



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



Strengthening the global bioeconomy

CONTEXT

The bioeconomy applies innovative technologies to convert renewable biomass-resources from land and sea (crops, timber, fish, animals and micro-organisms) into food, health-products, cosmetics, textiles, industrial raw-materials and energy. Fostering the bioeconomy brings unprecedented opportunities to transform economies of developing and least developed countries through bio-based value chains and industries, while avoiding negative environmental impacts of conventional industrialization pathways. Developing the bioeconomy sectors will advance global food security, improve nutrition and public health, make industrial processing cleaner and contribute significantly to mitigate climate change. Nurturing the bioeconomy is relevant for UNIDO's mandate on inclusive and sustainable industrial capacity building.

APPROACH

Areas in which UNIDO already plays a role to strengthen the bioeconomy are production of bio-fertilizers and bio-pesticides, quality management of pharmaceuticals and natural medicines, production of cosmetics, and the general manufacturing of packaging and actual consumer goods from organic material (various natural fibers for textile and garment, leather products, etc.). Also in the resource intensive construction sector, opportunities exist for substitution of energy and emission intensive products like steel and concrete through organic materials.

Biotechnology provides a range of enabling technologies, which can be applied in all major industrial sectors. It can substantially improve the efficiency of manufacturing processes and value addition, providing additional opportunities for progress towards the SDGs.

In agriculture, biotechnology offers new scientific approaches to improve plant- and animal health and use microorganisms to improve productivity, nutrient cycles, resilience against pests, climate change impacts and sustainability of production.

Food processing and preservation traditionally uses fermentation and similar biotechnologies to reduce food-waste.

Green chemistry is an area where "Enzymes" (bio-catalysts) are applied to reduce the need for energy intensive high-temperature, and high-pressure processes. Residues and waste materials are organically degradable and do not bio-accumulate, which reduces environmental impact and pollution. Mushroom farming and insect cultivation are options to valorize processing waste and recovery of by-products.

Bio-refining and novel processing provide pathways to reduce the dependence on fossil fuels for mobility and chemical production.

The bioeconomy provides new opportunities to better integrate industrial ecosystems. It aims to avoid the production of waste-streams altogether and instead emulates natural cycles of growth (assimilation) and re-mineralization, along the logic of life cycle thinking of sustainable production and consumption.



GEOGRAPHICAL SCOPE

GLOBAL

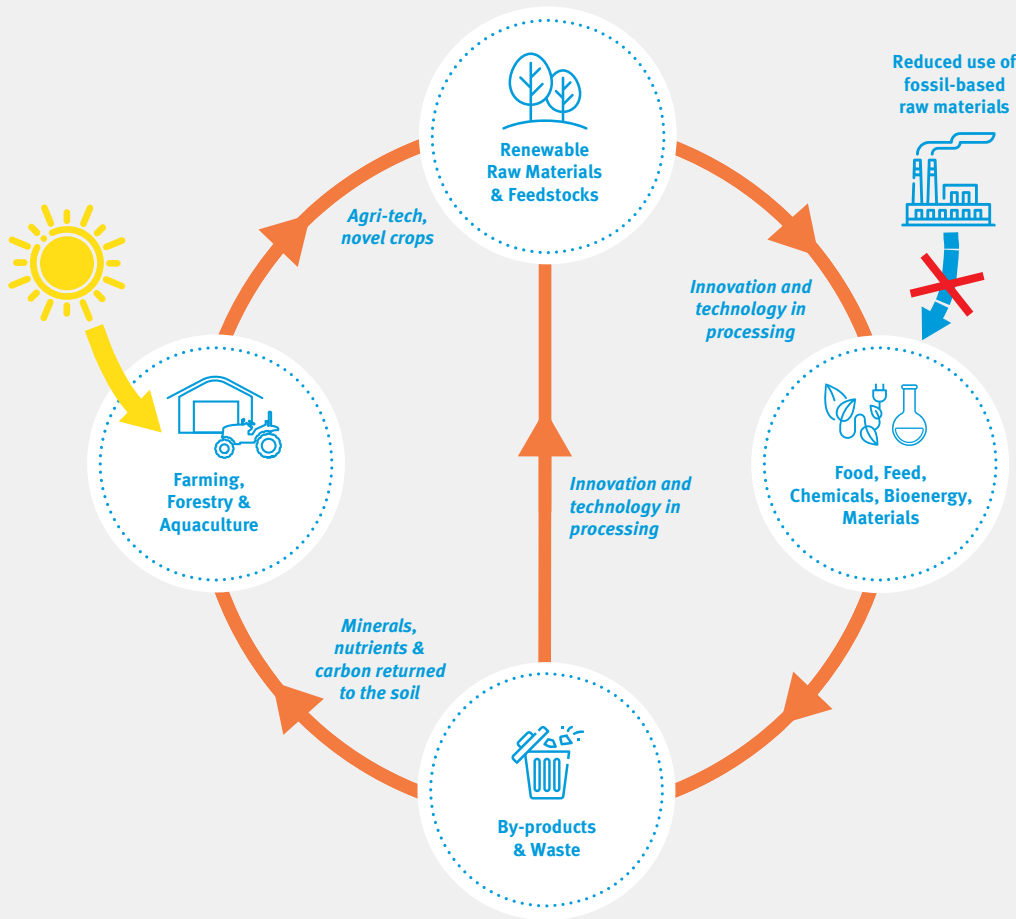


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WORKING TOWARDS





UNIDO aims to further strengthen its activities and contributions to the sustainable growth of the bioeconomy. Some examples of the organization’s efforts on the matter are:

- The promotion of bamboo and rattan SMEs and Industries for pro-poor livelihood development and environmental management through south-south knowledge transfer in Cambodia and Ethiopia. Bamboo is a highly regenerative resource with a potential to substitute energy and emission intensive nonrenewable, finite resources;

- The increase of the resilience of communities in the West Indian Ocean to the effects of climate change through alternative value chains, such as the processing of seaweed and coconut into food and non-food resources for strengthening the bioeconomy;
- Twin biochar-energy utilities as a benefit for the climate, communities, and the economy. The initiative will use biochar as soil amendment to improve nutrient cycles and reduce climate vulnerability (draught effects) in the cultivation of plantation crops such as tea and coffee in Kenya.

“4IR technologies, applied to bioeconomy, are great tools to reduce risks associated to the vulnerability of rural communities, and also provide opportunities for development”

Riccardo Savigliano,
Chief of Agro-Industries and Skills Development Division at UNIDO

FOCUS AREAS



Climate change mitigation and adaptation



Resilience of rural communities



Bio-based industries



Water and other natural resources management



Conservation of biodiversity



Remedial of land degradation



Cleaner industrial processing