



THE EAST AFRICAN REGIONAL BIOECONOMY STRATEGY

A summary

Key messages

The development of a modern bioeconomy in Eastern Africa has significant potential to support several critical development goals and targets for the region

-Value addition to bioresources is at the centre of the Bioeconomy, where value can be added to primary produce creating innovative and novel food, feed, fuel, and health products and biomaterials.

-Converting biowaste and agricultural residues into useable products is also a central part of the bioeconomy, improving the efficiency of the agro and bioprocessing industries in the region and providing feedstock for novel biobased products.

A regional bioeconomy strategy for Eastern Africa can support regional collaboration and harmonised policies, strategies, regulations and standards for biobased products, facilitating trade and economies of scale and concerted actions to build capacity in key areas of the Bioeconomy.

The core objectives of the strategy are to support

- Food and nutrition security* through improving farm profitability/productivity and ability to produce nutritious food products
- *Health*, through development of biobased drugs and vaccines to address key health problems in the region
- Rural and urban livelihoods and creation of new jobs* through the development of new biobased value chains and bioprocessing of primary produce and biowaste
- The Environment*, through reducing Green House Gas emissions, reducing biowaste and protection of vital ecosystem services

In order to realise the promises of a modern biotechnology, countries in the region need to develop an enabling environment, where strategic capacity building, partnerships, business incubation, financing mechanisms and supportive policies are key

Bioeconomy Development – An Opportunity for Eastern Africa

In the face of rapid population growth, policy makers in Eastern Africa like the rest of Africa, are confronted with the urgent need to increase the rate of economic growth, create new jobs, and provide opportunities for youth and women. At the same time there is the pressing need to protect the environment and ecosystem services and ensure resilience in the face of emerging threats such as climate change and diseases. Long-term economic prospects for the region are also tied to the ability to increase trade in the domestic, regional, and global realms.

The promotion of a bioeconomy is highly placed on the political and business agenda for many countries globally, as a major strategic driver for the transformation of biobased sectors for sustainable economic growth and development. A central feature of the bioeconomy is that *scientific research, knowledge and innovation can be applied not only for the production of food, feed, fibre and fuel but also to produce a wide range of agro-industrial and value-added products*. Another critical



element of the bioeconomy is *to build value around local bioresources*, maximising and using all parts of primary produce and their products.

Bioeconomy growth offers an opportunity for countries in Eastern Africa to achieve many of the Sustainable Development Goals, making use of the region's abundant natural resources, including under-utilised agricultural waste materials, to produce value added products with applications in many sectors including food, health, energy and industrial goods, thereby creating jobs, generating wealth, and connecting smallholder farmers to new biobased value chains.

The Bioeconomy Development in EAC Context

The East African Community (EAC) lays emphasis on developing policies and programs aimed at widening and deepening co-operation among the Partner States. Specifically, Article 5 (1) of the Treaty states the objectives of the Community as: "to develop policies and programs aimed at widening and deepening co-operation among the Partner States in political, economic, social and cultural fields, research and technology, defense, security and legal and judicial affairs, for their mutual benefit." To attain these objectives, the Partner States committed themselves to establish a Customs Union, a Common Market, a Monetary Union and ultimately a Political Federation. These institutional arrangements are expected to promote balanced development and equitable distribution or sharing of economic benefits arising out of economic and political integration.

The East African region stands at a critical turning point in its socio-economic transformation and development. The improved performance of the GDP over the last decade has raised the aspirations of East Africans and sprouted renewed interest for investment in the region. The EAC Heads of State are determined to implement the necessary agenda as enshrined in EAC Vision 2050 to fulfil the rising aspirations and the continental and global expectations. However, such regional ambitions can only be attained on the wheels of a solid base of Science, Technology and Innovation (STI). This is because STI which is a key driver of socioeconomic development is essential for the growth and competitiveness of national economics in the 21st century and helps to solve a range of economic and social problems faced by nations today. This is the resounding lesson from the advancement of the industrialized and newly industrialized countries.

Eastern Africa's economies are among the fastest growing in the world, with technological change sweeping across the region and offering many new opportunities. Countries in the region share many of the same bioresources, have the same type of agro-ecological conditions and the same type of agro- and bio-industrial platforms. There is a positive current trend for harmonization of policies and strategies in the region under the East African Community, which can facilitate a regional approach to bioeconomy development. Transformative regional integration, collaboration and concerted action in the region can support countries to move towards modern sustainable bioeconomies. Collaboration is possible in many areas including; aligning and harmonising policy and strategies promoting innovation and trade; harmonisation of regulations and standards for biobased products, facilitating trade and economies of scale; collaborative capacity building in key areas of the Bioeconomy, through building regional competence platforms and knowledge sharing mechanisms; and jointly increasing the attractiveness of the region for investments, both from within the region and from foreign investors in biobased industrial development.

This Regional Bioeconomy Strategy provides a compelling framework for putting in place agreed goals and interventions which countries in Eastern Africa can use to achieve the continental aspiration of integrating its *Agenda 2063 and the UN 2030 Agenda for Sustainable Development* into intersectoral national development plans, and the regional aspiration contained in *EAC Vision 2050*, in which

Member States aspire to become middle-income countries. This strategy builds upon existing national and regional science, technology, and innovation (STI) policies and related instruments aimed at creating an enabling environment for increased STI investments to support sustainable development and socio-economic transformation. Moreover, the strategy is aligned with expressed commitments to environmental sustainability, climate change adaptation and mitigation, reversing or changing unsustainable practices. This is the context that underpins the need for a regional bioeconomy strategy, which responds to the challenges, and opportunities

What development of the bioeconomy can bring to countries in Eastern Africa

The development of a modern bioeconomy in Eastern Africa has significant potential to support several critical development goals and targets for the region, and will help deliver the following outcomes:

- **Sustainable industrialisation, job creation and green growth**, revitalising bioprocessing and biomass value chains in the region, and promoting circular economy production systems with reduced emissions, through productive and efficient use of biowaste.
- **Improved food security** through enhanced value chains and processing, promoting a more secure and resilient food supply while contributing to *sustainable, healthy, affordable and nutritious food* for the growing population in the region.
- **Improved health**, using the biodiversity in the region to develop cost effective biobased production systems for various biopharmaceutical products for treatment that address specific health challenges in the region (HIV, malaria etc).
- **The creation of new biobased products**, including biomaterials for construction, bio-inputs for agriculture, enzymes for industry, and biobased feedstocks (e.g. biofertilizers, bio-packaging) to substitute products derived from petrochemicals (or to satisfy growing demands from consumers (e.g. functional foods, special dietary needs, novel health and well-being products).
- **Linking farmers and bio-entrepreneurs to market opportunities** and to local, national, regional and international markets. New biobased value-added products attractive on a world market can assist the private sector in Eastern Africa to expand and improve their global competitiveness and stimulate sustainable economic growth.
- **Creating new forms of clean sustainable modern bioenergy**, such as biofuels, for transportation and electricity generation from biowaste and industrial by-products mitigating climate change and massive use of fuelwood that leads to deforestation.
- **Protecting the environment** through converting waste, which today threatens ecosystems and freshwater resources, to useful products.

Why a regional Bioeconomy strategy?

With a few exceptions, Eastern Africa's economies are among the fastest growing in the world, with technological change sweeping across the region and offering many new opportunities. Countries in the region share many of the same bioresources, have the same types of agro-ecological conditions and the same types of agro- and bio-industrial platforms. There is a positive current trend for harmonisation of policies and strategies in the region under the East African Community (EAC), such as the EAC Customs Union and the Common Market Protocol, which can facilitate a regional approach to bioeconomy development. Transformative regional integration, collaboration and concerted action in the region can support countries to move towards modern sustainable bioeconomies. Collaboration is possible in many areas including:

- Aligning and harmonising policy and strategies promoting innovation and trade
- Harmonisation of regulations and standards for biobased products, facilitating trade and economies of scale

- Collaborative capacity building in key areas of the Bioeconomy, through building regional competence platforms and knowledge sharing mechanisms
- Jointly increasing the attractiveness of the region for investments, both from within the region and from foreign investors in biobased industrial development

Bioeconomy in the Regional Context of Eastern Africa

The economies of countries in the Eastern African region are mainly agri-based and according to World Bank data over 30% of the region's GDP is currently directly attributed to agriculture and other bioeconomy related sectors. Countries in the region have rich but largely unexplored biodiversity, and a strong bio-resource production base. However, the region has only to a limited degree, been able to apply technologies and know-how that could modernise agricultural production, bioprocessing and value addition. The low degree of bioprocessing and value addition to primary produce makes it difficult for the region to use its bioresources as an engine for economic growth.

Encouragingly enough, rural Eastern Africa offers opportunities for expansion of biomass production that would create value addition at negligible opportunity cost by improving degraded or poorly maintained lands. The region has increasingly supported stronger universities, research institutions and innovation capabilities, with a growing number of active and well-trained scientists. In addition, all the countries in the region have embraced or are piloting different tools, agro-based clusters and platforms to promote agro-industrial development, which will serve as a base for expansion of biobased business enterprises.

There are, however, generally still weak linkages between researchers and industry. Funding and financial systems to support the innovation chain through all the stages from research and development to the market are also still weak. To date, and as a consequence of the above, there has been insufficient development of industrial capacity relevant to the bioeconomy.

Inadequate business incubation, financing resources and lack of venture capital severely hamper industrialisation, expansion of biobased production, small and medium enterprise (SME) growth and job creation. Inadequate systems for standard setting, certification and accreditation of products limit trade of biobased products and make it difficult for private sector actors to meet regulatory requirements and access markets in developed countries.

Strategic direction

The development of the EAC regional strategy has been a highly consultative process spearheaded by EASTECO and with a series of national and regional consultative meetings where pertinent stakeholders participated in its development. The countries participating in the development process have been **Burundi, Ethiopia, Kenya, Rwanda, South Sudan, Tanzania, and Uganda**

This Strategy focuses on the creation of new biobased products that add value to bioresources in the region and/or use bioresources in novel, innovative and sustainable ways. Specifically, the scope of the strategy covers optimisation and innovative use of biomass and biological resources produced from agriculture, aquaculture, bioprospecting, and forestry and includes alternative sources of food and feed, health and bioenergy products.

Vision

A vibrant, inclusive and innovative bioeconomy contributing to sustainable economic growth and job creation in Eastern Africa



Mission

To catalyse and support innovative and sustainable use of bioresources as a major driver of inclusive economic growth and job creation in Eastern Africa.

Core objectives

The core objectives of the strategy are to support:

- *Food and nutrition security* through improving farm profitability/productivity and ability to produce nutritious food products.
- *Health*, through development of biobased drugs and vaccines to address key health problems in the region.
- *The Environment*, through reducing GHG emissions, mitigation of climate change, reducing biowaste and protection of vital ecosystem services.
- *Rural and urban livelihoods and creation of new jobs* through the development of new biobased value chains and bioprocessing of primary produce and biowaste.

These objectives will be achieved through, *inter alia*:

- *Regional and international collaboration* sharing knowledge and building capacity.
- *Promoting regional markets* for biobased trade.
- A harmonised regional approach to create structures *for innovation and deployment* of technologies and know-how for value addition to primary produce and biowaste.
- Development of *national bioeconomy strategies and policy agendas* in the region.
- *Joint monitoring and information* sharing of bioeconomy development, such as a regional Bioeconomy Observatory.

Strategic Thematic Areas

Four priority Strategic Thematic Areas (STAs) form the core of this Strategy (see below): The Key Result Areas (KRAs) within each of the four STAs are also summarised below.

Strategic Thematic Area 1: Food security and sustainable agriculture

The goal of this STA is to *strengthen food and feed production, ensuring food security, through the introduction of new biobased technologies and solutions*. It has three KRAs:

- **Value addition to food crops, livestock, and microbial products:** To deliver economic growth and provide opportunities for smallholder farmers and SMEs by adding more value to primary produce and the use of agricultural residues.
- **Novel food and feed products:** To produce a variety of novel and healthy food and feed products for growing local, regional and international markets improving rural livelihoods, farm profitability and supporting food security
- **Biobased agricultural inputs:** To support and enhance sustainable agricultural production through the growth of bio-based agricultural inputs (e.g. biopesticides and biofertilizers) produced in the region.

Strategic Thematic Area 2: Health and Wellbeing

The goal of this STA is to *build a biobased healthcare sector that addresses regional health priorities and builds on traditional knowledge*. It has three KRAs:

- **Biobased pharmaceuticals:** To strengthen bioprospecting and innovation capabilities to screen for and manufacture biopharmaceuticals, diagnostics and vaccines targeting key diseases in the region.



- **Biobased traditional medicines:** To promote indigenous knowledge in traditional medicines through the identification of available biological resources in the region with verifiable and validated health benefits, and to understand the active ingredients involved.
- **Bio-based cosmetics and well-being products:** To develop an Eastern African based personal care industry, basing production on local bioresources and targeting expanding regional and international niche markets. Such production would be based on fair trade values while protecting and sustainably using the biodiversity of the region.

Strategic Thematic Area 3: Biobased Industrial Development

The goal of this STA is *to build industries that add value to under-utilised renewable resources in the region*. It has five KRAs:

- **Bio-based and biodegradable packaging materials:** To establish a manufacturing base for bio-packaging materials, together with appropriate regulatory systems and infrastructure.
- **Bioprocessing enzymes:** To maximise the opportunity arising from the region's microbial diversity, through the development of industrially relevant enzymes.
- **Biobased construction materials:** To transform the local construction industry into one that is low carbon and climate smart, and based on locally produced renewable building materials.
- **Bio-based textile fibres:** To achieve a more productive and sustainable textile fibre industry, complemented by the production of a range of textile fibres generated from local agro-waste materials.

Strategic Thematic Area 4: Sustainable Energy

The goal of this STA is *to develop a range of bioenergy products for both household and industrial purposes*. It has three KRAs:

- **Biomass briquettes and pellets as alternative to charcoal and firewood:** To promote initiatives in bioenergy briquette and pellet production from waste materials to substantially reduce the unsustainable use of wood fuel.
- **Production of biogas from organic waste:** To stimulate and support uptake of biogas technologies in the region for household and industrial use.
- **Advanced biofuels:** To support the research and development of biofuels produced from lignocellulosic materials and algae.

Making it Happen

Strategic operational enablers are required to help translate the strategic intentions into programmes, and ultimately into outcomes and impacts. The key enablers for successful delivery of the Eastern Africa Bioeconomy Strategy include:

- **An enabling policy environment** will be crucial for the successful delivery of the bioeconomy strategy in the region. This will be ensured by enacting new but also harmonising existing relevant legislation, policies and standards in the region to support bio-innovation, and bio-businesses. It is crucial for the region to ensure that bioeconomy development helps to achieve the Sustainable Development Goals and does not undermine food security. Governance policies and strategies are therefore needed to ensure that bioeconomy development is used as a vehicle to promote food security, sustainable economic growth, job creation and safeguard the environment. Such an enabling policy environment includes harmonised policies, regulations, product efficacy and safety standards supporting (not stifling) development and deployment of biobased products, such as bio-pesticides, growth promoting biologicals, biobased packaging material, health and wellbeing products, novel foods and bioenergy carriers.
- **Enhancing the bioeconomy innovation system** will be essential, facilitating the connection of R&D actors and entrepreneurs, especially start-up businesses, to affordable financing. Access to capital

and credit facilities under reasonable terms is critical. To successfully bring new bio-products to market, new funding partnerships are necessary, in which innovation, risks and business development costs are borne by several different parties. Professional incubating services are also of key importance, supporting the introduction of new biobased products and technologies to the market. The establishment of new, and strengthening of existing, business incubators is therefore essential. These incubators will seek to provide collaborative work environments for entrepreneurs, helping them transition from startup to independence. Incubator services will include financing facilities and business training courses, as well as in-house services—such as research and development, legal and accounting services which may be too costly for startups. Stimulating Business to Business (B2B) collaboration and supporting private sector actors in Eastern Africa to collaborate with international companies is also important in this context.

- **Capacity development in all areas of the bioeconomy**, building sufficient capacity in all areas of the bioeconomy value chain. The region will need to build human and infrastructural capacities to harness rapidly emerging technologies and adapt them to local needs, through regional centres and service platforms. Generating, promoting, and adopting innovations, technologies, and techniques to convert biomass into goods of higher value and to valorise the primary produce and the agro and biowaste in the region is dependent on scientific and technological skills. These skills are largely inadequate in the region, and capacity building in this field can be enhanced by building shared knowledge platforms. Entrepreneurial skills are critical for good ideas to move through to commercialization. Special support for youth and women entrepreneurs will allow for improvement in gender balance in the region.
- **Coordination, partnerships, communication and effective regional collaboration** are crucial to delivering the objectives of the Bioeconomy Strategy. This requires an understanding of the ever-changing contexts and needs of individual countries. This Strategy proposes a lean, but-fit-for-purpose, coordination and partnership unit embedded in the EAC Secretariat that will provide leadership and coordination to drive implementation.

The development of bioeconomies in the countries in the region is an imperative to enable economic growth and sustainable development. However, it will only be achieved through regional cooperation and strong leadership from governments, with the provision of appropriate policies and incentives. The short term social and economic impact of the COVID-19 pandemic should not deter governments from seeking a new vision for the future, where economies are rebuilt based on long-term sustainability. The EAC has an important role to play in actively supporting the development of sustainable bioeconomies in the region and in addressing all the issues identified above that are needed to make it happen.