

Bioeconomy, Agri-food Systems and Agricultural Sustainability: Insights from Eastern Africa

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Introduction

Bioeconomy, a global promising potential is being recognized in policymaking in many countries (Kircher, 2019). The realm of bioeconomy of the Eastern Africa region is mainly on the innovative, optimal, novel, and sustainable utilization of biomass and biological resources produced from agriculture, aquaculture, bioprospecting, forestry and substitutes of food, feed, health, bioenergy and ecosystem service. The Eastern Africa region—in this case, Burundi, Ethiopia, Kenya, Rwanda, Tanzania, Uganda and South Sudan— does not have a clear-cut bioeconomy policy or strategy, however, their national development plans and other closely related policies and strategies identify bio-economy related sectors as key to economic development. Food and agriculture (agrifood) in the world stand at \$7.8 trillion industry, accountable for over 40% of labor force and accords approximately a third of world's GHG emissions (solely by agriculture) (FAO, 2016). The demand for agri-food products is estimated to rise substantially due to population growth, income growth, and associated dietary transitions (Alexander et al, 2015). Similarly, the call for adjusting to climate change, additional demand for the supply of industrial raw materials and energy are the foreseeable constraint that the sector will experience. To address these needs feasibly, more strain will be put on the agri-food sector to supply raw materials and food from the inadequate natural resources while sustaining environmental quality. Figure 1 shows the bioeconomy-agriculture linkage that encompasses several aspects and innovation, functionalities and facets of commodities.

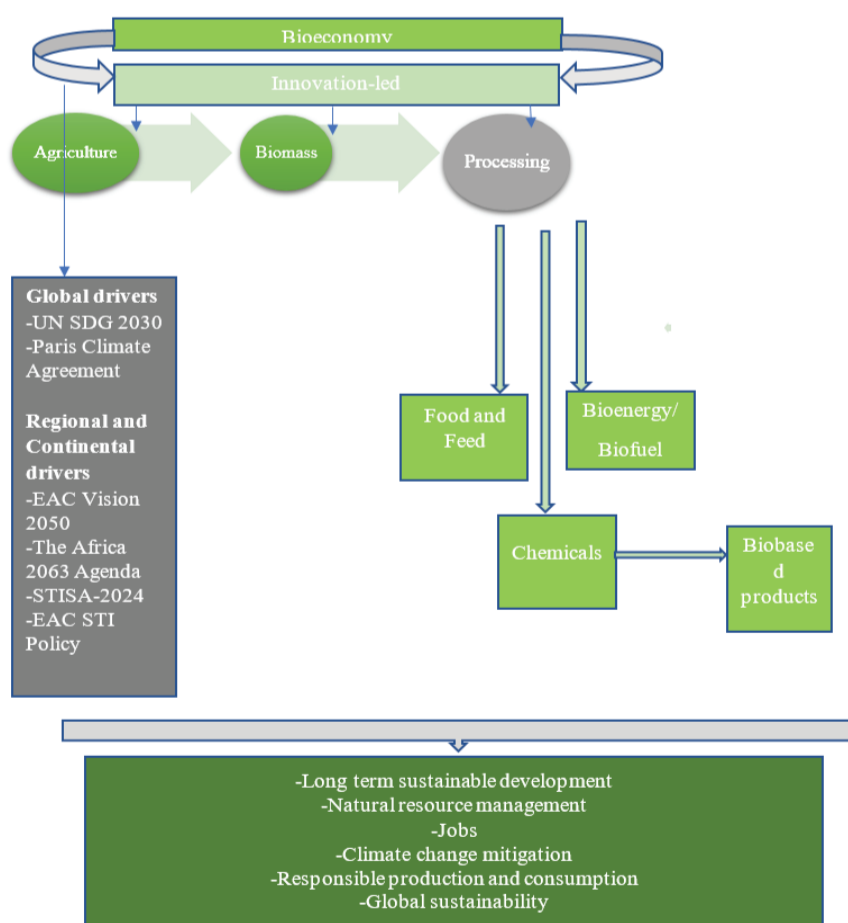


Figure 1: Bioeconomy-Agriculture linkage | Source: Authors' conceptualization

Methods

Mixed methods and processes were adopted. The discussion is based on a review and assessment of available databases, reports and scientific literature and inputs from a highly participatory and consultative stakeholder engagement.

Results

Enhancement of food safety and the promotion of consumer health and healthy diets is crucial in bioeconomy as it is anticipated to bring a considerable contribution to the food industry

The global market for novel functional food, feed additives and nutraceuticals, edible and essential oils and industrial oils is also fast-growing. Alternative food resources like algae and insects are also identified as promising to meet future demand for protein supply. Advances in bioeconomy may exploit such alternative food sources and their usage as protein sources in the food and feed industries

The region is still a low player in global trade, with a small share of the world's agricultural exports, most of which are in their unprocessed form.

Agricultural production offers inputs for the food processing sector, recycles many by-products not only from the sector but also from other sectors in the form of nutrients applied to the soil or animal feed. These inputs and their byproducts are equally useful input for other non-food industries to produce bioenergy, materials and chemicals

Developing bioeconomy is essentially seen as offering viable opportunities for the agricultural sector as well as opening up new markets, new income streams and jobs, diversifying farm activities and developing linkages to new businesses and sectors, cost reduction through efficient utilization of resources and optimal usage of waste resources as well as lowering risk exposure from commodity prices or alteration in policy by embracing more resource-efficient business models.

Conclusion

- Developing a bioeconomy in the Eastern Africa region offers a promising potential of lowering fossil resource dependence and addressing the needs of a rapidly growing population.
- Emphases on agriculture's central role as a biomass producer for food, feed and energy cannot be underestimated.
- Sustainable agri-food systems for the region have to meet the drawbacks of increased biomass production while lowering the negative environment effects.
- Establishing strong agricultural value chains for diversification of commodities could lower susceptibility and cushion the effects of varying commodity prices.
- Expedited growth of value addition in agri-food production will be critical in attaining the Eastern Africa's ambitious developmental goals and addressing the bottlenecks of managing and converting agro-industrial waste into valuable products for widening economic activities in an environmentally friendly
- Investment in human resource development, R&I, access to markets, technology adoption, support of small holder farming, protection of natural resources, development of supportive policies are some of the key strategies that the countries in the Eastern Africa region will need to put in place to ensure success of bioeconomy.

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