



THE EASTERN AFRICAN REGIONAL BIOECONOMY STRATEGY

A summary

OCTOBER 2020

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 underutilised 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 A 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.

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 agroecological 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

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 bioentrepreneurs 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.

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 bioresource 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.

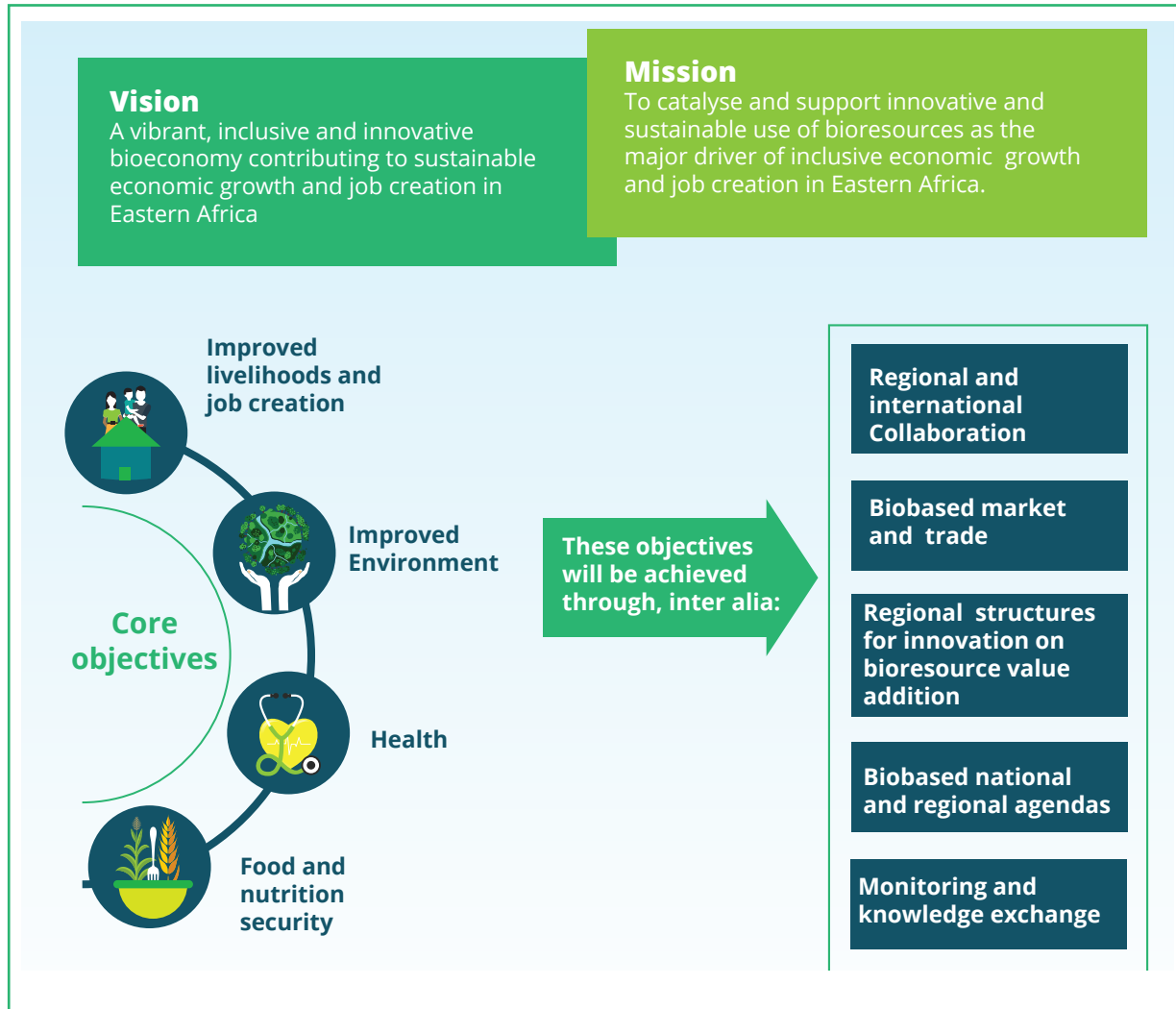
There are, however, generally still weak linkages between researchers and industry. Funding and financial systems to support the innovation chain through all the stages from research and development to the market are also still weak. To date, and as a consequence of the above, there has been insufficient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



CORE OBJECTIVES

The core objectives of the strategy are to support:

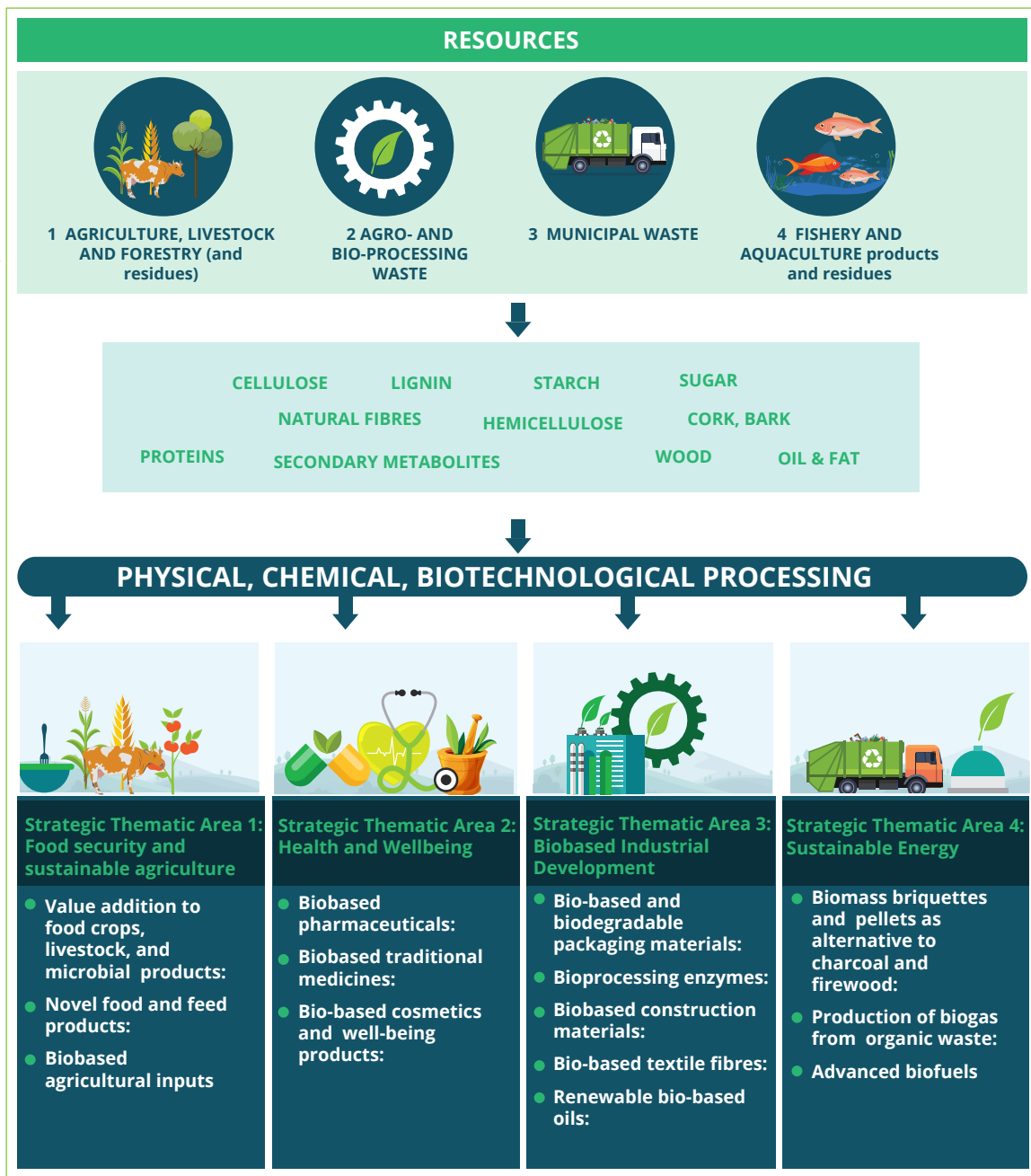
- **Food and nutrition security** through improving farm profitability/productivity and ability to produce nutritious food products.
- **Health**, through development of biobased drugs and vaccines to address key health problems in the region.
- **The Environment**, through reducing GHG emissions, mitigation 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 summarized 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: Delivering 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: Producing 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: Supporting and enhance sustainable agricultural production through the growth of bio-based agricultural inputs (e.g. biopesticides and biofertilizers) produced in the region.



Box 1: The growing market for biopesticides in Eastern Africa

Both globally and across Africa in particular, there is a pressing need to develop cheaper, more environment-friendly alternatives to chemical pesticides. Biopesticides to protect agricultural crops are derived from plants and microorganisms, such as fungi, bacteria, and viruses. They are often much cheaper to develop than new synthetic pesticides. Currently, global sales of biopesticides are estimated to be worth roughly US\$4.3 billion, and constitute some 8% of the overall pesticide market with a growth rate of more than 15% per year.

Due to the pressing need to produce more food more sustainably, preserving vital ecosystem services, global growth of bio-pesticide sales is projected to outpace that of chemical pesticides in the years to come. There is a an increasing number of Eastern African companies and institutions, such as ICIPE, engaged in developing biopesticides for the Eastern African market, worth roughly US\$400 million annually.

There are significant opportunities for increased biopesticide production and use in the region. Such local production can, apart from supporting African farm productivity and sustainability, also benefit job creation and growth of local biopesticide companies.

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: Strengthening bioprospecting and innovation capabilities to screen for and manufacture biopharmaceuticals, diagnostics and vaccines targeting key diseases in the region.



Biobased traditional medicines: Promoting 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: Developing 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.

Box 2. Developing biobased health products in Eastern Africa

While the conventional pharmaceutical market in the region has an annual turnover over of some 4 billion US\$, the market size for pharmaceutical drugs based on traditional and indigenous knowledge is very difficult to estimate. However, traditional medicines using indigenous knowledge based on local biodiversity are often the primary source of affordable health care for well over half of the rural population in Eastern Africa. Natural product extracts are frequently used as the basis for pharmaceutical research across the region's universities.

However, studies rarely progress beyond academia even when the results are promising, partly due to a lack of adequate funding and poor links between academia and industry. A good example of the latter is the BioInnovate Africa Programme where two of its innovation consortia are focused on development

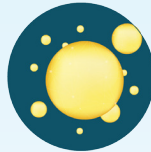
of biobased health products. The first, focusing on malaria prevention, is led by University of Burundi developing low cost, highly efficient and innovative mosquito-repellent products, that can be used for mosquito net impregnation. The repellent is based on essential oils extracted from catnip and other locally produced plant species. The project is also developing appropriate farming methods for catnip production in the context of smallholder farming in Eastern Africa. The other BioInnovate Africa project, led by the Kenya Agricultural and Livestock Research Organization (KALRO), aims at improving the control of tsetse flies transmitting trypanosomiasis in livestock and sleeping sickness in humans. In the project, still at pilot scale, tsetse fly repellents and attractants derived from waterbuck have shown incremental improvements relative to previously formulated blends and have large potential to more efficiently control tsetse fly populations and disease infestations in the region. The waterbuck compound blends are separately formulated and encapsulated on nanoparticles for controlled release and further incorporated in release devices protecting humans and livestock.

STRATEGIC THEMATIC
AREA 3:BIOBASED
INDUSTRIAL
DEVELOPMENT

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



Bio-based and biodegradable packaging materials: Establishing a manufacturing base for biopackaging materials, together with appropriate regulatory systems and infrastructure.



Bioprocessing enzymes: Maximising the opportunity arising from the region's microbial diversity, through the development of industrially relevant enzymes.



Biobased construction materials: Transforming 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: Achieving a more productive and sustainable textile fibre industry, complemented by the production of a range of textile fibres generated from local agro-waste materials.



Renewable bio-based oils: Developing an industry based on sustainable production of renewable oils derived from the bioresources of the region.

Box 3. Bio-packaging and alternative non-plastic products.

Globally, the biodegradable packaging market is expected to grow from US\$90.13 billion in 2019 to US\$126.34 billion by 2025. The market value of plastic articles traded as packaging materials in Eastern Africa between 2015 and 2019 was estimated at around US\$700M (or around 480,000 tons), and the region has over 300 companies selling packaging material of which less than 80 are manufacturers.

Many countries in the region have banned the use, manufacturing and import of plastic bags. These policies, mitigating climate change and limiting plastic waste have also provided opportunities and incentives for the use of biobased renewable material to be used for the production of bags. This includes fabric-based bags, non-woven bags, pulp paper-based bags, woven bags (using sisal and cotton fibres) and recycled textile

material. It also includes the novel production of bags made from cassava starch. These cassava bags are biodegradable within 6 months and approved by Kenya's National Environment Management Authority (NEMA). So far, cassava starch bags are imported from countries such as Indonesia. However, cassava is a major crop in the region and is a staple food in several countries, with an annual production of over 12 million tonnes. The bags could be produced locally from waste cassava peeling residues, which amount to over 3 million tonnes per year. Such alternative and complementary use of cassava produce would support profitability of cassava farming in the region, and also create new jobs in an expanding Eastern African bio-packaging sector.

Additional plastic bans in Kenya include cutlery, straws, PET-bottles, sweet wrappers and other products containing petroleum based polymers of which most can be substituted by biobased renewable materials including bamboo, wood and crop residues. The global biodegradable cutlery market size was valued at US\$40 million in 2018 and is expected to grow rapidly in the coming years, including in Eastern Africa.

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: Promoting 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: Stimulating and support uptake of biogas technologies in the region for household and industrial use.



Advanced biofuels: Supporting the research and development of biofuels produced from lignocellulosic materials and algae.

Box 4. Increased use of briquettes and pellets; sustainable and modern energy carriers.

The Eastern Africa region has large potential to produce modern bioenergy from a variety of biomass feedstock resources, including forest and agricultural residues, energy crops and the organic component of municipal solid waste. Briquettes and pellets produced from, agroprocessing, agricultural and forest residues such as sugar cane and pineapple bagasse, coffee, maize and sawdust among others provide a more sustainable alternative to unsustainable firewood and charcoal production causing deforestation. Apart from being more efficient energy carriers, the use of briquettes and pellets also results in improved indoor air

quality and human health. The technology used depends on the production scale, ranging from informal operations to large industrial operations.

There is an average production of sawn wood in the region of around 970,000 cubic metres with an estimated 120,000 cubic metres of residues with potential use for briquettes and pellets or in combination with other agricultural or forest residues. Other material that is readily available is sugar cane bagasse. The average production of bagasse is around 5.5 million tonnes per year. The production of briquettes and pellets is still low in the region but could be expanded for use for the industrial market including the tea, coffee vegetable oil, and food processing sectors and other sectors that use boilers in their processes. The technology used depends on the production scale, ranging from informal operations to large industrial operations.

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 biopesticides, 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.

Box 5: Coastal and freshwater resources for the bioeconomy.

The shores of Eastern Africa have many resources such as shells, crabs, seagrasses, seaweeds (algae), starfish, small fish, shrimps etc. with the resources in bays, mangrove stands and forests. Large fishery resources are located in the lakes of Eastern Africa (e.g. Lake Victoria, Turkana, Tanganyika and Kyoga).

The fish market in Eastern Africa is estimated at 1,300 million tonnes/year and average waste or by-products generated from the sector is around 600,000 cubic meters per year. Around Lake Victoria the fish processing industries generate approximately

150,000 tonnes of waste with nearly 80% dumped and not utilised. The residues of fish filleting can however be used to make low-cost products with a high concentration of essential nutrients. For instance, in Uganda by-products from Nile perch (*Lates niloticus*) are used in development of different micro-nutrient fish powders that could be used to enrich diets. Fish skin, which today is considered as waste, can be processed into leather. In Kisumu about 70 tonnes of fish skin waste are reported to be generated weekly to make leather products for export. This has the potential to boost leather production in the region, since African countries account for only 4% of world leather production and 3.3% of value addition in leather. Leather exports from Kenya in 2013 amounted to only US\$140 million, which accounts for 0.14 % of the world's exports.

About the BiSEA project

The project “Developing an Innovation- Led Bioeconomy Strategy for Eastern Africa” (BiSEA) started in 2018 and will end in 2021. The project is led by the East African Science and Technology Commission (EASTECO) and supported by the BioInnovate Africa Programme (www.bioinnovate-africa.org). The main objective of BiSEA is to support the development of regional innovation driven bioeconomy strategy and a policy agenda shared by the countries in the Eastern Africa region. This has been done in close consultation with Science and Technology Councils and Commission and relevant ministries and stakeholders in all six BioInnovate countries (Ethiopia, Burundi, Kenya, Rwanda, Tanzania and Uganda) including South Sudan. The BiSEA project partners are;

1. East African Science and Technology Commission (EASTECO), Kigali, Rwanda
2. African Technology Policy Studies Network (ATPS), Kenya
3. Scinnovent Center, Kenya.
4. Bio-Innovations Ltd, Uganda
5. Stockholm Environment Institute, (SEI) – Africa Center, Kenya

About the Regional Drafting Group

A key component of the BiSEA project is the Regional Drafting Group (RDG), charged with the task to develop the regional bioeconomy strategy. Members of the RDG (see below) have been selected on country basis to represent their countries in the drafting process. Member of the RDG include the following:

1. Dr. Beatrice Lyimo, Tanzania Commission for Science and Technology (COSTECH, Tanzania)
2. Dr. Teklehaimanot Haileselassie, Institute of Biotechnology, Addis Ababa University, Ethiopia and Dr. Kassahun Tesfaye, Director General, Ethiopian Biotechnology Institute, Ministry of Science and Technology, Ethiopia
3. Dr. Maxwell Otim Onapa, Director Science, Research and Innovation, Ministry of Science, Technology and Innovation, Uganda.
4. Prof. Steve De Cliff, Permanent Executive Secretary of the National Commission for Science, Technology and Innovation, Burundi
5. Prof. Arop Leek Deng, Director General, Directorate of ST&I, Ministry of Higher Education, Science and Technology, JUBA, South Sudan and Dr. Clara S. G Lumori, South Sudan
6. Dr. Esperance Munganyika; Rwanda Agriculture Board, Rwanda
7. Dr. Benson Mburu, National Commission for Science, Technology and Innovation (NACOSTI), Kenya

The National and Regional Consultation Process

The Regional Bioeconomy Strategy has been developed through an open, transparent, and broadly consultative process with a view to include a variety of perspectives and to reflect different contextual realities in the countries in the region. The national consultation process has part of the BiSEA project and for drafting of a regional strategy owned by countries the region. The directions, advice, input and guidance to the drafting process comes from a broad set of stakeholders at the national level and through a number of regional consultation which has included;

- Government and policy bodies,
- Industrial and commercial actors,
- Practitioners, farmers etc
- Academia

For more information about the BiSEA project,

Please contact: Fortunate Muyambi, EASTECO, fmuyambi@eachq.org

www.easteco.org