

NEEDS ASSESSMENT- DEVELOPING A WEB-BASED STI SCOREBOARD

Report for the consultative phase-pre-pilot in Kenya submitted to ACTS

Introduction

Investments in science, technology and innovation (STI) are at the heart of development and critical to ensuring long-term growth. Therefore, monitoring and evaluation of performance in STI becomes extremely important for any nation to drive policies, competitiveness, and benchmarking. Further understanding the data on STI indicators and how to monitor the various indicators demonstrates the progress that African countries are making to meet the Sustainable Development (SDG) goals. In this regard, and as part of the African science technology and innovation outlook (ASTII) programme, the African Union Development Agency (AUDA-NEPAD) and its partners have developed and selected key indicators for tracking the implementation of continental agenda such as the Science Technology and Innovation Strategy for Africa (STISA-2024). Various countries are part of this process including Kenya. Kenya has participated in the various surveys to contribute to the ASTII program including an initial work in the development of a framework to determine relevant STI indicators for the country.

This report explores the indicators developed for Kenya drawn from programs such as ASTII and those developed by different initiatives to provide recommendations for a web-based scoreboard. A scoreboard in the case of Kenya will be a collection of relevant indicators that can be used by various stakeholders to measure and monitor STI activities in the Country. The report goes further to assess potential for developing the indicators into a web-based platform, and possibilities of a hosting platform for the indicators in the various STI agencies or any relevant organization's webpages in the country. We also explored the challenges that might ensue in this process and provide a way forward according to stakeholders' perspectives. This rapid needs assessment research was jointly implemented by the Africa Centre for Technology Studies, the Africa Research and Impact Network, the AUDA-NEPAD development agency, the Science Policy Research Unit (SPRU) and Out of the Box (OTB) Africa.

The following objectives were pursued;

- Obtaining stakeholder's perspectives/views on the web-based scoreboard.

- Gathering broadly, types of input indicators, output indicators, impact indicators, enablers and linkages indicators and general indicators that should form part of the web-based scoreboard.

Findings from the consultations

The stakeholders welcomed the idea of having a web-based tool and mentioned the following as potential benefits;

- Useful in measuring innovative performance and other related outputs of a knowledge-based economy more particularly when policy makers pay attention to the data required for the assessment and monitoring of policy processes.
- Support the analysis of the performance of Kenya's innovation activities
- Enable the identification of multiple actors and institutions that have direct or indirect impacts on the innovative outcomes and performance of Kenya's STI.
- A tool for the design and implementation of public policies.
- Support the entire process of capturing STI indicators as well as demonstrate the processes of knowledge generation, dissemination and appropriation.
- Characterize the role of public policies in supporting science, technology and innovation

Current framework for selection of STI indicators

Coordination of STI indicators is done from the Ministry of Education, Kenya. The ministry has since developed a set of STI indicators to guide the national research and development (R&D) surveys. The indicators are drawn from various internationally recognized standards such as the OECD Frascati Manual (2015) and the Oslo Manual (OECD/Eurostat, 2005). Further, the STI Act of 2013 established three agencies: Kenya National Innovation Agency (KeNIA), National Research Fund (NRF) and the National Commission for Science and Technology (NACOSTI) with various mandates in the collection of STI indicators. Each of these agencies have a unique mandate which may overlap or lead to duplicity of roles curtailing efforts of STI indicator data collection. However, the current draft STI Policy of 2020 has been approved for submission to the Minister of Education and could support coordination efforts of STI indicators in the country.

While the stakeholders appreciated the 263 indicators from the excel file scoreboard that was shared, they suggested the current indicators in the excel scoreboard could be synergized with those proposed in the framework in Annex 1. This is the current framework guiding the three STI agencies in data collection.

Even so, it was noted that most of Kenyan R&D is overwhelmingly academic or carried out to meet the goals of various research institutes. There is a lack of indicators that can guide policy and decision making or where these exist, their interpretation for policy processes has been slow. In some instances, the lack of indicators to account for innovation in the informal sector has shifted the need for investments in the sector. It therefore becomes important to collect data and indicators that outline the innovation sector which wasn't presented in the current scoreboard.

Challenges and opportunities for a web-based scoreboard

Kenya's ability to develop advanced STI indicators is impeded by lack of public and private financial resources. Currently, Kenya is viewed as high risk country in terms of private equity financing. Other challenges include poor working conditions (low salaries), ineffective professional standards, outdated policies, outdated information, and inadequate training and research facilities that might impede the uptake of a web based scoreboard.

However, there are ongoing efforts that can be leveraged to harmonize data collection in the country. Kenya's National Commission (KNATCOM) for UNESCO is supporting the measurement of STEM and Gender Advancement (SAGA) by collecting gender segregated data around gender and STEM. The three STI agencies are also collecting various indicators which can be harmonised through a web-based dashboard. There will be need to come up with operational modalities including policies that guide this process more coherently.

As outlined in Annex 1, the three STI agencies are keen on collecting the indicators individually with NACOSTI playing a coordination role. However, with the different funding mandates, each agency is keen to collect indicators useful to meet their own agendas. There is an opportunity to harmonise and collectively contribute to the indicators through a web-based platform. While it is not clear which agency will play a hosting role, the current STI 2020

draft could support the harmonising efforts by anchoring the STI scoreboard in a web-based platform through the coordinating ministry of Education.

Annex 1: Kenya's STI framework and proposed indicators

Source: NACOSTI's consultative report

Kenya's STI framework	Proposed indicator
STI Expenditure	GDP per capita Total Gross Domestic Expenditure on R&D GERD as a Percentage of GDP GERD Financed by government GERD financed by business enterprise GERD financed by private not-for-profit GERD financed by individual donations GERD financed by the rest of the world S&T expenditure (% of GDP) Public budget on S&T Total expenditure in innovation activities Share of public funds in innovation activities expenditure
Human Resources in STI	Headcount of R&D personnel by qualifications Headcount of R&D personnel by field of research and gender Headcount of R&D personnel according to age R&D personnel and percentage of time devoted to R&D Total labour force Labour force with tertiary education Total R&D Personnel (Headcount and FTE) Female R&D Personnel (Headcount and FTE) R&D personnel (Head count and FTE) as a proportion of labour force Total Researchers (Head count and FTE) Total Researchers (Head count and FTE) - Female Researchers (Head count and FTE as a proportion of labour force) Total technicians (Head count and FTE) Total technicians (Head count and FTE) - female Researchers (Head count and FTE) – Medical and Health Science Researchers (Head count and FTE) -

	<p>Engineering and Technology</p> <p>Researchers (Head count and FTE)</p> <p>Researchers (Head count and FTE) -</p> <p>Agriculture and Veterinary Science</p> <p>Female Researchers (Head count and FTE) - Medicine and Health Science</p> <p>Female Researchers (Head count and FTE) Engineering and Technology</p> <p>Female Researchers (Head count and FTE) Natural Sciences</p> <p>Female Researchers (Head count and FTE) Agriculture and Veterinary Science</p> <p>Researchers (Head count and FTE Social Sciences</p> <p>Researchers (Head count and FTE) -Humanities</p> <p>Female Researchers (Head count and FTE) Social Sciences</p> <p>Female Researchers (Head count and FTE) Humanities</p> <p>Total personnel in innovation activities</p>
STI environment/outputs	<p>Total number of scientific publications</p> <p>Total number of completed research projects</p> <p>Percentage of completed research projects</p> <p>Number of registered patent applications</p> <p>Granted patents - Resident</p> <p>Granted patents - Non-Resident</p> <p>Number of commercialized products/ processes/services from research projects</p>
STEM Education	<p>Total studentpopulation -Higher Education</p> <p>Female student population Higher Education</p> <p>Total enrolment in STEM programmes</p> <p>Total female enrolment in STEM programmes % of female enrolment in STEM programmes</p>

Firm Activities	<p>Gross fixed capital formation (GFCF) as a % of GDP</p> <p>Gross fixed capital formation by sector as a % of GDP</p> <p>Distribution of private sector GFCF</p> <p>R&D expenditure and funding in the private sector</p> <p>Business expenditure on R&D (BERD) as a % of GERD</p> <p>Disbursements of innovation-related grants to the private sector</p> <p>Foreign Direct Investment</p> <p>Type of innovation (product, process, organizational and marketing)</p> <p>Sources of innovation</p> <p>Cooperation for innovation</p> <p>Effects/objectives of innovation</p>
Technology infrastructure	<p>Fixed telephone subscriptions</p> <p>Fixed broadband subscriptions</p> <p>Internet servers</p> <p>Networking services</p> <p>State of 4G and 5G connectivity</p>
Technology adoption	<p>Mobile Device Penetration</p> <p>Internet usage</p> <p>Cloud services (IT spend forecast)</p> <p>Mobile money transfer</p> <p>Mobile Device Penetration</p>
County STI Performance	<p>County R&D performance</p> <p>STI county government funding</p> <p>County innovation and entrepreneurship performance</p>

