

CONCEPT NOTE

(Zambia EDITION)

UNCTAD TECHNOLOGY ASSESSMENT PROJECT
ON ENERGY AND AGRICULTURE

NATIONAL STAKEHOLDER WORKSHOP

5-6 April 2022

Introduction

Technology assessment (TA) is becoming a powerful toolbox for making strategic choices on new technologies' procurement, development, introduction, and governance. It is about a critical and participatory assessment of a particular technology's social, economic, and environmental benefits and risks.

TA is still in its infancy in Africa. Its application as a vital tool for technology policymaking is just starting to attract the attention of academics, technocrats and policymakers, and legislatures on the continent. However, there have been various TA-like initiatives in health, energy, water, agriculture, and some TA on specific technologies such as biotechnology and nanotechnology in Africa.

Demand for TA in Africa is likely to grow for at least three reasons. First, African countries are increasingly emphasizing the role of new technologies in sustainable development. This is reflected in the kinds of national science, technology and innovation (STI) policy frameworks that many countries in the continent are adopting. Second, countries are exposed to a large and growing pool of technologies and technological options, making it critical to adopt specific tools and approaches for making wise technology choices. In this regard, TA is recognized as a vital 'methodological toolbox' for selecting particular innovations from an extensive global pool of technologies.

The capacity of African countries to design and use TA largely determines the quality of their policies and programmes for technology and innovation in a wide range of sectors such as health, energy, agriculture, mining, fisheries, security, and transport. It is critical in policymaking on Foreign Direct Investment (FDI), technology transfer and acquisition, domestic investment in research and innovation (R&I), technology prospecting and procurement, environmental regulation, and many aspects of sustainable development. Moreover, TA capacity is urgently required during times of crisis and uncertainty, such as the current COVID-19 pandemic and related systemic socio-economic crises. Government, private sector and even civil society organizations are expected to make decisions urgently on what technologies (particularly medical or health ones) to procure and deploy in health and economic systems that are fragile or under constant pressure.

To develop the capacity in Technology Assessment in Zambia, the Ministry of Technology and Science (MoTS) will participate in the pilot phase of the United Nations Conference on Trade and Development's (UNCTAD) project on Technology Assessment in Agriculture and Energy sector in Sub-Saharan Africa. South Africa and Seychelles are also participating in this project.

This UNCTAD project seeks to strengthen capacities of national Science, Technology and Innovation (STI) policymakers and other stakeholders in Sub-Saharan Africa and propose policies and mechanisms (know-how) that support the learning, diffusion, and adoption of technologies in the energy and agricultural sectors and help build resilience to and recovery from the COVID-19 pandemic and future health emergencies.

The national workshop will take place over 2 days, with one day dedicated to *agriculture*, and the second day will focus on *energy*.

Objective

To better organize coordinated participation for Zambia in the project through engagement with the Zambian players. In cooperation with UNCTAD, the Ministry of Technology and Science (MoTS) plans to organize a national stakeholder workshop. The workshop is expected to help achieve the following:

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- To understand better the concept of TA;
 - To identify gaps in TA, especially in Agriculture and Energy;
 - To identify priority areas for TA in Energy and Agriculture for Zambia;
 - To develop a work plan for Zambia's participation in the UNCTAD project; and
 - To design Zambia's TA methodology in partnership with UNCTAD.

The following areas may help guide the discussions:

Agricultural Sector

Over 50% of the Zambian labour force are engaged in agricultural activity, primarily in informal subsistence agriculture. As per Vision 2030, Zambia envisaged industrializing by embarking on a broader and more forceful process of technological upgrading and producing agricultural products and services with higher value-added and of higher value. The agriculture sector in Zambia comprises crops, livestock, and fisheries and is considered (along with copper mining) the mainstay of the economy, contributing about 30% to GDP. Productivity within the sector has not significantly increased in the last decade, mainly due to limited investment in scientific research and the development of new technologies and innovations. The sector continues to be dominated by subsistence farming methods in consumption rather than cash crops. Similarly, livestock farming has been characterized by poor feeding practices; poor, limited animal husbandry technology, which have led to high livestock mortality rates.

Further, in line with the country's National Development Plan (NDP), Government has committed to promoting aquaculture. This, coupled with a general increase in the demand for fish and availability of water bodies, provides room for a flourishing fish farming industry. However, this is hampered by the low limited investment in scientific research and the development of new and improved technologies. Besides, the advent of climate change that is causing droughts, deforestation, and loss of biodiversity has resulted in famine, heightened by technologically inadequate food storage and after-harvest processing, and a reduction in water bodies. This recent experience confirms that climate change in Zambia causes poverty and increases food insecurity. Climate change

contributes to keeping more than half of the country's population under the poverty line, throwing them into a downward spiral of ever-greater vulnerability from extreme climate events, such as droughts and floods.

Energy Sector

The electricity sub-sector largely dominates the energy sector in Zambia, with hydropower generation accounting for at least 84.5 percent. However, the dominance of hydropower generation puts the country at risk due to changes in climatic conditions, such as global warming leading to insufficient rainfall and drought, and other competing needs for water resources. These challenges pose a risk of inadequate water resources available for hydropower generation. In 2016, when the country experienced drought, power generation from coal was second at 10.6 percent (300 MW), followed by diesel at 3.1 percent (88.6 MW), while Heavy Fuel Oil (HFO) accounted for 1.8 percent (50 MW) and solar photovoltaic (PV), less than 0.1 percent (0.06 MW). Despite the threats to the country's energy security, Zambia has limited research and development capacity to explore alternative energy sources such as solar, wind, biofuels, geothermal, nuclear, and biomass.

As in many other African countries, the use of biomass (wood and charcoal) as the primary energy source in rural areas contributes to deforestation as well as to respiratory health issues. However, some known and available technological and knowledge-based solutions can help mitigate the most drastic outcomes associated with these elements. Another dynamic cluster has developed around solar energy, its capture, and use in rural and urban areas, coupled with innovative modes of digital payments by individuals or organizations using solar energy. For example, Fenix International designs, manufactures and distributes ReadyPay Solar kits, a mobile payment-enabled off-grid solar panel, and a smart battery system. Fenix international started operating in Zambia in October of 2017. It also operates in Uganda, where it hosts its Main Service Center, Côte d'Ivoire, Benin, Nigeria, and Mozambique. With support from development partners – the Swedish Embassy and USAID – Fenix has reached 150,000 Zambians in partnership with telecom MTN who provide the financial infrastructure: pay-to-own home

solar system financed through ultra-affordable installments over mobile money. One significant challenge was distributing to remote areas while relying on a fragmented transport logistics sector, based mainly on a 'one truck – one owner' model. Another firm, SolarWorX develops modular solar home and business systems and distributes them through local partners. SolarWorX is also involved in pico and mini-grid projects. SolarWorX operates on an entrepreneurial model.

Many appropriate technological solutions are available now and range from improving efficiency and noxiousness of cooking appliances, cleaner gas power, biomass digesters, and solar power. However, there is a clear need for frameworks and incentives for implementation. Zambia's Energy policy aims to increase access to electricity in rural areas. One key area at the interface with the food system is to promote sustainable exploitation of biomass and alternative energy to wood and charcoal fuel, which account for almost 75% of national energy consumption without compromising food security. The policy includes an explicit objective to promote innovation and R&D in the energy sector and specifically support research and adoption of renewable energy technologies (including biofuels).

National Policies supporting the development of the Agriculture and Energy Sectors

The following policies (some current and others in progress) will have the most impact on a move towards a net-zero economy. The most relevant policies are as follows:

Science and Technology:

- *2020 National Science, Technology and Innovation Policy*
- *2020 National Nuclear Policy*

Agriculture, Livestock

- *2020 National Agriculture Policy*
- *2020 National Livestock Policy*

Energy:

- *2019 National Energy Policy*

Environment, Forestry and Fisheries:

- *2007 National Environment Policy*
- *2014 National Forestry Policy*
- *2011 Fisheries Act.*

Transport:

- *2019 National Transport Policy*

Trade, Industry and Competition:

- *2018 National Trade Policy*
- *2018 National Industrial Policy*
- *Competition and Consumer Protection Act No. 24 of 2010*

The expansion of renewable energy and new and emerging technologies applied to the energy sector could contribute to ensuring universal access to affordable, reliable and modern energy services, as well as other sustainable development objectives such as reducing poverty, health, gender equality and climate action.

Women and girls play a significant role in developing countries' energy and agricultural sectors. Access to electricity can also increase gender equality by increasing the likelihood of girls finishing primary school, increasing the incomes of self-employed women, and increasing employment opportunities for women by increasing the efficiency with which household tasks can be completed.

Expected Outcomes

The expected outcomes of the workshop are as follows:

- List of key stakeholders to participate in the TA project

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- List of TA priority areas in both energy and agriculture sector
 - Proposal on a preferred methodology for the TA project
 - Timelines for the TA

Stakeholders/Partners

- United Nations Conference on Trade and Development (UNCTAD)
- Ministry of Technology and Science
- Ministry of Agriculture
- Ministry of Energy
- Ministry of Livestock and Fisheries

Stakeholders from the Agricultural sector

Government Ministries and agencies:

- *Ministry of Agriculture*
- *Ministry of Livestock and Fisheries*
- *Ministry of Green Economy and Environment*
- *Ministry of Transport*
- *Ministry of Commerce Trades and Industry*
- *Ministry of Education*
- *Ministry of Small and Medium Enterprises*
- *National Science and Technology Council*
- *National Institute for Scientific and Industrial Research*
- *National Technology Business Centre*
- *National Remote Sensing Centre*
- *National Biosafety Authority*
- *Zambia Information Communication Technology Authority*
- *Zambia Agriculture Research Institutes*
- *Central Veterinary Research Institute*
- *Zambia Privatization Agency*
- *Zambia Bureau of Standards*

Non-profit organizations & non-governmental organizations:

- *Bankers Association of Zambia*
- *AgriProFocus Zambia*
- *Zambia – Self Help Africa*
- *IAPRI*

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- *World Vision Zambia*
 - *USAID*
 - *SNV Zambia*
 - *Zambia - GIZ*

Academic Communities:

- *University of Zambia*
- *Copperbelt University*
- *Mukuba University*
- *Kwame Nkrumah University*
- *Robert Makasa University*
- *Mulungushi University*
- *Zambia Open University*
- *University of Lusaka*

Private sector:

- *Zambia Association of Manufacturers*
- *Zambia Chambers of Commerce and Industry (ZACCI)*
- *Private Sector Development Association (PSDA)*

Civil society:

Zambia National Farmers Union (ZNFU)



Stakeholders from the Energy Sector

Government Ministries and agencies:

- *Ministry of Energy*
- *Ministry of Green Economy and Environment*
- *Ministry of Transport*
- *Ministry of Commerce Trades and Industry*
- *Ministry of Education*
- *Ministry of Small and Medium Enterprises*
- *National Science and Technology Council*
- *National Institute for Scientific and Industrial Research*
- *National Technology Business Centre*
- *National Remote Sensing Centre*
- *Zambia Information Communication Technology Authority*
- *Rural electrification Authority*
- *Energy Regulation Authority*
- *Zambia Privatization Agency*
- *Zambia Bureau of Standards*

Non-profit organizations & non-governmental organizations:

- *Bankers Association of Zambia*
- *Zambia Academy of Sciences*
- *World Vision Zambia*
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- *Zambia Association of Manufacturers*
- *Zambia Chambers of Commerce and Industry (ZACCI)*
- *Private Sector Development Association (PSDA)*

Civil society:

Green Peoples Energy for Africa – Zambia