



Country Update

Leveraging Technology Development and Transfer to Tackle Climate Change: Views from Tanzanian Agro-Industries

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Introduction

Tanzania is among the countries suffering from the impacts of climate change and associated hazards such as floods and droughts that have significantly affected economic growth and poverty reduction efforts. The impacts of climate change are increasingly becoming vivid in various sectors including, the livestock, and agriculture, wildlife, water and health sectors.

Studies reveal that climate change will raise mean daily temperatures on average by 3oC – 5oC and mean annual temperature by 2oC-4oC throughout the country. From 1961-2005, the mean annual temperature has increased by 1oC -1.8oC throughout the country. Generally measurements from 21 meteorological stations have shown a steady increase in temperature over the past 30 years.

Unpredictability on the onset and cessation of rainfall seasons has been observed with projections showing that areas with bimodal

rainfall i.e. one season in a year (southern, south western, western, central and eastern parts) will experience a reduction of between 5%-15% in rainfall. Most of these areas are semi arid and are where livestock as well as agricultural activities are practiced and any decrease in rainfall availability will worsen the situation hence affect the livelihoods of many people.

Agro processors in Tanzania have now become more aware of the impact of climate change to their normal activities. Discussing with cassava and potato farmers in Mkuranga and Manyara respectively, they have expressed that due to these changes, they not only seek to adopt new but local technologies, but also assist farmers to use modern improved seeds that are more climate change resilient. However, due to lack of sufficient capital, it has become next to impossible for these farmers to adopt better modern technologies. With increased electricity costs, agro-processors have also resorted to the use of solar energy, but this is particular to small scale processors.

Sunflower oil processor in Manyara also revealed that, as a result of climate change, not only has he resorted to assisting farmers use modern improved seeds, but has even gone step further by providing extension services to ensure constant supply. In addition, because of lack of modern machines, the company has resorted to entering agreement with another manufacturing company to undertake double processing of the sunflower oil.

Objective

This note seeks to obtain the views of Tanzanian agro-industrials; especially Small and Medium Enterprises (SMEs), on their technology needs to tackle the impacts of climate change on their businesses, and if they are aware and use available technology development and transfer mechanisms to face the challenges posed by climate change.

Methodology

Views from SMEs working on agro-industry and some few policy makers were collected through field visits, phone calls and surveys. In data presentation, quotes are used to illustrate respondents' views on technology need and use as related to mitigation of climate change at the enterprise level.

Needed technologies to help agro-industries

The adoption of climate smart technologies has been very slow in Tanzania compared to her neighbour in the north, Kenya where most of climate smart agricultural technologies are very popular and commercially viable. In Tanzania technologies such as solar-powered irrigation systems, and soil testing technologies and insurance programs are not known to many agro-businesses. However the outstanding example is the use of mobile-phone apps and text messages by agro-businesses.

According to UNFCC these kinds of innovations have significant impact on agricultural value chain since SME's use the mobile phone text messages and apps to learn about better farming technologies, they also have significant effects to farmers' earnings as farmers use information received on their handsets to sell their products basing on the market value.

However, when asked of the type of technology that would be relevant for their businesses, the majority indicated technologies that would help increase supply of the agriculture produce and ensure constant supply are of paramount importance. In addition, post-harvest management technologies especially during drought seasons would help improve the companies' efficiencies. The following are some of the mentioned technologies:

The adoption of ICT solutions to build climate resilience: Most of the agro-industries are increasingly relying on ICT solutions and particularly on the use of cellular phone text messages and apps such as Vodacom's Kilimo Club to get weather updates, agricultural advisory services, loans, livestock and crops' market information.

Growing of seedlings through tissues: This technology is said to be of low cost but also ensures growth of many seedlings through small tissues. The technology also makes it possible to grow seedlings that are resistant to pests and diseases and the technology can be adapted to crops such as cassava, Irish potatoes, sweet potatoes etc.

Molecular biology technology: This technology has also been applauded as it helps scientists detect genes, pathogens and bacteria, which may infect the crops. A good example on the importance of this technology is in curbing stripe diseases on cassava crop.

Improved packaging technologies: The need to have improved packaging materials is also among the most crucial issue and the access to such technology will not only help improve the

agro-processing industry, but will also help curb post-harvest losses of the processed produces.

Automated machines rather than manual:

This has been mentioned by majority of the agro processors, reflecting that having assured automated machines near the farms will help farmers process their agriculture produce quickly and there after store until the right moment to sell. A good example is moving away from using chippers, local drying methods using canvas or elevated tables in processing cassava and potatoes. The case of Sunflower processing, it was also observed that lack of modern machines inhibits effective processing.



Sunflower Oil Primary Processing industry, Manyara

Adoption of improved storage facilities:

With increase in climate change effects, agro-processors have also resorted to establishing modern and advanced storage facilities such as cold rooms and well ventilated warehouses that monitor moisture content of the stored agro-processed products. In doing so, the processors are applying chilling and freezing of the products to increase shelf life.

Application of Minimal Processing (MP) technologies: This has greatly been observed in horticulture products such as fruits and vegetables, which include a washing/disinfection step, followed by addition of inhibitors of adverse reactions and modified atmosphere.

Technology Mechanisms to help agro-industries

Apart from the officials involved in UNFCCC discussions in the country, the rest of the respondents who were approached and interviewed lacked any knowledge of neither the existence of UNFCCC nor the technology mechanisms. However, those who had knowledge were aware that the UNFCCC does offer such supports to the LDCs and developing countries as well, and Tanzania being amongst. The respondents were quite conversant of the existence of both the TEC and CTCN, but were rather pessimistic on their effectiveness questioning whether these two will serve the interests of the developing countries or the developed.

It was further reported that UNFCC has been arranging financial support from international donors to help Tanzania undertake researches in areas such as Greenhouse gases mitigation, developing National Action Plan on Climate Change for Tanzania and Assessment of Vulnerability and Adaptation to Climate Change. Most of these researches are coordinated by the UNFCC in partnership with international donors who provide the funds, International environmental agencies such as UNEP and local organizations including Commission for Science and Technology (COSTECH). However this study revealed that majority of businesses are not aware on how they are going to benefit from these programs

Having no experience in utilisation of these mechanisms, the respondents were not able to mention how the country has been involved. However, the following points were raised as critical factors that technology transfer will have on agro-industrial development in Tanzania:

- a. **Improved quality of agro-processed commodities that would enable access international markets.** The notion behind here is that, most of the agro-processors believe

that, having high-tech will help improve produce up to standard products.

b. Assured supply of agriculture produce from the smallholder farmers.

Citing development and transfer of water pumping technologies for agriculture in some parts of Tanzania, agro-processors are assured of constant supply of the produce for processing.

c. Trade promotion is then next significant factor that technology transfer will ensure in such developing countries like Tanzania.

d. Income generation and offering employment opportunities to farmers and processors.

To access the technology easily, it was urged that deliberate measures should be taken by both developing and developed countries to promote technology transfer allow localisation of the technology so as to make it cheaper and easily accessible to majority of the agro-processors.

Furthermore, it is of paramount importance that the government promotes the establishment of agro-processing training-cum-production centers near agro processing centers to enhance knowledge and easy usage of technology.

Recommendations to

policy-makers & climate negotiators

1. It is important to call for access to affordable manufacturing equipments to our agro processors so as to have impact on growth of agro-business activities.

2. Need to call for increased levels of diversity in automation among the smallholder agro processors, which will eventually result to increase in number of agro-processing units in the country.

3. It is also very important to put more emphasis in training agro-processing entrepreneurs on mechanizing their business operations so as to increase efficiency and standardization of their products for better market performance.

4. The negotiators should call upon the government and other development partners to develop and facilitate mechanisms that will realistically increase access of friendly investment capital to the young generation (18 – 40 years) to purchase equipments for starting small-scale agro-processing businesses.

5. There is a need to call for increased level of agro-processing skills content in the agricultural extension packages passed to farmers so as to reflect the current national policy focus on industrialization as a way of commercializing agriculture.



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