



CLIMATE TALKS

Note

Taking Stock of INDCs: Potential Trade Impacts for East Africa

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Summary

This note examines the potential or likely trade impacts from implementing East African Community (EAC) Intended Nationally Determined Contributions (INDCs) on the economies of the EAC partner states. It begins with general background information on INDCs followed by an overview of EAC INDCs. Thereafter it looks at the potential positive and negative impacts of EAC INDCs on trade and concludes with recommendations on way forward.

Abbreviations and Acronyms

AFOLU	Agriculture, Forestry and Other Land Use
ALF	Agriculture Livestock and Fisheries
CDM	Clean Development Mechanism
CER	Certified Emission Reduction Credits
COP	Conference of Parties
EAC	East African Community
EPRA	Emissions Reduction Purchase Agreement
GHGs	Green House Gasses
INDCs	Intended Nationally Determined Contributions
ITMOs	Internationally Transferred Mitigation Outcomes
JI	Joint Implementation
LDCs	Least Developed Countries
LULUF	Land Use, Land Use Change and Forestry
NAPA	National Adaptation Programme of Action
NDCs	Nationally Determined Contributions
NCCAP	National Climate Change Action Plan
NCCP	National Climate Change Policy
SDGs	Sustainable Development Goals
SIDS	Small Island Developing States
SMEs	Small and Medium Enterprises
S. Sudan	South Sudan
UNFCCC	United Nations Framework Convention for Climate Change

Background

Intended Nationally Determined Contributions (INDCs) will play a critical role in the economic development of not only developing countries but developed countries as well. Designed to reduce Green House Gasses (GHGs) emissions in order to stop global temperatures from rising to more than 2 degrees Celsius, the co-benefits arising from implementing INDCs such as increased trade will have a significant impact on poverty reduction, Sustainable Development Goals (SDGs), and overall economic growth, especially for developing countries and Least Developed Countries (LDCs).

INDCs are the actions and targets that countries pledged to undertake ahead of the Paris Climate Change negotiations, which culminated into the “Paris Agreement”¹, in order to fulfil the objective of the United Nations Framework Convention on Climate Change (UNFCCC).² It is through INDCs that the 196 countries and one regional economic integration organisation (European Union) that are “Parties” to the convention will implement the “Paris Agreement”

The idea of INDCs first came up in Warsaw in 2013 during the climate change negotiations, also known as the Nineteenth Conference of Parties (COP 19).³ The call for INDCs was rather vague, and there were disagreements on

whether to include additional goals other than emission reduction targets.⁴ Later during the climate change negotiations in Lima (COP 20) in 2014, the nature of INDCs was specified clearly.⁵ Countries were to develop their own approach in a manner that facilitates clarity, transparency and understanding of the INDCs.⁶ They agreed to include information on emissions reduction, and consider including adaptation measures in their INDC. LDCs and Small Island Developing States (SIDS) were invited to either include their plans for developing in a low-carbon model in the INDC or follow the guidelines set for the rest of the countries, namely:

- A reference point;
- Time frame;
- Scope and coverage;
- Methodological approach towards calculating emissions; and
- How the contribution is fair and ambitious.⁷

Countries were invited to submit (those that were ready) their INDCs by the first quarter of 2015,⁸ given that the Paris negotiations were due for November 2015. However, by the 1st of October 2015, only 147 Parties had submitted their INDCs.⁹ By August 2016, there are 162

¹ It is the outcome of the Twenty First of the Conference of Parties to UNFCCC on climate change that took place in Paris, France from 30 November to 11 December 2015. The signing of the Agreement took place in New York on Earth Day 22 April 2016. The Agreement will come into force when it is ratified by 55 countries that account for at least 55 percent of global emissions.

² www.carbonbrief.org/explainer.what-are-intended-nationally-determined-contributions

³ Ibid

⁴ Ibid

⁵ <http://www.e-ir.info/2015/08/05/the-purpose-of-indcs-for-an-international-climate-agreement/>

⁶ http://unfccc.int/focus/indc_portal/items/8766.php

⁷ www.carbonbrief.org/explainer.what-are-intended-nationally-determined-contributions

⁸ Ibid

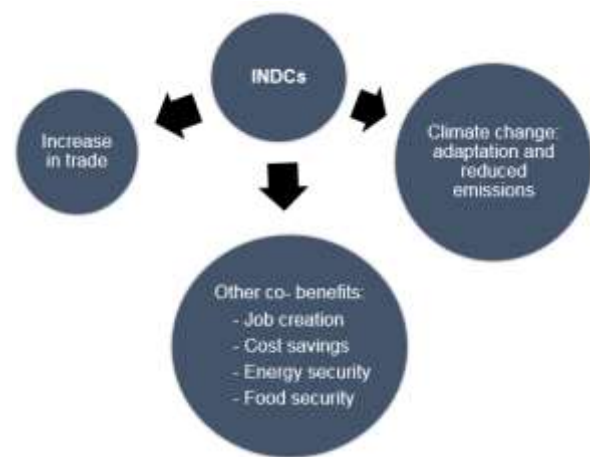
⁹ www.unfccc.int/focus/indc_portal/item/9240.php

submissions on the UNFCCC INDC Portal with the latest submission made in April 2016. INDCs will become Nationally Determined Contributions (NDCs) when the “Paris Agreement” comes into force, that is, upon its ratification by 55 countries that account for at least 55 percent of global emissions. By May 2016, 17 states, majority of which are SIDS, had deposited their instruments of ratification, accounting for 0.04 percent of the total global greenhouse gas emissions, much more still remains towards attaining the required target.¹⁰

Aside from playing a pivotal role in climate change, INDCs will also act as an engine for sustainable economic growth when well implemented, especially for developing countries (see fig 1 below). LDCs and SIDS are the worst affected by climate change. Extreme weather events have become more frequent and severe. For example, in the East African Community (EAC), climate change impacts pose a threat to the livelihoods of people in almost all sectors of the economies.¹¹ Floods, as well as frequent and prolonged droughts have led to reduced water supply, decline in crop yields, increase in pests and diseases, loss of property, and displacement of people.¹² Yet the biggest percentage of the population in the region depends on rain-fed agriculture, which is vulnerable to climate variability, seasonal shifts and precipitation patterns.¹³ Any impact on the agriculture sector is an obstacle to economic development and the well-being of the people of EAC. Considering this background, addressing

climate change is one of the priorities of the region. Speaking at the high-level segment of COP21 in Paris, the then Secretary General of EAC, Amb. Dr. Richard Sezibera committed to EAC partnership with the international community in ensuring the full implementation of the “Paris Agreement”, specifically to support her partner states in the ratification process to pave way for its entry into force.¹⁴

Figure 1: Impact of INDCs



Source: Author's own elaboration

Implementing the INDCs to address climate change in the EAC region will not only alleviate the impact of climate change, it will also create other opportunities like: increased trade opportunities; food security; energy security; creation of green jobs; technology transfer; cost savings from reduced fossil fuel imports, and chemical fertilisers. This will contribute to the overall economic growth and development of the region.

¹⁰ http://unfccc.int/paris_agreement/items/9444.php

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http://www.eac.int/environment/index.php?option=com_content&view=article&id=160Item=78

¹²

http://www.eac.int/environment/index.php?option=com_docman&task=doc_download&qid=130&Itemid=106

¹³

http://www.eac.int/environment/index.php?option=com_content&view=article&id=160Item=78

¹⁴<http://www.eac.int/news-and-media/press-releases/20151211/eac-secretary-general-cautions-climate-change>

This paper looks at the trade potential or likely trade co-benefits from implementing EAC INDCs. Specifically, how the adaptation and mitigation actions in the various targeted sectors in the INDCs will enhance trade in the EAC region. It also looks at the likely negative impacts of INDCs on the trade potential in the region.

Overview of EAC INDCs

The EAC is a regional intergovernmental organization composed of six partner states: Burundi, Kenya, Rwanda, South Sudan (S. Sudan), Tanzania, and Uganda. Following the dissolution of the former EAC that was between Kenya, Tanzania, and Uganda in 1977, the “new” EAC was re-established in 1999 with the original three countries as the first members. Burundi and Rwanda acceded in 2007 while South Sudan, the world’s newest nation, joined on 03 March 2016.¹⁵ By the end of December 2015, all the EAC Partner states (including South Sudan which was not a member by that time) had submitted their INDCs to UNFCCC but were to deposit their instruments of ratification by the time of this paper.

Table 1. Appendix A (see bottom of document) is an overview of the EAC INDCs. It looks at the mitigation and adaptation measure to be undertaken in identified priority sectors. It also looks at the existing policies on which the INDCs are based or derived. The target year in which to achieve the pledged actions under the INDCs is 2030 but the baseline year (for calculating business-as-usual projection scenarios) differs across the region.

Although including adaptation measures in the INDCs was not a mandatory procedure according to the guidelines of INDCs development, EAC partner states considered it a priority and it features in all the six EAC INDCs. EAC countries are among the worst affected regions by the impact of climate change, therefore adapting to the effects of climate change is a priority. The major objective in all the EAC INDCs is to strengthen resilience to climate change while continuing to meet the countries’ development challenges.

Important to note is the exclusion of the extractive sector in the INDCs except in the Kenya INDC. Kenya plans to integrate climate change adaptation into this sector. It plays a major role in emissions but also has big potential for trade expansion and overall economic development especially for the EAC partner states that have recently discovered oil and gas: this would however require sustainable management of these resources.

Targeted Sectors, Measures and their Contribution

Measures or goals to reduce emissions and adapt to climate change in EAC INDCs are to be operationalised through targeted sectors. Across the region, these priority sectors are almost the same but Agriculture, Energy, Water, and Forestry feature prominently. In some EAC INDCs, the sectors of Agriculture, Forestry, and Land Use are classified as subsectors of one sector namely, Agriculture, Forestry, and other Land Use (AFOLU) while in other INDCs they are classified under Land Use, Land Use Change and Forestry (LULUF). Other

¹⁵<http://www.eac.int/>

targeted sectors include Water; Transport; Fisheries; Waste Management; Ecotourism; Coastal and Marine Environment; Health; Human Settlements; and Disaster Management.

Table 2. below is a summary of the intended measures in the different priority sectors and their type of contribution in addressing climate change.

Table 2: EAC INDC Priority Sectors, Goals and Contribution

Sector	Measure/Goal	Contribution
Agriculture (including livestock)	Irrigation	Adaption
	Soil conservation and land husbandry	Adaptation and mitigation
	Control of animal and plant pests and diseases	Adaptation
	Agro forestry	Adaptation and mitigation
	Improved animal and crop breeds	Adaptation
	Organic waste composting	Adaptation and mitigation
Energy	Increase use of biomass fuels	Adaptation
	Expand and promote renewable energy	Adaptation and mitigation
	Increase efficiency and production of hydro energy	Mitigation and adaptation
Forestry	Reforestation and afforestation	Mitigation
	Agroforestry	Mitigation and adaptation
	Improved forest management for degraded resources	Adaptation and mitigation
Water	Invest in protection and conservation of water catchments like wetlands	Adaptation
	Invest in rain water harvesting structures	Adaptation
	Promote waste water reuse	Adaptation and mitigation
	Develop and exploit ground water resources	Adaptation
	Ensure supply to key sectors, especially agriculture	Adaptation
	Develop water resource models e.g. water quality testing	Adaptation

Source: Derived from EAC INDCs

Policies and Strategies into Action

The EAC INDCs are based on existing climate change frameworks as well as development policies and strategies of each individual partner state (See Appendix A) to reflect their various development needs.

The means of implementation of the EAC INDCs will depend on domestic and international support with the biggest percentage dependent on international support. In some of the INDCs, the actions for implementation with international support are clearly set out under “conditional targets” and the actions that will be undertaken using domestic resources as “unconditional”. More specifically the EAC partner states will use

domestic and International Support, finance and investment, technology development and transfer, capacity building to implement the INDCs.

While the adoption of INDCs was the International Community's ambition to turn round climate change, domestic policy making is needed to turn pledges into specific implementable policies and programs, and finance-ready investment plans.¹⁶ The INDCs need to include information on national and sectoral goals, how these goals will be achieved, as well as how to meet the costs. Some of the EAC INDCs are well developed with concrete actions for each identified target however, some are lacking in this regard. EAC partner states will need to convert their INDCs to turn the pledges into action because they need to:¹⁷

- Clarify effective pathways to reach their INDC goal, as well as opportunities for action with impacts beyond the INDC target date;
- Optimize the use of resources through effective use of domestic and international means, and lower transaction costs through comprehensive approaches to adaptation and mitigation;
- Achieve synergies between adaptation, mitigation and development goals, that is aligning national strategies and plans including INDCs, National Development

Plans, Nationally Appropriate Mitigation Actions;

- Make proposals more attractive to funders by enabling countries to justify the need for support in the context of the larger country strategy;
- Attract private sector investment by establishing long term policy signals and developing a pipeline of viable projects that investors need to justify engagement in; and
- Support long-term low carbon development strategies.

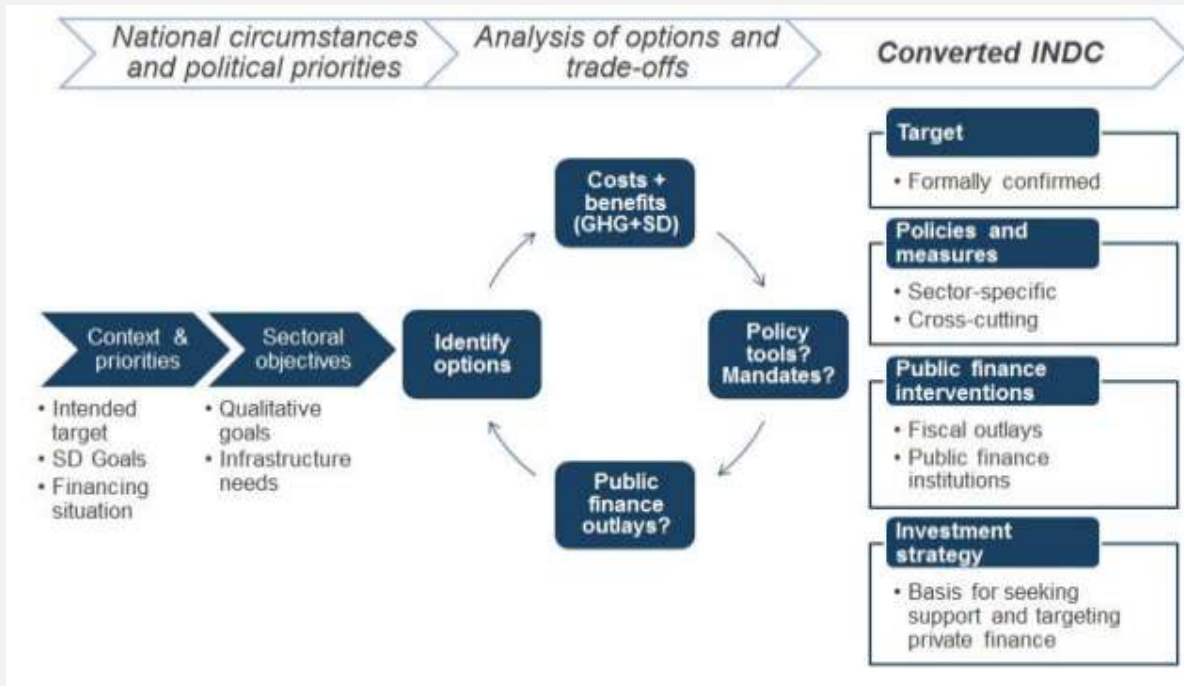
While setting priorities for converting the INDCs pledges into action, the EAC region should consider the following factors:

- The relative costs required, from both domestic and international support,
- The expected contribution to GHGs emissions reduction,
- Sustainable development benefits,
- The actions of other EAC partner states and those of the International Community, and
- The feasibility of policy actions and the level of domestic public resources required to achieve the identified measures.

¹⁶ <http://www.ccap.org/assets/Next-Steps-for-Converting-Inteded-Nationally-Determined-Contributions-into-Action-3.4.16.pdf>

¹⁷ Ibid

Figure 2: A Model of the INDC Conversion Process



Source: Center for Clean Air Policy (March 2016) Next Steps for Converting INDCs into Action <http://www.ccap.org/assets/Next-Steps-for-Converting-Inteded-Nationally-Determined-Contributions-into-Action-3.4.16.pdf>

Potential Positive Trade Impacts of EAC INDCs in the Region

Trade in the EAC region is mainly in commodity exports in agricultural products and minerals. Coffee, tea, cocoa, cotton, tobacco, sugar, and horticulture products are the main agricultural exports. Imports are predominantly petroleum products and capital goods from the European Union as it is the major trade partner of the region but there is a growing focus on Asia, particularly China and India. The United Arab Emirates (UAE) is the major transit hub for imports from Asia.¹⁸ Information on intra

trade is limited because of the dominance of informal trade. However, from the available data, Kenya, Uganda, and Tanzania dominate intra trade mainly in agricultural commodities i.e. coffee, tea, tobacco, cotton, rice, maize, and wheat flour, and manufactured goods such as, cement, petroleum products, textiles, sugar, beer, and salt.¹⁹

Implementation of the EAC INDCs is likely to spur trade opportunities for the region but could also pose negative effects on trade and trade related processes if not implemented in a holistic and sustainable way. The following are some of the likely trade opportunities that could

¹⁸ www.ecobank.com/upload/201310080459192956946Ubp43NNju.pdf

¹⁹ <http://www.theeastafrican.co.ke/business/Intra-EAC-trade-falls-to--5-63-billion--/2560/3255878/-/i26usj/-/index.html>

arise from implementing INDCs in the EAC region.

Creation of a trade-enabling environment

One of the key actions in the EAC INDCs is developing public infrastructure to facilitate implementation of INDCs. Public infrastructure plays a key role in trade facilitation because it can either facilitate or hinder the movement of goods and services. Well-developed infrastructure reduces the time taken to connect between regions and also integrates national markets and connects them at low costs to other economies.²⁰ Infrastructure development in developing countries is still a major challenge. In the EAC region where trade is largely in agricultural commodities and the majority of the population live in rural areas, developing public infrastructure is critical. About 80 percent of the population of the EAC partner states live in rural areas.²¹ Access to water, energy, roads and water transport play a pivotal role in the production processes of goods and ease movement of services in the region.

Development of infrastructure under the EAC INDCs is planned in the agriculture and energy sectors for adaptation and mitigation actions/purposes. However, these measures can also present trade opportunities for the EAC population that develop, increase or enhance trade.

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<http://www.adb.org/sites/default/files/publication/177093/adb-wp553.pdf>

²¹http://www.agriculture.eac.int/index.php?option=com_content&view=article&id=73&Itemid=117

Management of water resources

In all the EAC INDCs, management of water resources is to promote, irrigation in the agricultural sector and in doing so offset the effects of long droughts. It will also increase water resources that will be used to develop hydro energy that has numerous advantages for the manufacturing sector. For example, communities can take advantage of the expanded water resource to venture into industries that produce soft drinks for domestic and international markets.

Improving road infrastructure

Poor transport infrastructure or inefficient transport services are normally reflected in higher transport costs and longer time of delivery of products that increase the costs of trade.²² Increased costs of trade reduce market competitiveness at both the domestic and international levels. As a mitigation action, Rwanda through her INDC²³ plans to construct serviceable road and transport networks to reduce the GHG emissions caused by fossil fuels from vehicles. However, this will also make it easy for traders, especially smallholder farmers who live in rural areas to move their products to urban areas or within the region to get market.

Expanding the energy sector

The energy sector is a major challenge to the economic and social development of EAC member countries. Sufficient energy is the backbone of the manufacturing sector.

²²

https://www.wto.org/english/res_e/booksp_e/anrep_e/wtr04_2b_e.pdf

²³http://www4.unfccc.int/submissions/INDC/Published%20Documents/Rwanda/1/INDC_Rwanda_Nov.2015.pdf

However, the majority of EAC population do not have access to electricity, which is a major obstacle to the industry sector. Table 3 below shows the accessibility rates of electricity both

in rural and urban areas across the EAC region. Access to electricity in the rural areas is too low.

Table 3. Electricity access in the EAC region 2013

Country	Population (Million) 2014 estimates	Population without electricity (Million)	National electrification rate	Urban electrification rate	Rural electrification rate
Burundi	10.5	10	5%	28%	2%
Kenya	47.8 (2015)	35	20%	60%	7%
Rwanda	12.1	9	21%	67%	5%
South Sudan	11.7	11	1%	4%	0%
Tanzania	50.8	37	24%	71%	4%
Uganda	39.2	32	15%	55%	7%

Source: Based on IEA World Energy Outlook 2015

EAC partner states pledge to develop and improve the energy sector in their INDCs through promotion of clean energy technologies such as solar energy, hydro energy, biomass energy, geothermal energy, and wind energy. For example, Uganda through her INDC²⁴ plans to extend electricity to rural areas and expand the use of the off-grid solar system to promote irrigation and to discourage deforestation caused by use of wood fuel. Kenya, in her INDC²⁵, plans to expand geothermal energy, solar, and wind energy production and other renewable and clean energy options. Expanded and increased energy resources will also promote the manufacturing sector and power irrigation projects. This would cut down the costs of production in the

manufacturing sector and thereby help producers to remain competitive. In the agricultural sector, irrigation practices powered by the increased energy resources would increase crop productivity. Consequently, this would help farmers with stable incomes all year round.

Potential trade opportunities owing to improved infrastructure in the water, transport, and energy sectors include:

- Horticulture, which requires large amounts of water and energy for cooling plants;
- Production of soft drinks, which requires sufficient water;

²⁴<http://www4.unfccc.int/submissions/INDC/Published%20Documents/Uganda/1/INDC%20Uganda%20final%20%2014%20October%20%202015,%20minor%20correction,28.10.15.pdf>

²⁵http://www4.unfccc.int/submissions/INDC/Published%20Documents/Kenya/1/Kenya_INDC_20150723.pdf

- Trade in perishable fruits, especially for the rural farmers who currently lack energy resources.

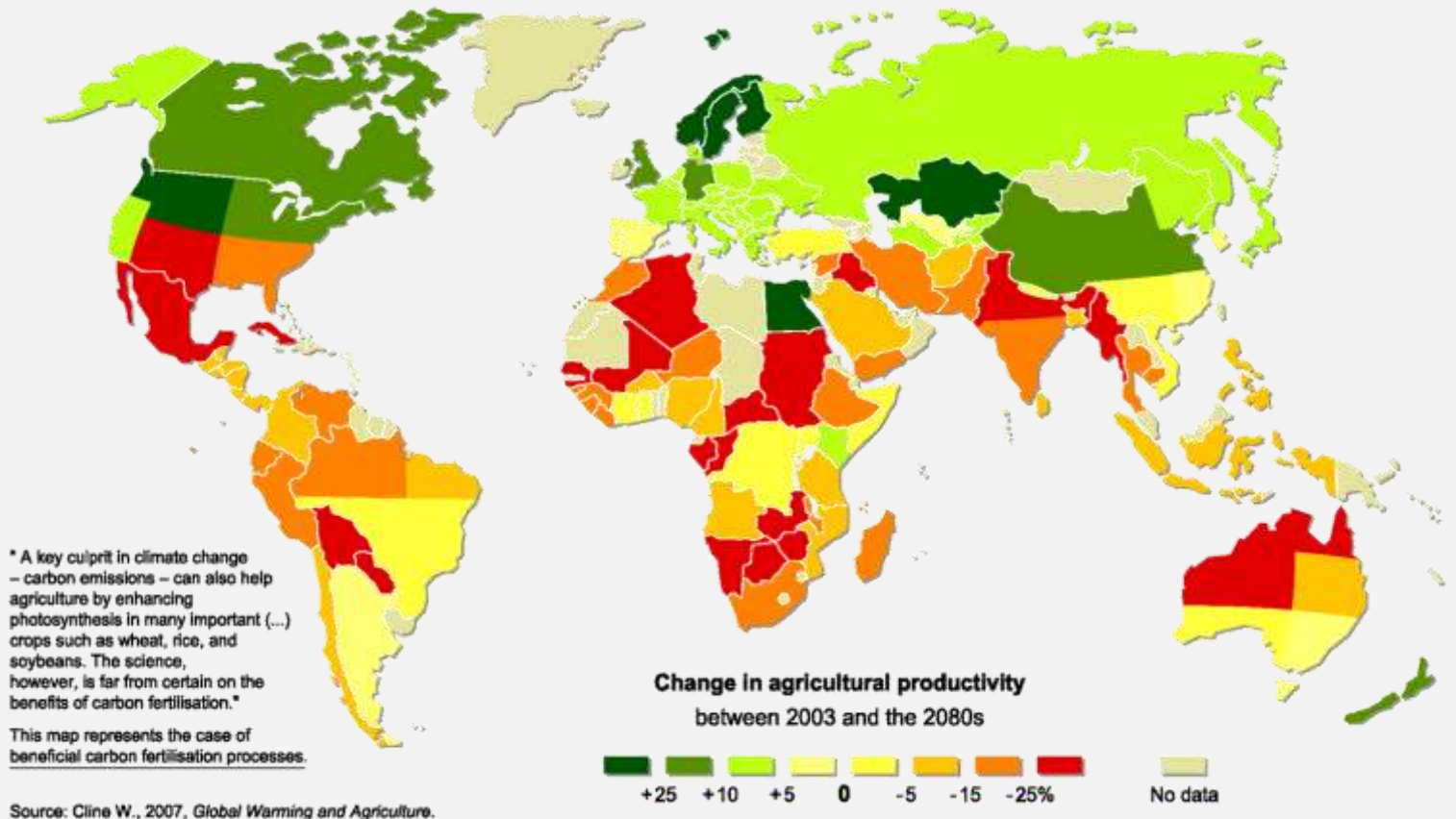
Increased production and output

🕒 Agriculture Sector

The agriculture sector is of utmost importance to the EAC region.²⁶ More than 80 percent of the population of the EAC depend on

agriculture for their livelihood, specifically rain fed agriculture, which is very vulnerable to climate change.²⁷ As a result, reduced rainfalls and unpredictable patterns, and prolonged droughts have led to decreased crop yields. This situation is expected to deteriorate if climate change is not addressed. No wonder that the biggest share of EAC INDCs actions target this sector, both adaptation and mitigation measures.

Figure 3: Projected Impact of Climate Change on Agricultural Yields by 2080



Source: European Environment Agency 2012, "Projected Impact of Climate Change on Agricultural Yields"
<http://www.eea.europa.eu/data-and-maps/figures/projected-impact-of-climate-change>

²⁶ Agriculture in this section includes; livestock, land use and land use change, and forestry.

²⁷ http://www.agriculture.eac.int/index.php?option=com_content&view=article&id=73&Itemid=117

According to the above figure 3, the EAC region's agriculture output will be among the worst hit by climate change over the period 2003 to 2080 with South Sudan being the most affected of the six partner states.

Actions or measures to address climate change (i.e. enhance resilience and reduce/prevent GHGs emissions) in the agricultural sector in the EAC INDCs could also work to increase the productivity of the sector. This would lead to increased output, which in turn presents trade opportunities and food security for the people of EAC region.

Improved infrastructure in the water and energy sectors will promote agricultural productivity. Long drought periods normally cause low yields for farm crops and affect livestock. With expanded water resources, communities in the EAC region can use sustainable farming practices to increase yields like irrigation, which is a major action in all the INDCs. This will promote commercial farming. Furthermore, with the use of irrigation, farmers engaged in subsistence farming will be able to get surplus that they can store and guard against food insecurity or sell in local markets to

improve their livelihoods. In addition, expanded energy sources will enhance agro processing industries and hence add value to agricultural products, which will increase their market competitiveness.

Apart from improved infrastructure, there are other planned actions in the EAC INDCs that directly target the agriculture sector for adaptation and mitigation purposes that can also increase animal and crop yields such as Climate-Smart Agriculture (CSA). According to the Food and Agriculture Organisation (FAO), CSA consists of three pillars:²⁸

- Sustainably increasing agricultural productivity and income;
- Adopting and building resilience to climate change; and
- Reducing or removing GHGs emissions.

CSA offers opportunities (as seen in table 4 below) that increase output leading to increased trade opportunities hence increased incomes, food security, and creation of jobs.

²⁸ Paul Neate (2013) Climate Smart Agriculture: Success Stories from Farming Communities around the World. Pure Impression : France

Table 4. CSA Practices that can Increase Yields

Soil and nutrient management	Nitrogen and other nutrients are essential for increased yields. Practices that increase the nutrients capacity of soils are; manure composting, intercropping, crop rotation, and agro forestry practices. Small-scale farmers do not take risks in investing in fertilisers and other inputs because they cannot afford doing so. Organic manure and better farming practices will help increase their yields. Burundi pledges to replace 100 percent of mineral fertilisers with organic fertilisers gradually. ²⁹
Water harvesting and use	Improved water harvesting and retention systems such as; pools, dams, pits, retaining ridges etc., and water use efficiency (irrigation) are all essential for increasing productivity by addressing irregular rainfall patterns
Control of pests and diseases	Climate change is altering the distribution, incidence and intensity of animal and plant pests and diseases through prolonged droughts and flooding. Controlling animal and plant pests and diseases ensures high returns. Rwanda pledges to promote sustainable pest management techniques such as, the use of stem borers and striga weed, push-pull system using <i>Napier</i> grass and <i>desmodium</i> legume to manage pests in maize, sorghum, millets, and rain-fed rice plantations. This will increase yields and enhance soil fertility.
Better plant and animal varieties	Adopting animal and seed varieties that are resistant to temperature extremes, drought, flooding, pests and diseases, increases crop and animal yields. Using improved animal and crop breeds will not only increase yields for farmers in EAC; it will also increase their competitive advantage in international markets.
Post-harvest mechanisms	Efficient harvesting, early transformation and storage of agriculture produce reduces post-harvest losses. The co-products and by-products can be used as livestock feed, to improve soil fertility, or to produce renewable energy in integrated systems.

Source: Based on FAO (2010) Climate-Smart Agriculture: policies, practices and financing of food security, adaptation and mitigation <http://www.fao.org/docrep/013/i1881e/i1881e00.pdf>

Climate-smart Agriculture: What Trade Opportunities?

Organic manure

The EAC region has potential for leveraging trade in organic manure. Farmers can make use of the animal and plant waste to produce organic manure, which they can sell in the

region or in international markets. Composting is one of the actions put across by the EAC partner states in their INDCs as both an adaptation and mitigation measure. Compost or organic manure is achieved through controlled decomposition of plant and animal materials (mainly animal) into a form that can

²⁹ http://www.unfccc.int/submissions/INDC/PublishedDocument/Burundi/1/Burundi_INDC_englishversion.pdf

be easily applied to the soil and used by plants.³⁰ This helps to improve the long-term soil fertility that is essential for adequate yields and can enhance the drought resistance of crops. As a mitigation measure, it locks carbon into the soil and prevents it from escaping into the atmosphere. It also reduces the use of synthetic fertilizers that are harmful to the environment. In countries where there is competitive advantage like S. Sudan, this can be turned into a trade opportunity. South Sudan has the highest percentage of livestock in the region.

Agro forestry

Agro forestry offers opportunities for the countries that have large areas of forestry land as well as those that lack adequate land for both forestry and farming. Countries that have large areas of land covered by forests can use the forest land for intercrop farming without having to clear the forests. The forests would serve as a mitigation measure for climate change while crop yields would increase the income of the population in those areas. On the other hand, countries that are faced with land scarcity would use agro forestry to maximise the benefits of both agriculture and forestry using the available small areas of land. According to

the Association for Temperate Agroforestry, agroforestry is the intensive land management system that optimizes the benefits from the biological interaction created when trees and/or shrubs are deliberately combined with crops and/or livestock.³¹ The benefits include increased output per tree/crop/livestock; productivity; and financial diversity and flexibility of the farming enterprises.³² More than half of Tanzania land is covered by forests (88 million hectares of land, of which 48.1m are forested).³³ In the EAC INDCs, the forestry sector is presented as a mitigation action to reduce GHG emissions through sequestration. As a mitigation contribution, Tanzania is a carbon sink. This large mass of forest also regulates the ecosystem in the EAC region. It also presents an opportunity for Tanzania to seize the benefits of agro forestry. In Rwanda and Burundi where land scarcity poses a challenge to the agriculture sector, agro forestry can be an essential option. It is one of the major actions in the agricultural sector in both the Rwanda and Burundi INDCs. For example, 100 percent of the households involved in agriculture production will be implementing agro forestry sustainable food production by 2030 according to the Rwanda INDC.³⁴

³⁰ International Trade Centre (2014) Mitigating Climate Change in the Tea Sector

³¹ <http://www.aftaweb.org/about/what-is-agroforestry.html>

³² Ibid

³³ Tanzania INDC

<http://www4.unfccc.int/submissions/INDC/Published%20D>

ocuments/United%20Republic%20of%20Tanzania%E2%80%8B/1/INDCs_The%20United%20Republic%20of%20Tanzania.pdf

³⁴http://www4.unfccc.int/submissions/INDC/Published%20Documents/Rwanda/1/INDC_Rwanda_Nov.2015.pdf

Table 5. Trade opportunities for EAC in Agroforestry

Alley Cropping	This system combines trees planted in single grouped rows with crops such as horticultural crops.
Forest farming	This practice utilizes forested area for producing specialty crops for example for medicinal, ornamental or culinary uses such as ginseng, decorative funs, and mushrooms. Other examples are; fodder, such as <i>calliandra</i> , <i>calothyrsus</i> , and <i>leucaena trichandra</i> , which can be used as feed for stall-fed diary, to increase milk production, and provide forage for honey production. Gum trees can be planted in forest reserves to act as buffer plantations.
Multi-layer forest gardens	They combine a permanent over story of tall trees, a lower canopy Fruit and multipurpose trees and understory of shrubs and herbaceous plants for a variety of products for sale and subsistence.
Bush fallowing	It is a system of farming where the land is left for some time without cultivating it with the aim of restoring the soil fertility. The use of gum arabic in the fallow period is both economically rewarding and ensures soil sustainability. Gum trees are grown on the abandoned farm plots during the fallow period, during which they improve the soil fertility thereby ensuring adequate crop production when cultivation is resumed. ³⁵
Temporary practices	Agro forestry can also be used only for a limited period as part of a farm or forest management. For example, to generate income from grazing during the early years of a long rotation tree plantation.

Source: Based on, Association for Temperate Agroforestry "Agroforestry opportunities" <http://www.aftaweb.org/2-uncategorised/35-agroforestry-opportunities.html>, And "State of orld's Forests" (2005) Realising the economic benefits of agroforestry: experiences lessons and challenges <ftp://ftp.fao.org/docrep/fao/007/y5574e/y5574e09.pdf>

Increased Manufacturing

The manufacturing or industrial sector is powered by energy. Inefficient energy supply is a challenge for the EAC region and has held back the region's economic development. As one of the priority sectors in all the EAC INDCs, increased energy coupled with technology development and transfer from developed countries as part of their support for developing countries will help trigger widespread manufacturing and industrialisation in the EAC region. For the EAC region, which depends on agriculture production, this is an opportunity to

add value to agricultural products through agro processing. Table 6 appendix B (see bottom of document) shows the potential trade opportunities for SMEs in Agro Processing.

Waste management is one of the key actions in the EAC INDCs, especially in Tanzania's INDC. The country pledges to:³⁶

- Apply modern and practical ways of managing waste including the enhanced use of engineered/sanitary landfills.
- Promote waste to energy programs like waste water reuse and recycling technology

³⁵ <http://www.fao.org/docrep/w3735e/w3735e22.htm>

³⁶ http://www4.unfccc.int/submissions/INDC/Published%20Documents/United%20Republic%20of%20Tanzania%E2%80%8B/1/INDCs_The%20United%20Republic%20of%20Tanzania.pdf

- Promote co-generation activities.

Kenya pledges to promote and implement sustainable waste management systems. In addition to contributing to climate change adaptation and mitigation, opportunities exist in the waste management sector whereby waste material can be reprocessed to create new products.³⁷

- Scrap metal depot: waste metal from places like factories can be used to produce nails, roofing sheets, pots and cutleries.
- Rubber waste recycling: rubber can be melted to form new products. Discarded rubber shoes, slippers, buckets, jerry cans are used to make tires or plastic chairs, and tables.
- Paper recycling: In this business, waste paper is turned into tissue paper.
- Used clothes: products such as foot mats, mattresses and cushions can be obtained from used clothes.

International Market Mechanisms

To help developed countries meet their GHGs emission targets, and to encourage the private sector and developing countries to contribute to emissions reduction efforts, three market mechanisms were included in the Kyoto Protocol, namely Emissions Trading System (ETS), Clean Development Mechanism (CDM), and Joint Implementation (JI).³⁸ These market mechanisms' principle is that the benefit to climate change by reducing GHGs emissions is

the same regardless of the location where they are reduced.

Moreover, the "Paris Agreement" established a new market mechanism to assist Parties in achieving NDCs, raising ambition and supporting sustainable development. The exact rules of the mechanism are yet to be made.³⁹ According to Carbon Pulse⁴⁰, the new carbon trading provisions are under article 6 of the "Paris Agreement". They are open to developed and developing countries alike meaning that signatories can be buyers or sellers of emissions units, which will now be called "Internationally Transferred Mitigation Outcomes" (ITMOs). In the meantime, EAC countries will take advantage of the market mechanisms under the Kyoto Protocol that are most applicable to developing countries as noted in some of the INDCs, specifically CDM.

Clean Development Mechanism

The provision for CDM is under article 12 of the Kyoto Protocol. Under this mechanism, emission-reduction projects based in developing countries can earn Certified Emission Reduction Credits (CERs), which can be traded and sold to industrialised countries to meet a part of their reduction targets under the Kyoto protocol.⁴¹ EAC partner states pledge in their INDCs to take advantage of this mechanism by developing or building upon existing projects to expand their financial resources that are crucial for both economic development and addressing climate. EAC partner states and big firms have opportunities

³⁷ <http://www.mytopbusinessideas.com/waste-management/>

³⁸

http://unfccc.int/press/news_room/newsletter/in_focus/items/4553.php

³⁹ <https://newclimate.org/expertise/market-mechanisms/>

⁴⁰ <http://carbon-pulse.com/13339/>

⁴¹ <http://www.cdm.unfccc.int/aboutcdm>

in reforestation projects, gazettement wetlands, as well as production and sale of carbon stoves. Opportunities also exist for SMEs, especially smallholder farmers. Referred to as “carbon farming”, farmers can earn credits by implementing practices that sequester carbon. Farmers can then sell the credits to individuals or businesses that need to offset the GHG

emissions of their operations.⁴² Trading in carbon credits encourages sustainable development and at the same time offers the local communities a chance to get the much-needed extra income. In Kenya where CDM has already taken root, the returns from CDM projects have improved the livelihoods of the communities.

A CDM project in Kenya

Kenya Agriculture Carbon Project (KACP) signed the Emissions Reduction Purchase Agreement (ERPA) with the World Bank's Bio Carbon Fund. The project is dominated by subsistence farmers and is implemented by Vi Agroforestry (Swedish NGO). Farmers adopted Sustainable Agriculture Land Management (SALM) practices like; reduced tillage, use of cover crops, and green manure, mulching, target application of fertilisers, and agroforestry. Vi Agroforestry sells the GHG gains to the Bio Carbon Fund. The revenue from the carbon credits is distributed between farmer groups (60 percent) and Vi Agroforestry (40 percent). By 2013, some 15,000 farmers in 800 groups had adopted SALM. It is estimated the project will bring direct benefits of US dollars 350,000 to local communities. Payments from the Bio Carbon Fund will provide additional income to participating farmers until 2025.

Source: Paul Neate (2013) Climate Smart Agriculture: Success Stories from Farming Communities around the World

Likely Negative Impact of EAC INDCs on Trade Potential

Adaptation and mitigation measures in the EAC INDCs may in addition to creating trade opportunities for the EAC region also hinder trade or create an environment that may not be favourable for trade.

Land Scarcity

Reforestation and gazettement of wetlands are mitigation actions in all the EAC INDCs. However, land is the major factor of production in the agriculture sector. The biggest percentage

of the EAC population depends on agriculture for their livelihoods. In addition, agricultural products dominate in trade at both the international and regional level. Setting aside large trunks of land will reduce the available land for agriculture and hence affect production output for communities. With the increasing number of populations in the region, land scarcity could become a challenge for trade in agricultural products. Moreover, agricultural practices that require small portions of land such as zero grazing and garden farming are expensive for most of the rural populations. One of the solutions is to promote agro forestry as discussed above.

⁴² Paul Neate (2013) Climate Smart Agriculture: Success Stories from Farming Communities around the World. Pure Impression : France

Deposed Sources of income

A big percentage of the population of the EAC depends on forests and wetlands for their livelihood. They derive incomes from trade in timber, woodcrafts, wood fuel, charcoal, and handicrafts. When done in an unsustainable manner, trade in timber, woodcrafts, and handicrafts leads to deforestation. The use of wood fuel and charcoal contributes to GHGs emissions. With increased restrictions on forests and wetlands as planned in the EAC INDCs, these communities will not have sufficient raw materials for their businesses and could soon get out of business losing their source of income and livelihood.

INDCs are dependent on international support

Successful implementation of INDCs will largely depend on international support. For example, 70 percent of the Uganda INDC actions are conditional targets meaning that their implementation is subject to international support. Yet this support is not guaranteed and may not be sufficient. However, the EAC countries have already pledged to implement the INDCs, which emphasise the clean development path. Given the developmental needs of the region, implementing INDCs without sufficient and predictable support will hinder manufacturing and industrial development. This will be an obstacle to trade in manufactured goods and overall economic development of the region.

Controversy over Climate Smart Agriculture

There is controversy on what can and cannot be included in CSA. Industrial processes that

increase greenhouse emissions, using genetically modified seeds, increasing synthetic fertiliser use or intensifying industrial livestock production can all use the “climate-smart” label to promote their products. The world has become more aware about climate change issues and consumers are more conscious about it in their product selection. EAC partner countries may lose out in international markets where consumers are more climate conscious.

Conclusion

To the economies of EAC partner states, implementing INDCs will be equivalent to “killing two birds with one stone.” On one hand, to achieve the Paris Objectives, EAC INDCs actions will work as mitigation contributions to achieve the objective of the UNFCCC convention while at the same time working to help the countries adapt to the negative impacts of climate change. On the other hand, these actions will present enormous opportunities for economic transformation through trade and sustainable development practices enhanced by financial support, capacity building, and technological development and transfer from developed countries, as pledged during the “Paris Agreement” negotiations.

Recommendations

Refining the INDCs

Although there is a challenge of lack of clear guidelines on what to include in the INDCs, EAC countries will need to redefine their INDCs to include implementation strategies of the actions set out in the various priority sectors. There is a need to document how

targeted measures will translate into actual actions.

Regional dialogue

EAC countries should harness policies and implementation of the INDCs. The EAC secretariat could come up with a working EAC INDC that reflects all the priority sectors and actions set out in the individual partner states' INDCs. This will for example, help in managing actions on shared resources like Lake Victoria, River Nile, and Lake Tanganyika.

Maximise financial opportunities

Implementation of the EAC INDCs will depend on domestic and international support. The partner states will addition to allocating resources for INDC implementation from national budgets, also create alternative sources such as taxation and INDCs Funds. Resources for INDCs Funds could come from such avenues as the extractives sector. The biggest percentage of implementation of EAC INDCs will depend on external support hence partner countries need to maximize sources of financial support including sources such as development Banks. The EAC secretariat could come up with a database of potential sources of funding for the partner states.

Creation of a conducive environment

The EAC partner states need to provide a regulatory and economic environment that will encourage the private sector to invest in green projects of the priority sectors. Governments should enhance the human and institutional capacities of public and private stakeholders to facilitate the implementation of INDCs.

Monitoring and evaluation strategies

Monitoring and evaluation strategies and institutions need to be developed to track the implementation of INDCs. In this regard, EAC partner states should endeavour to determine whether the actions set out in the priority sectors are working to reduce the emission of GHGs as set out and measure the impact of adaptation actions. Efforts should also be made to measure the negative impacts of INDCs on some sectors like the extractives sector (for those countries that have the oil and gas resources) since it is vital to economic development.

Mitigate negative impacts

The EAC governments should put in place alternative options for the local communities whose livelihoods depend on sectors that will be affected by the implementation of actions in the INDCs such as; wood fuel traders, charcoal trades, timber traders, wooden crafts, and woven handicrafts.

Involve stakeholders in implementation

Just as most of the stakeholders were involved in the development process of the INDCs, they should also be involved in the implementation process. EAC countries should come up with guidelines on the expected roles of the various stakeholders in the implementation process.

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Appendix A

Table 1. Overview of the EAC INDCs

Country	Priority sector (mitigation)	Priority sector (Adaptation)	Means of implementation	Target year	Baseline year	Policy anchor
Burundi	Agriculture, Forestry, and Other Land Use (AFOLU), and Energy	Agriculture and Livestock Energy, Forestry, and Water	Capacity building, financial assistance, technological transfer, and mainstreaming gender, youth and vulnerable groups into INDC policy	2030	2005	First and second national communication on climate change (2001&2010), NAPA43 2007, NCCP44 2012 National Strategy and Action Plan on Climate Change (2013)
Kenya	Energy, Transport, Industrial Processes, Forestry, Agriculture, and waste management	Energy, ALF45, Health, Environment, Water and Irrigation, Tourism, Gender Youth Vulnerable groups and Youth, Science and Technology innovations, Public sector reforms, Infrastructure and land reforms, Education, and training	Domestic and International Support, finance and investment, technology development and transfer, capacity building	2030	2010	National Climate Change Action (NCCAP 2013) National Adaptation Plan (2012)
Rwanda	Energy, Transport, Industry, Waste management, Forestry	AFOLU46, Waste Management, Water, Energy, Tourism	Institutional arrangements, finance, capacity building, knowledge management, technology, innovation and infrastructure, integrated planning and data management	2030	Not explicit	National Strategy for Climate Change and Low Carbon Development Strategy (2011)
South Sudan	Energy Land Use and Land Use Change, Transport	AFOLU and Livestock, Health, water management, Infrastructure	Domestic and International Support, finance and investment, technology development and transfer, capacity building	2030	2016	Environmental Policy Framework, Parallel development with the National Adaptation Program of Action (2015)
Tanzania	Energy, Transport, Forestry,	Agriculture and Livestock, Coastal Marine Environment & fisheries,	Adequate and predictable financial resources, technology development and	2030	2000	National Climate Change Strategy (2012), Zanzibar Climate Change

43 National Adaptation Programme of Action (NAPA)

44 National Climate Change Policy (NCCP)

45 Agriculture, Livestock, and Fisheries (ALF)

46 Agriculture, Forestry and other Land Use (AFOLU)

	and Waste management	water resources, forestry, health, tourism, human settlements, and energy	transfer, Institutional capacity building			Strategy (2014)
Uganda	Energy, Forestry, Wetland, and Agriculture	Agriculture and livestock, Forestry, Infrastructure (human settlements and transport), water, energy, health, disaster risk management	Capacity building, technology transfer, finance, mainstreaming gender and human rights in climate change adaptation and mitigation actions	2030	2000 (only for Land Use and Land Use Change and Forestry)	National Climate Change Policy 2015 and its costed implementation strategy, National Development Plan (2010/11-2015/15)

Source: Derived from EAC partner states INDCs INDC Portal

Appendix B

Table 6. Potential Trade Opportunities for EAC SMEs in Agro Processing

Agricultural product	Agro processing
Maize and millet	Milling and flour packaging Production of by-products like packed snacks
Ground nuts/pea nuts Simsim/sesame	Processing pea nut butter, and processing of sesame oil
Wheat	Milling and flour packaging
Sorghum, Soy bean, and Sun flower	Brewery and processing of oil
Banana	Banana wine processing, drying and grinding into powder form
Sisal	Spinning and weaving to get products like handicrafts, sisal mattresses, and buffing cloth for polishing metals in industrial settings, production of alcohol, particle boards, citric acid, and pulp factories.
Sugar	Use of bagasse for electricity generation, production of charcoal briquettes, writing paper and particle board. Use of molasses for ethyl alcohol production, vinegar and acetic acid production, livestock feeds, rectified spirits, rum and yeast
Pyrethrum	Processing of pyrethrum insecticides and pesticides, paints,
Tobacco	Curing barns and furnaces, production of fertilizers, insecticides and sprays
Gum Arabic	Production of paint, glue, cosmetics, printing products, chewing gum, and candles
Apiculture	Production of honey, pollen and brood, bees wax, candles, lubricants, and royal jelly

Livestock	Leather processing Meat processing and its by-products. Processing of dairy products: Ultra-Heated-Treated (UHT)milk, powdered milk, cheese, butter, yoghurt, ice-cream, flavoured, and condensed milk
Poultry	Development of hatcheries for production of chicken, boiler processing plants, and production of chicken feeds.
Fisheries	Fish processing and fish by-products processing

Source: Jim Kabeho. Business Opportunities in East Africa; Exploring Agro Processing and Value Addition Potentials.



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