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**Understanding knowledge systems and what works to promote science technology and innovation in Kenya, Tanzania and Rwanda – insights from the Knowledge Systems Innovation Project (KSI)**

## **Policy Brief for Tanzania**

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## **POLICY OPTIONS FOR ENABLING INVESTMENTS IN SCIENCE TECHNOLOGY AND INNOVATION IN TANZANIA INSIGHTS FROM THE KNOWLEDGE SYSTEMS INNOVATION RESEARCH**

### **Summary**

Science, Technology and Innovation (STI) is a key enabler for transformation in achieving Tanzania's vision 2025, the country's long-term framework for development. The vision places emphasis on the role of research and innovation; local entrepreneurship and technological development to transform the country from a low productivity agricultural economy into a semi-industrialized economy. This ambition resonates with the aspirations of African Union Agenda 2063, the STISA 2024 framework 'knowledge driven economies and the Sustainable Development Goals (SDGs). In order to build effective STI systems, Tanzania has made various strides including the establishment of various institutional arrangements to coordinate and fund research and innovation within the country. The Tanzania Commission for science and Technology (COSTECH), plays a major role in coordinating and fostering STI activities while the National Fund for the Advancement of Science and Technology (NFAST) is responsible for financing STI activities.

Tanzania has made considerable strides including the establishment of various institutional arrangements to coordinate and fund research and innovation in the

Despite these efforts, the country still continues to lag behind in implementation of the STI policies as well as designing effective STI strategies that can contribute to addressing societal challenges.

To address the current situation, the United Kingdom Government's Foreign, Commonwealth and Development Office (FCDO) through the East Africa Research and Innovation Hub (EARIH) financed a pilot study to develop a practical approach to capacity development and investment in knowledge systems, in three East African countries (Kenya, Rwanda and Tanzania). The study sought to gather evidence on the current STI environment including identifying opportunities for investment to support sustainable development. This policy brief provides an overview of the key characteristics of STI system in Tanzania, emerging opportunities supporting SDGs and possible policy options for future STI investments that can deliver for the SDGs.

### **RESEARCH APPROACH AND INSIGHTS**

Knowledge systems span across sectors and disciplines and so an integrated approach to information gathering and analysis is required to generate a clear picture of a country's system. The approach adopted by this study was informed by dialogue and co-production of insights by researchers, policy makers and other stakeholders in Tanzania. Five sequenced dialogue sessions were undertaken with a wide array of relevant stakeholders. These sessions built upon a background review of current STI policies and sector knowledge priorities in addition to other knowledge evaluation /research documents in order to characterize Tanzania's knowledge system and identifying gaps and opportunities for future interventions. Specific targeted interviews with key government and non-

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governmental institutions provided examples of what is working well or what is not and how future opportunities could be actioned. The study also relied on the feedback and validations from the wider African research community via discussions engaging the broader Science Granting Council activities. Study insights and recommendations were further validated through national and regional advisory committees which comprised experts and technocrats with long standing experience in formal and informal knowledge management.

### **An overview of the current STI environment in Tanzania**

Current policy efforts that supports research and capability building are aligned by the development vision of industrialization. The country established the Commission for Science and Technology (COSTECH) as the national institutional architecture that provides STI regulatory function. State and non-state actors support knowledge production and use with a focus on agriculture co-production. State-led knowledge production is mainly anchored on public universities, public research institutions and the Vocational Education Training Authority (VETA). Emerging structures are innovation hubs, accelerators and incubators complementing industrial knowledge needs while linking local and non-local knowledge production and impact. Non-state actors such as think tank institutions and consultancy firms continue to spur international partnerships for enhanced knowledge production in various fields including in areas related to STI.

Current STI policy focuses on research and capability building to support the development vision of industrialisation in the health and agricultural sectors.

A few examples of alternative interventions in STI exist focusing on supporting productive interactions between formal and informal sectors and knowledge supported by public agencies. For example, the

Key trends in STI investment and their relevance to the SDGs are emerging through public agencies particularly supporting formal-informal interactions beyond set

Tanzania Industrial Research and Development Organization (TIRDO) has provided consultancy services to industry to support multinational companies to use indigenous and informal knowledge and technologies in the development of products and services for poorer communities. Research institutions as revealed by a case study on Institutional innovations in agricultural technology outreach, a case of

Sokoine University of Agriculture's Village Knowledge Centre are also supporting formal and informal knowledge interactions to create higher research-practice pathways through the active engagement of researchers in co-innovation. By way of example, as the village knowledge centers evolved and matured, they became a knowledge exchange for a diversity of topics beyond agriculture. Their original mandate included promotion of technology and innovation relevant to smallholder farmers but has expanded to identify, negotiate and develop shared value opportunities that benefited smallholders and the private sector e.g. developing of milk production processing and marketing systems.

## Why should the country widen its approach to STI investments?

Both formal and informal interactions are emerging as critical to support inclusion of actors across the knowledge system e.g. training in the informal sector can lead to employment opportunities in the formal sector. A case study that studied *the impacts of innovations in the context of knowledge systems: looking at the case of Buni Innovation Hubs versus Tanzania Vocational Education Training Authority (VETA) Programs* revealed high absorption rates of these graduates in the formal sector (especially energy sector) including high employment rates in the fields such as electricity, gas, steam and air conditioning supply, construction, wholesale and retail trade, ICT, arts, entertainment and recreation. This supports and recognizes the importance of practical experience in place of formal qualifications as entry requirements for courses, a route to an inclusive model of training.

Findings indicate that diversity of approaches with promising SDG intent such as facilitating informal-formal interactions are key to support inclusion of actors and supporting higher (diverse)

As demonstrated by another case study *on Institutional innovations in agricultural technology outreach, a case of Sokoine University of Agriculture's Village Knowledge Centre*, formal and informal knowledge interactions create higher research-practice pathways through the active engagement of researchers in co-innovation. While the case study is a project funded at a pilot scale, it has demonstrated valuable type of engagement between knowledge producers and users. Going forward, such promising STI initiatives need to be embedded in a broader programme of organisational development if they are to be sustained beyond pilot projects.

### Collective approach to STI Investments

Wider stakeholder consultation with COSTECH playing an advisory role not only informed the case study selection but also investment priorities in the Tanzanian STI ecosystem. In Tanzania, it was concluded that investments should be made into funding coordination agencies of the STI system specifically in three areas namely:

3 areas identified by stakeholders along with series of policy-related insights that could be considered

#### 1. Support productive interactions between formal and informal sectors and knowledge.

*There is need to explore alternative interventions in STI which are capturing and supporting indigenous and informal technologies and facilitate their interactions with the formal sectors. There also a need to establish and/or strengthen existing knowledge exchange networks/centers that seek to find and share solutions to community development challenges. In doing so consideration should be on how they can be effectively integrated and leveraged to contribute to transformation of the STI systems.*

#### 2. Support of research initiatives linking with end users

*It is crucial to explore how village knowledge centers can be replicated where the research agenda evolves to support not only scientific ideas but also mutually beneficial to the local communities. Introduce information centres in Vocational Education and Training Institutions to facilitate formal informal interactions & ensure such initiatives are supported and scaled up in Tanzania KS environment.*

*Also, the institutions VETA should consider expanding and upgrading capacity to absorb more than the current intake which stands at 30% through capacity and capability building of the trainers, acquisition of learning infrastructure and equipment.*

### **3. Investments in data collection for decision making**

*With specific reference to the innovation hubs explored, a more detailed diagnostic of this ecosystem is required to generate quantifiable data and more in-depth information about their organization, business models, gaps and their impacts. This will enable; (i) more appropriate investments strategies including programs that need to be supported besides ICT (ii) exploration of a management/hosting model that reduces bureaucracy to encourage private sector linkages and more collaboration with formal and informal local institutions (iv) explore opportunities to target start-ups with inclusive and sustainability business models.*

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