holds ample potential for transformative change that covers social, economic, and environmental dimensions. As further evidence from Guinea reveals:

> many research structures exist with different profiles and status but whose impact on national development remains marginal.

In addition,

> STI is gradually being introduced into the vision of Guinea's national institutions and enterprises. There is brand innovation among entrepreneurs, but not in an institutional way (some Fab-Labs and a tech hub in innovation), along with an innovative programme: student entrepreneur status by decree with the support of the AUF (addition of innovation in 2021 and change of name of the ministry) (source: interview data).

These gaps in Guinea hinder the country's opportunities for transformative change through R&I. A more effective governance can help address these gaps.

e. Strengthening the research ecosystem in ways that more effectively support the domestic innovation and development agenda. Evidence from Seychelles reveals that currently "a lot of research is being done, but with foreigners" (source: interview data). As mounting evidence has already shown, research directed/led, conducted, and funded by foreigners or international donors in Africa focuses less on the national priorities of the host countries.

8.5 CASE STUDIES ON GOVERNANCE PRACTICES

This section examines the presence of an STI policy governance framework in the case countries, as a sample in ACP regions, and to what extent the governance frameworks have been successful, where they exist. As discussed in the preceding sections, governance is vital for dealing with issues of collaboration, coordination, cooperation and partnerships. The governance structure of four countries is presented below.

Lesotho: The evidence gathered reveals that governance is vital for securing political buy-in, ensuring that policies are backed by supporting legal frameworks, and prioritising the integration of an effective system for the implementation, monitoring, and evaluation of national R&I policies.

Tanzania: STI policy governance rests with the Commission for Science and Technology (COSTECH), which is under the Ministry of Education, Science and Technology (MoEST) of the Mainland Republic of Tanzania (not including Zanzibar). MoEST has an STI division and STI section[47]. However, the STI division, is one of the six divisions at the ministry, which creates competition for resources and attention and potentially reduces visibility (see **Annex 3**). In Zanzibar, an equivalent ministry exists – the Ministry of Education and Vocational Training (MoEVT)[48], MoEVT does not have an STI department, instead it has an ICT department. The interview respondent noted there is "no link between COSTECH in mainland Tanzania and the ICT department in Zanzibar", arguing that "this structure needs to be improved in order to strengthen governance". For example, the State University of Zanzibar engages with youths and students. However, there is no central coordinating organ on innovation. One implication of this gap is that, often, the ministry is unaware of what academia is doing. Effective governance could help address this gap, foster communication and knowledge exchange and enhance innovation for transformative change.

Zambia: The previously adopted governance structure meant that "S&T was 'hidden' under the Ministry of Education. There's now more emphasis on technology alongside major efforts to reduce silos and 'frontloading of STI'" (source: interview data). Following the review of the STI ecosystem and STI policy (see UNCTAD, 2022), there are now plans to restructure the National Council on Science and Technology (NCST) to help further improve governance, with a focus on enhancing coordination and management of funds. Among other objectives, this restructuring will help to improve the collation of research funds from other ministries e.g., Ministry of Agriculture, deposit the funds under the National Research Funds and improve implementation, data collection and reporting (based on specific indicators), and a MEL framework.

Seychelles: In the case of Seychelles, the governance framework in place consists of a high-level STI steering committee led by the vice president, consisting of an industry committee with representation from the Ministry of Investment, Entrepreneurship, and Industry (MIEI), a public university, 10 technical vocational education and training (TVET) centres, non-governmental organisations (NGOs), key national research organisations

47 https://www.moe.go.tz/en/structure

48 https://moez.go.tz/index.php

and several agencies and authorities. Together these NSI actors and stakeholders interact in ways that help to ensure linkage and effective STI governance.

Namibia: The NCRST, under the Government of Namibia's Ministry of Education, Training, and Innovation (MoETI) (see **Annex 4**) has a good working relationship with the ministry. This relationship enables a more effective governance that fosters collaboration, coordination, and cooperation among Namibia's NSI. "We are really one team. For example, during policy development, the Director at the Ministry sits with the Council. Even the National Planning Commission. The NCRST has an excellent relationship with the government and private sector actors" (source: interview).

8.6 RECOMMENDATIONS

- Ensure that every country has an explicit governance framework, strategy, or plan in place – either embedded in the policy formulation document or implementation framework or developed as a standalone document. Effective governance, if realised, will help in further developing the NSI, foster collaborative relationships among industry, university, and the government, which is essential for innovation; and enhance R&D.
- Strengthen the capacity of policy-makers, decision-makers, and high-level STI actors on governance issues to help improve the coordination of STI activities across sectors, reduce incoherence and misalignment among sectors and enhance collaboration. This recommendation responds to the need for more STI literacy for politicians, as expressed by case study countries.
- Improve learning on governance approaches for example by joining regional[49] and international R&I and STI policy networks and partnerships where co-creation and mutual learning is the norm. Deepen South-South cooperation in R&I and STI policy, where they already exist.
- Deepen the involvement of parliamentary S&T committees and presidential advisers on STI in countries where they exist and create these positions in countries where they currently do not exist. Inclusion of these actors in the governance frameworks could help increase the respective government's commitment on STI issues.

49 For example, the Transformative Innovation Africa Hub (TIAH), based at the Future Africa Campus, University of Pretoria, South Africa. Another example is the UNDP Innovation Lab, which operates in several countries in Africa.

9 Politics and Power in R&I Policy-making

In the context of R&I policies, politics and power dynamics significantly shape the decision-making processes and outcomes in ACP countries. The involvement and commitment of government actors, including policy-makers and political leaders, play a crucial role in formulating, implementing, monitoring, and evaluating R&I policies. However, it is essential to recognise that politics can sometimes lead to short-term strategies and policies driven by immediate political interests. In such cases, the focus may shift towards quick wins and visible results, potentially overlooking the long-term transformative potential of R&I. This chapter provides an overview of the role of politics and power in policy-making, focusing on the influence of political commitments, support mechanisms, and governance structures in fostering transformative outcomes and desired development impacts through R&I.

9.1 OVERVIEW

In ACP countries, R&I policies play a pivotal role in shaping the development landscape. Ensuring that these policies align with national goals is crucial. ACP nations face challenges such as limited resources, competing priorities, and sometimes political instability, which can impede effective R&I policy implementation. The key to overcoming these hurdles lies in strong political commitment, clear prioritisation frameworks, and public involvement.

ACP countries have shown promising political will to drive R&I policies and power in policy-making. Many nations have articulated strong support for R&I, making it a priority on their political agendas. However, the translation of these policies and commitments into tangible actions has proven challenging in some instances. There often exists a disparity between articulated intentions and concrete actions, influenced by factors such as resource constraints, competing priorities, and insufficient coordination between government entities. Bridging this gap is imperative for ACP countries, ensuring that their commitments materialise into effective R&I strategies. Recognising that good intentions alone may not catalyse the transformative changes required for innovation-driven progress, concerted efforts are needed to align rhetoric with impactful actions.

9.2 MAIN CHALLENGES AND WHY THEY HAVE PERSISTED

In ACP countries, one of the primary challenges faced in the domain of R&I policies is the lack of political will and commitment to prioritise them. Political leaders may not perceive R&I as a top priority, resulting in insufficient support and inadequate resource allocation. This lack of political will has the potential to hinder the development of vibrant R&I ecosystems and limit the transformative power of R&I policies. Recognising the critical role that political leaders and policy-makers play in driving effective R&I policies, it becomes im-

perative to highlight the importance of their commitment and involvement in shaping the future of R&I.

Despite the strong political will to promote R&I within governments, its practical implementation often encounters obstacles. This section aims to delve into the complexities and challenges faced by some countries in translating their R&I ambitions into tangible actions and outcomes.

Power Dynamics and Interests

- Power dynamics and vested interests can influence R&I policy-making, potentially leading to policies that serve specific groups rather than the broader public interest. Especially considering that political cycles often operate on short-term timelines, and the long-term nature of R&I efforts may not align with immediate political priorities. Policy-makers may be more inclined to pursue initiatives with quick and visible outcomes that can be showcased within the limited timeframe of their tenure. Addressing entrenched power dynamics requires a fundamental shift in governance structures, which can be resistant to change.

- Public understanding and awareness of the significance of R&I may be limited, impacting the level of political support for comprehensive policies. Building public awareness requires sustained efforts in education and communication, which may not always be prioritised in political agendas.

Misalignment between Policy and Implementation

- Political agendas often encompass a myriad of priorities, and R&I may not always occupy a central position in policy-making. This discrepancy is due to several factors, including limited resources, competing priorities, bureaucratic hurdles, and a lack of coordination among government entities. The bureaucratic machinery can also impede the agility required for swift and effective policy-making in the dynamic R&I landscape. These challenges collectively hinder the seamless translation of policy intent into effective implementation.

- This issue is exemplified in countries like Mozambique and Guinea, where despite expressing robust support for the implementation of R&I policies, a misalignment exists between the official stance and the actions taken.

Political Instability or Crises

- During periods of political instability or crises, governments often face challenges in prioritising R&I as more immediate concerns and the need for resource reallocation take precedence. In such situations, the political will to support R&I may be overshadowed by the urgency of addressing the crisis or maintaining stability.

- Ethiopia serves as an illustrative example of how political instability and crises can significantly disrupt R&I efforts. The focus on R&I in Ethiopia has been adversely affected by political differences and the distraction caused by an ongoing conflict in the northern region. This conflict has also resulted in the destruction of start-ups, setbacks in digitalisation efforts, and the disruption of vital connections, diverting attention and resources away from crucial R&I initiatives.

9.3 POLICY TOOLS AND INSTRUMENTS: MAIN INTERVENTIONS, OPERATIONALISATION, AND IMPACTS

Political will is crucial for the successful implementation of R&I policies, as it provides the necessary support and resources to drive innovation, research, and technological advancements. By recognising the importance of R&I and aligning it with national priorities, governments can harness the potential of science and technology to address pressing challenges and drive sustainable development.

In the pursuit of R&I excellence, ACP countries face intricate political landscapes and power dynamics that can significantly shape the effectiveness and outcomes of their R&I policies. To navigate these complexities and ensure optimal governance and decision-making, the utilisation of tools and frameworks specifically tailored to R&I politics becomes imperative (see table below).

Table 12 - Summary of typical policy instruments and tools deployed to address gaps in politics and power

Challenges	Policy Instruments, Tools, and Approaches	Operationalisation
Power dynamics and interests	Open consultation and inclusive decision-making	Promote open consultation and inclusive decision-making processes by actively involving a diverse range of stakeholders, including representatives from academia, industry, civil society, and marginalised communities. Establishing platforms for collective input ensures a more democratic and balanced policy-making approach.
	Independent advisory committees	Power dynamics and vested interests can influence R&I policy-making, potentially leading to policies that serve specific groups rather than the broader public interest. Establishing independent advisory committees comprised of diverse experts from academia, industry, and civil society can mitigate undue influence. These committees ensure a balanced representation of interests, fostering transparency and accountability in the policy-making process. Norway's Research Council, for instance, incorporates such committees to provide expert advice free from vested interests, enhancing the integrity of R&I policies.
	Public engagement campaigns	Implementing public engagement campaigns, using various media channels and community events, can effectively educate and inform the public about the importance of R&I. Limited public understanding and awareness of the significance of R&I impact political support for comprehensive policies. Building awareness requires sustained efforts in education and communication, which may not always be prioritised in political agendas.
	Public accountability platforms	Develop online platforms or portals for public accountability, where citizens can access information about R&I policies, funding allocations, and decision-making processes. Increased transparency enables public scrutiny and holds policy-makers accountable.

Table 12 - Summary of typical policy instruments and tools deployed to address gaps in politics and power		
Challenges	**Policy Instruments, Tools, and Approaches**	**Operationalisation**
Misalignment between policy and implementation	Institutional strengthening	Implement institutional strengthening programmes targeted at enhancing the capabilities of relevant institutions involved in R&I policy formulation and implementation. This may involve upgrading infrastructure, providing training, and ensuring that institutions have the necessary human and technical resources.
	Smart specialisation	Identify key sectors that have significant potential for growth and impact and demonstrate how R&I can address pressing societal issues and contribute to economic development.
	Advocacy	Engage with parliamentary committees on R&I to actively involve key decision-makers in policy processes related to R&I.
	Implementation roadmaps	Develop detailed implementation roadmaps that outline specific steps, timelines, responsible entities, and performance indicators for each aspect of the policy. These roadmaps provide a clear and structured plan, reducing ambiguity and enhancing accountability.
	Education, training, and capacity building	Education, training, and capacity building on R&I policy-related topics, governance, management (data, policy, technology), etc.
	Establishing R&I coordinating bodies	Form dedicated bodies or committees responsible for coordinating R&I efforts across different government entities. These coordinating bodies can bridge gaps, enhance communication, and streamline efforts to ensure a cohesive approach to R&I policy-making.
	Interdepartmental coordination mechanisms	Institute mechanisms for interdepartmental coordination to facilitate seamless collaboration among different government agencies involved in policy implementation. Clear lines of communication and cooperation can prevent miscommunication and enhance the overall effectiveness of the policy.
	Performance-based budgeting	Implement performance-based budgeting mechanisms where government entities are required to justify budget allocations based on the impact on R&I outcomes. This encourages responsible resource allocation and emphasises the importance of R&I within overall budget considerations.
	Streamlined administrative procedures	Simplify bureaucratic processes related to R&I initiatives to minimise administrative hurdles. Streamlining procedures can expedite the implementation of R&I policies, making them more attractive and feasible for decision-makers.

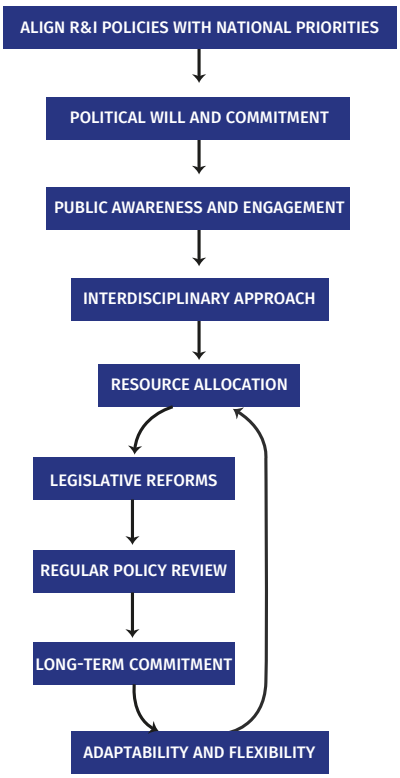
Table 12 - Summary of typical policy instruments and tools deployed to address gaps in politics and power		
Challenges	**Policy Instruments, Tools, and Approaches**	**Operationalisation**
Political Instability or Crises	R&I emergency and flexible funding mechanisms	Create emergency funding mechanisms dedicated to R&I activities during times of crisis. Adopt flexible funding models that allow for quick adjustments to R&I priorities based on emerging needs during times of political instability.
	R&I diplomacy	Engage in R&I diplomacy initiatives to foster international collaboration during crises. Collaborating with global partners can provide access to shared resources, expertise, and collaborative efforts to address common challenges.
	Rapid response R&I task forces	Establish rapid response R&I task forces capable of quickly mobilising resources and expertise to address emerging challenges.
	Crisis-driven public-private partnerships	Foster crisis-driven public-private partnerships that enable collaboration between government and industry to address R&I priorities during political instability. These partnerships can facilitate resource-sharing, joint initiatives, and technology transfer.

Source: Authors.

The blueprint illustrated in **Figure 8** can serve as a guiding framework for ACP countries to effectively harness the potential of R&I policy-making. This strategic approach empowers them to adeptly address pressing challenges, foster sustainable development, and enhance the well-being of their citizens.

- Align R&I policies with national priorities - Ensure that R&I policies and initiatives are closely aligned with the country's top-priority sectors and pressing societal challenges.
- Political will and commitment - Garner strong political will and commitment to R&I by highlighting its relevance to critical areas like job creation, healthcare, agriculture, and economic development.
- Public awareness and engagement - Raise public awareness about the importance of R&I in addressing national challenges and

Figure 8 Guiding framework for ACP countries to align politics with R&I policy formulation



Source: Authors

improving quality of life. Encourage public participation and engagement in R&I policy-making and implementation.

- Interdisciplinary approach - Promote cross-sector collaboration and interdisciplinary approaches to R&I, breaking down silos and encouraging innovation.
- Resource allocation - Allocate resources, including funding and infrastructure, to support R&I initiatives that address national development objectives.
- Legislative reforms - Review and update relevant legislation related to R&I, ensuring it supports innovation and addresses emerging challenges.
- Regular policy review - Periodically review and update R&I policies to stay aligned with evolving national priorities and changing global trends.
- Long-term commitment - Understand that building R&I capacity is a long-term endeavour. Maintain consistency in funding and policy support for sustained growth.
- Adaptability and flexibility - Stay adaptable to changing global trends and emerging technologies.

The above, in conjunction with regular policy reviews and a monitoring, evaluation and learning process, will facilitate positive social and economic gain.

9.4 OPPORTUNITIES FOR TRANSFORMATIVE CHANGE

ACP countries increasingly recognise the pivotal role of R&I in fostering economic development, improving public well-being, and enhancing their global competitiveness. Political commitment to R&I policies, combined with innovative strategies and targeted investments, holds the potential to drive transformative change. This section delves into the approaches and political will of select ACP countries as opportunities for transformative change through the harnessing of R&I. By shedding light on their potential, it underscores the capacity of these countries to spearhead forward-looking and transformative policies, leveraging the power of R&I for substantial and positive impact.

Countries have significant opportunities for transformation in strengthening their governments' R&I political will. For instance, countries such as Zambia, Ethiopia, and Tanzania have the potential to leverage these opportunities effectively. The key lies in harnessing these prospects in alignment with their unique local contexts and ecosystems, thereby fostering substantial progress in R&I endeavours.

Ethiopia's leadership has the potential to navigate through political differences and crises-induced distractions to revitalise its STI sector. By prioritising STI, revitalising start-ups and digitalisation efforts, and strengthening political commitment, the country can significantly enhance innovation and pave the way for sustainable development.

Zambia's pronounced political commitment, notably exemplified by the advent of a 'new dawn government,' lays a solid groundwork for prioritising R&I. The synchronisation of the R&I policy with the new National Development Plan and Vision 2030 underscores a resolute dedication to fostering innovation and propelling economic growth. A strategic approach involving periodic policy reviews and realignment, coupled with the integration of

technology across diverse sectors, puts Zambia in a position to strengthen its steadfast commitment to innovation. The interview data also highlights efforts made to engage more with the Parliamentary Committee on Science and Technology, demonstrating a willingness to involve key decision-makers in policy processes related to R&I. Additionally, conducting capacity-building initiatives for parliamentarians on the concept of R&I is a positive step toward enhancing their knowledge and enabling them to contribute effectively to R&I policy-making, pushing R&I to the top of the political agenda. These actions demonstrate an active effort to bridge the gap between political will and practical implementation.

By identifying key sectors with significant potential for growth and impact, countries can showcase how R&I can address pressing societal issues and contribute to economic development. Engaging stakeholders from academia, industry, and the government in collaborative efforts can help build a shared vision and foster a supportive environment for R&I.

Furthermore, showcasing successful case studies and best practices from similar contexts can inspire policy-makers, demonstrating the tangible benefits of R&I and encouraging them to prioritise and invest in these areas. Ultimately, by tailoring approaches to their specific contexts and leveraging local resources, ACP countries can enhance their governments' R&I political will and drive sustainable development.

9.5 CASE STUDIES ON POLITICS AND POWER

Sharing success stories and lessons learned in R&I politics and power in policy-making offers valuable inspiration and guidance for other countries. It underscores the significance of political commitment and effective policy implementation, highlighting the transformative potential of these practices for a country's development. ACP countries with commendable policies provide invaluable examples that can foster cooperation and mutual support among nations as they work towards innovation-driven progress. This section will delve into the approaches of Senegal, Rwanda and Kenya in implementing their R&I policies.

Rwanda stands out for its commendable best practices in R&I policies. The government has made significant efforts to integrate R&I into its national development agenda. Leadership in Rwanda has established institutions such as the Rwanda Innovation Fund and the National Council for Science and Technology (NCST) to propel R&I initiatives. This proactive approach demonstrates political commitment to R&I, making Rwanda a notable example for other ACP countries.

Similarly, Senegal has been proactive in promoting R&I within its policy framework. The country's political leadership has exhibited commitment by establishing institutions like the National Agency for Scientific and Technical Research (ANSTS) and the National Research and Innovation Strategy. This strategy aims to position Senegal as an emerging country by 2035, driven by science, technology, and innovation. Senegal's efforts reflect a forward-looking approach that can serve as a model for other ACP countries.

In Kenya, the establishment of the Kenya National Innovation Agency (KeNIA) serves as an exemplary tool and instrument. It plays a

pivotal role in formulating and implementing the National Innovation Strategy, which guides the country's R&I policies and investments. KeNIA's responsibilities also include creating an enabling environment for innovation, fostering a culture of research and development, and promoting the commercialisation of innovative products and services. By working closely with various stakeholders, including government agencies, research institutions, and the private sector, KeNIA influences decision-making processes and outcomes in Kenya's innovation agenda. Its activities shape the allocation of resources, policy framework conditions, and support mechanisms for research and innovation in the country. In this way, KeNIA highlights the intersection of politics and power in the policy-making process and shows how it drives transformative outcomes in R&I.

Moreover, actively engaging political leaders, involving parliamentarians in advocating for legislative adjustments conducive to socio-economic advancement, and organising events that underscore the significance of innovation for development can foster support and cultivate a conducive atmosphere for R&I. By customising these strategies to align with their specific local contexts and ecosystems, other ACP countries can capitalise on opportunities, reinforce their government's commitment to R&I, and advance their socio-economic progress.

9.6 RECOMMENDATIONS

- **Leveraging local opportunities:** to strengthen governments' R&I political will in ACP countries, it is crucial to leverage opportunities based on their local realities and ecosystems. Countries can identify key sectors that have significant potential for growth and impact and demonstrate how R&I can address pressing societal issues and contribute to economic development.
- **Alignment of policies and actions:** ensure policies and commitments align with practical actions. Bridge the gap between political intentions and execution for the effective implementation of R&I policies.
- **Parliamentary involvement:** actively involve parliamentarians in the policy-making process. Provide them with necessary information, resources, and training on R&I to empower them to advocate for R&I issues at the legislative level.
- **Integrate R&I into national development agendas:** integrate R&I into national development agendas and strategic plans. Align R&I policies with broader development goals, including poverty reduction, job creation, and sustainable economic growth. Position R&I as a critical driver of development to mobilise political support and allocate resources accordingly.
- **Strengthen science advice mechanisms:** establish or strengthen science advice mechanisms, such as national science advisory councils or committees. These mechanisms can provide evidence-based advice to policy-makers, fostering a culture of evidence-based policy-making. Enhance the credibility of R&I policies and build trust among stakeholders through robust science advice.
- **Tailored science advisory structures:** establish science advisory structures

that are tailored to the specific needs of ACP countries. Ensure these structures incorporate diverse perspectives, including indigenous knowledge, and provide evidence-based advice to policy-makers, enhancing the credibility of R&I policies.

- **MEL framework:** conduct periodic evaluations of R&I policies to assess their alignment with public interest and to identify any potential biases or conflicts. Independent external evaluations contribute to accountability and help correct any deviations from the intended policy goals.

- **Inclusiveness:** embrace inclusive practices by adopting best practices in inclusivity, incorporating indigenous knowledge, adapting to digitalisation-induced changes, and promoting gender equality. These practices align with the 2030 SDGs and key principles such as ensuring access to quality education.

- **Advocacy strategies:** develop advocacy strategies that resonate with the political and cultural nuances of ACP countries. Engage in targeted advocacy efforts to communicate the socio-economic benefits of R&I, ensuring alignment with local priorities and demonstrating its potential for transformative change.

- **Adaptation of global good practices:** while embracing inclusivity and indigenous knowledge, adapt global best practices in R&I policy-making to suit the specific needs and challenges faced by ACP countries. Consider a phased approach, allowing for the gradual implementation of successful strategies that align with local realities.

10 Conclusion

This Handbook has provided the background and justification as to why ACP countries must focus on the formulation and implementation of more effective R&I policies and strategies as one means of tacking the multiple and complex development challenges that face the region. In doing this, the Handbook has covered key topical areas identified by the countries involved in the PSF Mutual Learning Exercise as fundamental to their ability to better exploit R&I for their socioeconomic development. The topics covered are policy formulation and implementation, funding, monitoring, evaluation, and learning (MEL), capacity and skills, inclusiveness, prioritisation, and alignment of R&I policies with other policies, governance, and lastly, politics and power relations in R&I policy-making. The central argument is that enhancing these aspects of the policy cycle is vital to ensuring that R&I policies contribute better to economic, social and environmental goals in ACP countries and beyond. The evidence presented in the Handbook is based on secondary data, workshops, and interviews with key R&I actors and stakeholders. From the insights gathered emerged key messages and overarching recommendations, which are presented below. Recommendations that are specific to each of the topics covered are presented under the relevant chapters above.

10.1 CONCLUDING REMARKS AND KEY MESSAGES

- All countries examined in this Handbook recognise and acknowledge the importance of research and innovation in their development, hence the need for R&I policies to help drive the relevant programmes, projects, and initiatives. In Seychelles, for example, the priority is to "embed science, technology, research and innovation into the socio-economic transformation to help spur knowledge-driven and value-added sustainable growth for improving the quality of life of its people". Other countries have similar ambitions and aspirations, which in sum, seek to harness research and innovation for development in ways that support the transition to knowledge-based economies in the ACP region.

- This heightened understanding and appreciation of the importance of R&I in development means that most countries currently possess R&I policies (or an equivalent in the form of STI policies). The presence of these policies is evidence of progress in R&I policy formulation. However, implementation, MEL, and governance of these policies remain areas with critical challenges that require urgent attention.

- The absence of governance frameworks, or weaknesses in governance where frameworks do exist, mean that opportunities for transformative change through research and innovation continue to be hampered by difficulties in collaboration and coordination, and poor accountability measures.

- In relation to this, an inability to co-create R&I policies with a broader stakeholder base, coupled with fragmentation in implementation, inadequate M&E, and the governance weakness outlined above, pose key challenges to harnessing the development impacts of R&I policies.

- To this end, it is essential that coordination and cooperation challenges and barriers to interactive learning among stakeholders be addressed, as these hinder R&I policies. These areas of concern require urgent attention by national innovation systems' (NSI) actors and stakeholders, working together in a participatory and co-creation mind-set to find inclusive and sustainable solutions that are long-term and focus on systems change.

- There is a deeper appreciation of the need to revisit the issue of capacity and funding for R&I in ACP countries and ensure greater involvement of private sector actors in the processes involved. This calls for increased investments in R&I by governments and private sector actors. This may be achieved by establishing or strengthening platforms that direct R&I towards growth enterprises, for example through enhancing infrastructure support for innovation and technology hubs in aspects such as prototyping tools.

- Finally, there is an increased tendency and renewed efforts towards implementing an inclusive approach to R&I policy formulation and recognising the need to embrace cultural, traditional, and indigenous knowledge systems to leverage better impacts from R&I solutions in community contexts. Achieving this must take into consideration the role of politics and power, and the agency of marginalised actors and stakeholder groups.

10.2 OVERARCHING RECOMMENDATIONS FOR ACP COUNTRIES

The recommendations in this category are designed to be operationalised by national government ministries, departments or agencies with a direct mandate and oversight of R&I policies (such as ministries of science, technology and innovation), in collaboration with relevant ministries and agencies such as ministries of planning, finance, trade or industry.

- Strengthen R&I policy formulation and implementation by ensuring that they are informed by national priorities and plans and involve broader stakeholder participation. For example, involving planning commissions in R&I policy formulation and implementation is key to ensuring effective budget provisions for targeted interventions. R&I interventions in policies and strategies must speak to national action plans and be aligned to long-term sustainable development goals and targets.

- Increase R&I funding and promote investment into R&I ventures by mobilising innovative financing and diverse funding instruments and portfolios, including venture capital and angel funding entities in efforts to improve financial inclusion of relevant and key players, and supporting R&I initiatives across the innovation chasm. Improvements in funding for implementation is necessary to achieve the intended purposes and impacts from R&I policies.

- Emphasise R&I policy implementation, monitoring and evaluation, and governance – i.e., place greater emphasis on other stages of the policy cycle that go beyond formulation (or design).
- In doing this, ensure that R&I policy MEL frameworks are informed by relevant and measurable indicators, and that evaluation results in transformative outcomes. These need to be co-created with the relevant stakeholders in the national system for innovation. Furthermore, review MEL frameworks, indicators, and tools regularly to ensure that they remain relevant as mechanisms used to inform policy.
- Build STI capacities and skills for funding and research in ways that cover both individual and institutional capacities and involve private sector actors in the process. Capacity strengthening efforts currently seem to overemphasise skills, with less attention paid to institutional capabilities.
- Design and conduct policy experiments, including demonstrations, with a view to uncovering innovative ways to increase stakeholder participation in the co-creation and co-implementation of R&I policies.
- Foster inclusiveness in R&I policy-making by developing targeted instruments e.g., gender inclusiveness mechanisms that help to bridge existing gaps, reduce inequality and improve equity in policy-making. In addition, onboard indigenous knowledge systems and embrace diverse cultural norms that create opportunities for marginalised and excluded groups.
- Prioritise and align R&I policies and strategies with other national plans. Where applicable, elevate R&I policies to the highest levels of national strategies, and leverage R&I frameworks and tools to advance the national strategies.
- Establish robust governance frameworks with clear reporting and accountability structures to advance R&I policies into mainstream economic activities. Furthermore, ensure that the governance frameworks are complemented by operational structures that support the implementation of R&I policies and strategies in line with national priorities.
    - Provide for strong political commitments that support R&I policy implementation and help achieve developmental impacts on society. There are many pronouncements of development aspirations through R&I, for example, targets that include desires to reach certain R&D targets as percentage of GDP. However, in practice these aspirations are not being realised due to a mismatch between these pronouncements and the necessary commitments.

10.3 OVERARCHING RECOMMENDATIONS FOR INTERNATIONAL DEVELOPMENT PARTNERS

The recommendations in this category are targeted at development partners that support ACP countries with technical assistance on R&I policy-making - especially formulation and implementation, evaluation, reviews, research, capacity building, STI for SDGs, and technology-related aspects, such as technology needs assessments and foresight. Development partners in this category include the OACPS, the UN (UNCTAD, UNESCO, and UNTBLDC), the European Commission (including DG INTPA, JRC), FDCO, SIDA, and IDRC, among others.

- Initiate a shift from R&I policy formulation support for ACP countries to a more targeted support for implementation, MEL, and governance. One reason for this is that most ACP countries already have R&I policies in place. Secondly, formulation does not result in significant development impacts. Implementation, enabled by robust governance framework, must henceforth become the priority.

- In supporting R&I policy-making – formulation, implementation, MEL, and governance – ensure alignment with national development priorities and long-term sustainable development goals. It is worth noting that ACP countries will first look at their priorities before they consider international goals. Therefore, OACPS in their value proposition and seeking for alignment to UN SDGs – must be cognisant of supporting national priorities and regional linkages.

- Help ACP countries establish sustainable R&I funding frameworks, mechanisms, and instruments. Funding through development cooperation initiatives is essential but may not be sustainable in supporting long-term R&I policy ecosystems and implementation efforts. Efforts in this regard should seek to stimulate private sector-led funding instruments such as venture capital funding, angel funding, and crowd funding.

- Support ACP countries in developing and operationalising R&I policy MEL frameworks and indicators meeting international standards that are also responsive to developing-country contexts, for example applicability to grassroots and informal sector innovations, while also being aligned to global aspirations.

- Emphasise and support the building of R&I policy capabilities and skills needed to formulate, implement, monitor and evaluate, and govern R&I policies and ecosystems in ACP countries.

- In supporting policy-making across ACP countries, promote inclusivity in the respective policy processes. There is also a need to consider, appreciate and include indigenous knowledge in R&I policy-making, to allow inputs from traditional perspectives rather than a top-down approach.

- Develop and institute mechanisms – for example, a peer-learning platform for policy-makers – to share best practices with ACP countries on prioritisation and alignment. Such policy learning platforms may help ACP countries improve their capacities on how to better formulate, implement, prioritise and align their R&I policies in ways that enhance development outcomes and impacts.

- Support learning and experimentation, with demonstrations of new and alternative approaches to policy formulation and implementation of R&I policies for transformative change, evaluation, and the development of governance frameworks. Currently most ACP countries do not have governance frameworks in place and, for those that do, implementation of these frameworks or structures remains weak.

- Enhance the ability of ACP countries to better understand the role of politics and power in R&I policies and policy-making. Implement effective ways to manage the relationships and tensions between R&I policies and politics, without stifling innovation and development.

Annexes

Annex 1 /
List of interviewees

Name of Participant	Surname of Participant	Country	Organisation	Position	Gender
From participating countries					
Christelle	Amina Djouldé	Cameroon	MINRESI	Head of Scientific Cooperation	F
Desta	Abera	Ethiopia	Ministry of Science and Technology	Director, Science and Technology Policy Research and Future Planning	M
Solomon	Benor	Ethiopia	National Contact Point (NCP) Coordinator for Horizon Europe Programme, Ministry of Education (MoE)	CEO, Research and Community Engagement Affairs	M
Helen	Fikreyohannes	Ethiopia	Ethiopian Academy of Sciences	Science Centre Director	F
Azeb Assefa	Mersha	Ethiopia			F
Mucktarr	Darboe MY	Gambia	MoHERST	Deputy Permanent Secretary-Technical	M
Manneh	Fatou	Gambia	MoHERST	Senior Research Officer	F
El Hadj Mohamed Ramadan	Diallo	Guinea	MESRSI	Deputy Director Research	M
Mamadou Saïdou	Bah	Guinea	MESRSI	Deputy Director Innovation	M
Tonny	Omwansa	Kenya	Kenya Innovation Agency	CEO	M
Agnes	Tsuma	Kenya	Kenya Innovation Agency	R&I Manager	F
Walter	Oyawa	Kenya	National Commission for Science, Technology & Innovation (NACOSTI)	General Director	M
Parita	Shah	Kenya	Department of Geography, Population and Environmental Studies, University of Nairobi	Lecturer	F
Matsepo	Nkhi Mosoka	Lesotho	MICSTI	Senior Research Officer	F
Mojalefa	Sello	Lesotho	MICSTI	Research Officer	M
Ahmed	Elmouna	Mauritania	ANRSI	Director	M
Mohamed	Yahya Dah	Mauritania	MESRS	Director of STI	M
Poonam	Veer-Ramjeawon	Mauritius	Mauritius Research and Innovation Council	Research Coordinator	F
Lucia	Silva	Mozambique	MCTES	National Deputy Director of Science, Technology, and Innovation	F
Edson	Faria	Mozambique	National Research Fund (FNI)	Finance Director	M

Name of Participant	Surname of Participant	Country	Organisation	Position	Gender
Nhlanhla	Lupahla	Namibia	National Commission on Research, Science and Technology	General Manager	M
Lisho	Mundia	Namibia	Ministry of Higher Education, Technology and Innovation	Director, STI	M
Joseph	Raj	Seychelles	Ministry of Industry, Division of STI	Principal Research Officer (Innovation)	M
Jessica	D'unienville	Seychelles	Ministry of Industry, Division of STI	Principal Research Officer (Research & Development)	F
Mnyone	Ladslaus	Tanzania	Ministry of Education Science and Technology	Assistant Director STI	M
Mbwana Yahya	Mwinyi	Tanzania	Ministry of Education-Zanzibar	Director ICT	M
Jose Cornelio	Guterres	Timor-Leste	INCT	Executive President	M
Jacinta	Dos Santos Guterres	Timor-Leste	INCT	Chief of the Department of STI and Ethics	F
Kouami	Kokou	Togo	Ministry of Higher Education and Research (MESR)	Director of Scientific	M
Ben	Makayi	Zambia	Ministry of Tech and Science	Senior Science and Technology Officer (MEL)	M
Chilambwe	Mwandsa	Zambia	Ministry of Tech and Science	Senior Science and Technology Officer (SPD)	F
From regional and international organisations					
Name of Participant	**Surname of Participant**		**Organisation**	**Position**	**Gender**
Jean Michel	Sers		European Commission	Policy Officer	M
Norbert Richard	Ibrahim		OACPS	Assistant Secretary General in charge of the Political Affairs and Human Development Department	M
Federica Irene	Falomi.		UN Technology Bank for LDC	Economic Affairs Officer,	F
Dimo	Calovski		UNCTAD	Economic Affairs Officer	M
Ignacio	Sanchez Diaz		UNEP	Resource Efficiency Officer	M
Kornelia	Tzinova		UNESCO	Assistant Programme Specialist	F
Samuel	Partey		UNESCO	Programme Specialist	M

Source: Authors

Annex 2 / Methodology

The methodology included the following steps:

i. Literature review and secondary data

The literature review was meticulously conducted in accordance with the established theoretical framework on R&I and transformative innovation theory. Additionally, the literature was enriched with insights from workshops, interviews, and expert knowledge.

ii. Workshop – MLE

The MLE was facilitated by experts in R&I policy development and implementation. The sessions were structured in such a way that, to begin with, the countries were able to present the pros and cons of R&I policy implementation in their respective countries. Starting with evidence of the existence of such policies and strategies in their countries. Based on the information provided and the analysis thereof, key emanating issues were identified that complemented the ones common to most states. These were further discussed in group sessions, which allowed in-depth analysis through SWOT and PESTLE, among other tools, to reflect on internal as well as external factors affecting the implementation of R&I policies in the participating countries towards their sustainability.

This served as a basis for the MLE Handbook compilation with additional information being sought through the national focal point contacts following the meeting. The meeting explored other means to collect relevant data and information outside the formal sessions where additional material relating to the R&I policies and strategies could be obtained to augment the MLE outcome.

In this framework, the exchange of knowledge and experience between countries on how to successfully develop and implement R&I policies and strategies could be useful not only to strengthen ongoing, upcoming, and future R&I initiatives, but also to provide a unique opportunity to establish long-term networks and new partnerships between countries and with regional entities.

The exchange was conducted in English and French. Interpretation was provided.

iii. Capacity building component: training workshop on STI policy and policy instruments for SDGs

Regions and countries need to build capacities to create robust STI systems to achieve the SDGs and address pressing environmental, health, economic and social challenges of the global crisis, such as the current pandemic. In Africa, governments are increasingly recognising the need to invest in STI capacities to implement the African Union (AU) Agenda 2063 and the African Strategy on STI (STISA-2024).

In this context, the UN-IATT and OACPS organised a training workshop on STI policy and policy instruments for STI officials from OACPS countries.

The purpose of the two-day workshop was to build awareness and understanding concerning key aspects of STI policy development and implementation, as well as innovation, entrepreneurship, open science, gender in STI, and how these relate to the SDGs.

The sessions aimed at engaging participants in interactive discussions and a practical reflection on existing approaches, case studies and national experiences in establishing and managing R&I in the context of the SDGs. Interactive tools and exercises were proposed during the sessions.

The proposed sessions followed specific objectives:

1. Sharing knowledge and practices using different methodological approaches to the design and implementation of STI policies and instruments.
2. Recognising the importance of transparent, participatory, inclusive, and evidence-based STI policy-making processes, with effective monitoring and evaluation.
3. Understanding the importance of establishing an appropriate and well-balanced policy mix of instruments and means to help address global challenges.
4. Sensitising the participants to the requirement for successful STI policy implementation.
5. Increasing awareness that productive actors – private enterprises, public firms, small and medium-sized enterprises, farmers, inventors, entrepreneurs – are crucial to responding to the global crisis and contributing to achieving the SDGs.
6. Appreciating the need to support innovation and entrepreneurship through government support, financing, etc.
7. Discussing key concepts and recognising their transformative power, such as open science, technology needs assessment, and gender equality in STI.

iv. Interviews

Following the presentation and further refinement of the key issues identified as being critical to R&I policy, a questionnaire was designed by the experts, which sought to get additional information at country level. The questionnaire was to be administered to different partners. The interviews were conducted by an expert with representatives from each country, including the UN agencies. The questionnaire placed emphasis on getting additional information on R&I policy formulation practices, providing access to policy and related strategic documentation, and allowing collective assessment.

v. Online presentation of the Handbook chapters to stakeholders and gathering of feedback

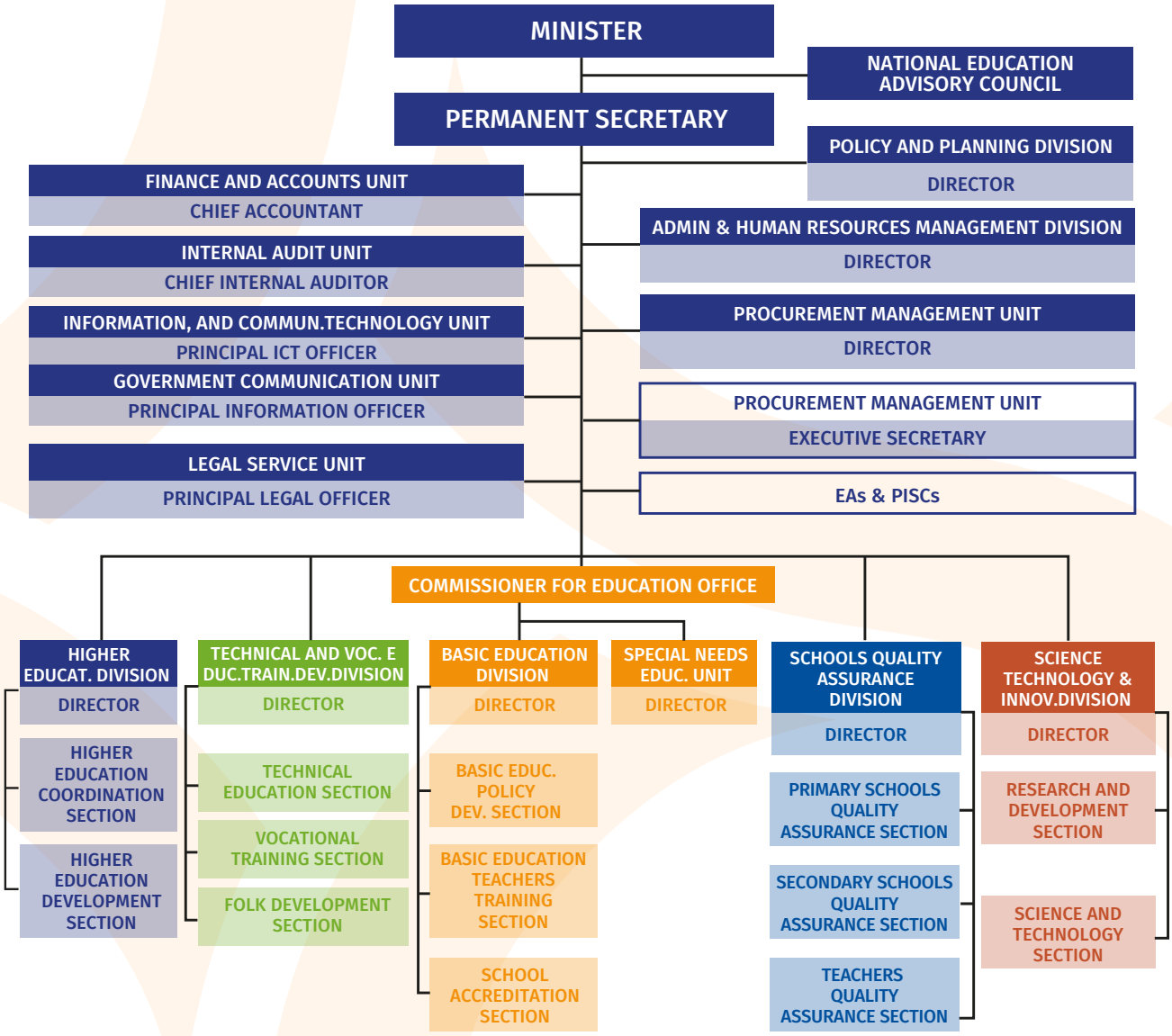
On 27 July, the draft Handbook was presented to participating countries and UN experts by the experts and OACPS teams. This was an online session that was moderated by the experts.

Following the presentation, feedback was received by the experts and was then further reviewed and incorporated to improve the draft Handbook. The feedback was received both verbally and through submissions.

vi. Validation

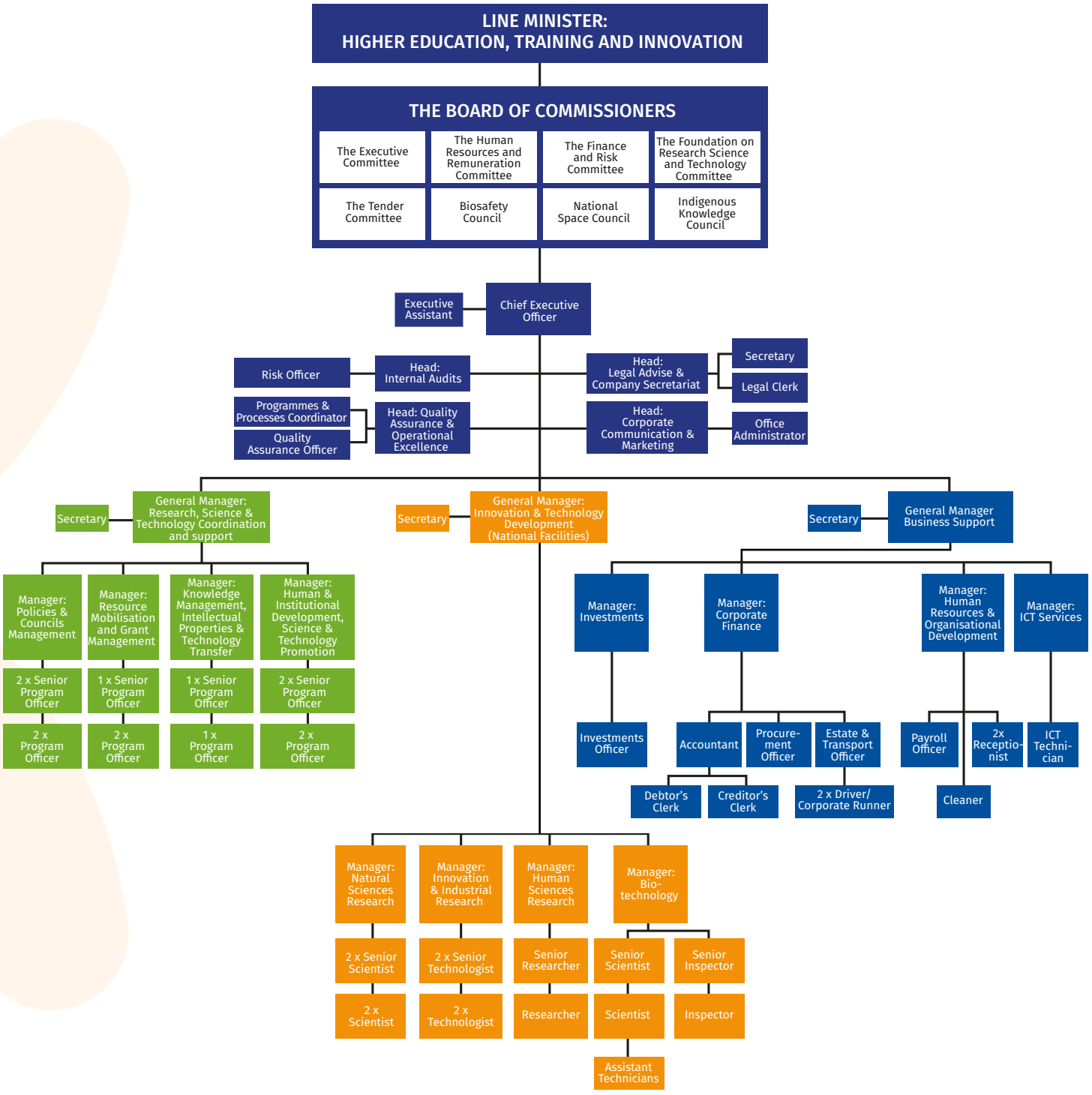
Validation workshop programme, Monday 30 October 2023.

Annex 3 /
Organisational Structure at the Ministry of Education, S&T, Tanzania



Source: https://www.moe.go.tz/en/structure

Annex 4 /
NCRST, Namibia, Organisation Structure



Source: https://ncrst.na/organisation/organogram/

Annex 5 /
Interview protocols

Annex 5a: Interview questions at OACPS country level **- national contacts/agencies personnel**

1. Name:
2. Date:
3. Time:
4. Contacts/institutions:
5. Country:
6. Role/position:

- What is your view of the STI landscape in your country?
  Bad, Good, Excellent

Good Science Technology and Innovation policy framework;
What is the stage of STI policy framework development/implementation in your country e.g., conceptual, review, implementation:

- What are the key steps taken to develop and implement STI policies in your country?
  - ____
- Given the 8 areas identified
  - (Questions that are responding to each)
  - **Finance** – (what are the key challenges in funding?)
    what are the best practices in funding STI?
    - ____
  - **Political**- what is the level of political support and what is being done to improve buy in?
    (Explore best practice in your country):
    - ____
  - **Inclusiveness** –how do you mainstream issues of gender, IKS etc.?
    (Explore best practice in your country):
    - ____
  - **Implementation and formulation** – what are the key challenges?.
  - **Prioritisation** - how do you prioritise STI (best practices in prioritisation) in your country?
  - **Governance** - how is the governance framework and what are its successes? (How does it deal with issues of collaboration, coordination and other cooperation partnerships?)
  - **Monitoring and evaluation** – how are you addressing the challenges of M&E (which indicators are used to M&E)?
  - **Capacity** –how are you addressing the challenges of capacity (what are opportunities and success factors)?
- Is there a communication strategy for the implementation of STI policy?
  - ____
- Cite examples (case studies) of issues relating to STI in your country:
  - ____
- What improvements and actions would you recommend given your opinion on the STI landscape and position and any other general aspects?
  - ____
- Share key documents, citations, literature that speaks to the STI policy and its related instruments.

Annex 5b: Interview questions with **international contacts/ agencies personnel (IATT WS6)**

1. Name:
2. Date:
3. Time:
4. Contacts/institutions:
5. Country:
6. Role/position:

i. Overall question: What is/are your main area(s) of expertise and intervention on R&I/STI policy?

II. When supporting countries or regional organisations on STI policy, what are some of the best / good practises you have identified under the eight (8) areas below?

- **Finance** – from your experience, what are the good/best practices in funding STI, at national level that you have come across?
  - ____
- **Political** - what are the good/best practices in improving political support and buy-in by government actors at country level that you have come across or are aware of?
  - ____
- **Inclusiveness** – from your experience how best can countries mainstream issues of gender, indigenous knowledge system (IKS), youth, other types of innovation (social, grassroots, frugal), etc. in their R&I/STI policies? Any case studies that you can cite?
  - ____
- **Implementation** – from your experience, what are the good/best practices in implementation, at national level that you have come across?
  - ____
- **Prioritisation** – from your experience how can countries best prioritise their R&I/STI policy priorities? Any case studies that you can cite?
  - ____
- **Governance** - what are the good/best practices in R&I/STI policy governance (including issues of collaboration, coordination, cooperation, and partnership) at country level that you have come across or are aware of? Any case studies that you can cite?
  - ____
- **Monitoring and evaluation** – what are the good/best practices in R&I/STI policy M&E at country level that you have come across or are aware of? How is the country (or countries) you are referring to addressing the challenges of M&E (which indicators are used)?
  - ____
- **Capacity** – from your experience how are you addressing the challenges of capacity? Any good/best practice you can share in this regard?
  - ____

III. Anything else you would like to share (case studies, messages)?

Also,

- Are there any key/relevant documents that you can share, that speak to the STI policy and its related instruments?
- Who else would you recommend that we interview?

Annex 6 /
About the authors

Professor Chux Daniels is a Research Fellow in Science, Technology and Innovation (STI) policy at the Science Policy Research Unit (SPRU), University of Sussex, UK, and Associate Professor at the Graduate School of Technology Management, University of Pretoria, South Africa. His research connects STI and public policies in fostering transformative change that contributes to achieving sustainable development. He is the Founding Director of the Transformative Innovation Policy Africa Hub (TIAH) based at the Future Africa Campus, University of Pretoria. TIAH involves several countries in Africa (Botswana, Ghana, Kenya, Malawi, and Senegal, and South Africa) collaborating with global partners in the UK, Netherlands, Sweden, Finland, Colombia, and Panama in the Transformative Innovation Policy Consortium (TIPC).

Dr Budzanani Tacheba is Director of Science and Technology and Capacity Development at SASSCAL, a joint initiative of Angola, Botswana, Namibia, South Africa, Zambia, and Germany aimed at strengthening the regional capacity to generate and use scientific knowledge products and services for decision-making on climate change and adaptive land management. Prior to this, he served as founding Executive Director for Innovation and Technology at the Botswana Digital and Innovation Hub (BDIH), where he oversaw innovation support programmes facilitating R&D, innovation and technology funding/commercialisation.

Ms Mariem Kane is the Director of Innovation for the Ministry of Digital Transformation, Innovation and Modernisation of Administration in Mauritania. Prior to this, she was Secretary General of the National Agency for Scientific Research and Innovation of Mauritania (ANRSI). In this capacity, she was part of the national team that contributed to the development of the first R&I strategy in Mauritania with the support of the MSP department. She also worked in the R&I and ICT sectors in France and Mauritania and, as consultant, for several international and regional organisations, such as the World Bank, the International Organization for Migration, UNFPA and the French Agency for Development.

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