



Bioeconomy and Mainstreaming Biodiversity for Food and Agriculture

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SPREP Headquarters, Apia, Samoa

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- Bioeconomy to halt biodiversity loss
- Bioeconomy initiatives in the Pacific
- FAO's role in supporting bioeconomy



Bioeconomy to halt biodiversity loss

- Biodiversity and Agriculture are closely interlinked.
- Agrifood systems – crop and livestock production, fisheries, aquaculture and forestry – manage significant parts of the biomass:
 - 44 % of the world's habitable land is agricultural land (48 million km²)*
 - 31% of the world's land area is forests – in half of it there is human activity
 - Oceans under fishing activities? 2%-55%

Source: <https://ourworldindata.org/land-use>

We should think of making our actions more responsible and sustainable !



Biodiversity is being lost at an unprecedented rate and progress in reverting this trend has so far been modest (SDGs Report, 2023).



Bioeconomy to halt biodiversity loss

- The bioeconomy is based on the **sustainable and circular use of biological resources and processes** to produce food, feed, bio-based products and services – has major potential to address several interlinked global challenges, including:
 - hunger and poverty
 - **biodiversity loss**
 - climate change
- Circular Economy strategies also seek to keep materials in the eco-sphere and the techno-sphere for as long as possible, rather than “discarding” them. This should help reduce resource use and energy demand, within a product’s life cycle (Ritz’en and Sandstrom, 2017).

The bioeconomy tackles the **five key direct drivers of biodiversity loss identified by IPBES***:

- **Land use changes**: It reduces the amount of land needed to provide resources to the economy
- **Exploitation of biodiversity**: It manages renewable resources such as fish stocks, soil biodiversity for the long term
- **Climate change**: It reduces greenhouse gas emissions across the economy
- **Pollution**: It reduces the use of synthetic chemicals
- **invasive alien species** It designs out the waste on which invasive alien species can be transported to new ecosystems

*2019, IPBES. *The Global Assessment Report on Biodiversity and Ecosystem Services*. https://files.ipbes.net/ipbes-web-prod-public-files/inline/files/ipbes_global_assessment_report_summary_for_policymakers.pdf

Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services(IPBES)



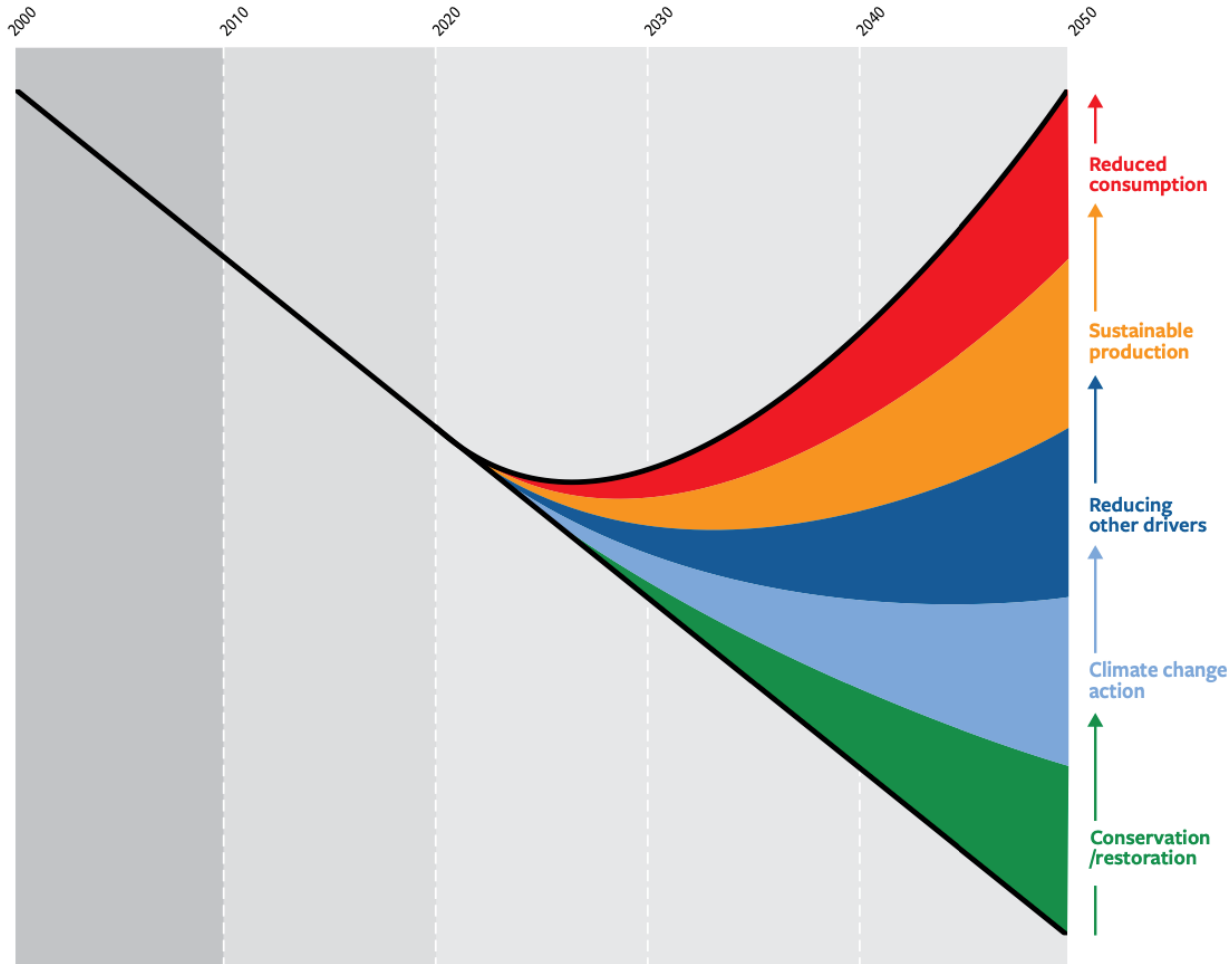
Bioeconomy to halt biodiversity loss



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A portfolio of actions to reduce loss and restore biodiversity



Agrifood systems account for the largest share of the global bioeconomy and thus have enormous potential to bring about transformative solutions to reverse the biodiversity loss trend

CBD, 2020. *Global Biodiversity Outlook*. <https://www.cbd.int/gbo/gbo5/publication/gbo-5-en.pdf>



Opportunities for Circular Bioeconomy to halt biodiversity loss

Food Waste – an opportunity

931 million tonnes of food waste generated in 2019

- 17 % of total global food production wasted
- 11% in households, 5% in food service
- 2% in retail

Food waste can be converted to compost or used to produce biogas, thereby avoiding harmful methane emissions



Biofertilizers and Biopesticides

Organic wastes (crop residues, food waste, seaweeds and animal waste) can be converted into biofertilizer products rich in nitrogen, phosphorous, potassium and other nutrients and into biopesticides.

Bioenergy

Bioenergy production as a tool for waste management (agricultural and forestry wastes and by-products) but also manure or microbial biomass, seaweeds.

Sustainable modern bioenergy systems are closely linked with food security and energy security.



Opportunities for Circular Bioeconomy to halt biodiversity loss



Recycling of nutrients

Soil organisms act as the primary driving agents of nutrient cycling, regulating the dynamics of soil organic matter, soil carbon sequestration and greenhouse gas emission, modifying soil physical structure and water regimes, enhancing the amount and efficiency of nutrient acquisition by the vegetation and enhancing plant health.

Reuse of water

Urban and agricultural water can be treated and re-used as a resource.

Need an integrated water management approach considering the system's and surrounding's perspectives and procedures for agri-food transformation.





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Relevant initiatives in the Pacific

Pacific Action Plan for Mainstreaming Biodiversity for Food and Agriculture (2024-2030)



Identifies priorities for the sustainable management of biodiversity for food and agriculture and bioeconomy:

- Expansion of sustainable organic and regenerative agriculture
- Green and blue certifications
- Food waste reutilization:
 - Urban and rural composting schemes to convert biomass from organic waste into biofertilizers
 - Reducing/reutilization of food waste in restaurants and retailers.
- Research on innovative biomass businesses
- Sustainable ecotourism

Endorsed at the 37th FAO Regional Conference for Asia and Pacific (APRC37) on February 2024



Relevant initiatives in the Pacific

Pacific Regional Pesticide Registration Scheme



Proposal for
a Regional Pesticide Registration Scheme
for the Pacific Islands

Highlights

As the implementation of regional standards for pesticide registration, safety, and management and control of pesticides in the Pacific Islands, this initiative is essential to enhance food safety and security, improve pesticide regulation systems and control measures, increase the number of pesticides under registration, and to support farmers to practice sustainable

pesticide use. This initiative will support the Pacific Islands, which have long been engaged in the process of pesticide registration and management through regional technical expert meetings, the goal of which is to establish a regional pesticide registration system. Overall, regional registration for pesticide regulation will improve the ability of the regional authorities to control their chemical management and control of pesticides.

Addressing pollution

89 highly hazardous pesticides registered or available in the Pacific, including chemicals listed in Annex III of the Rotterdam Convention in 2014.

Promoting ecologically based alternatives such as biopesticides to highly hazardous pesticides to enhance food safety and security in the Pacific region.



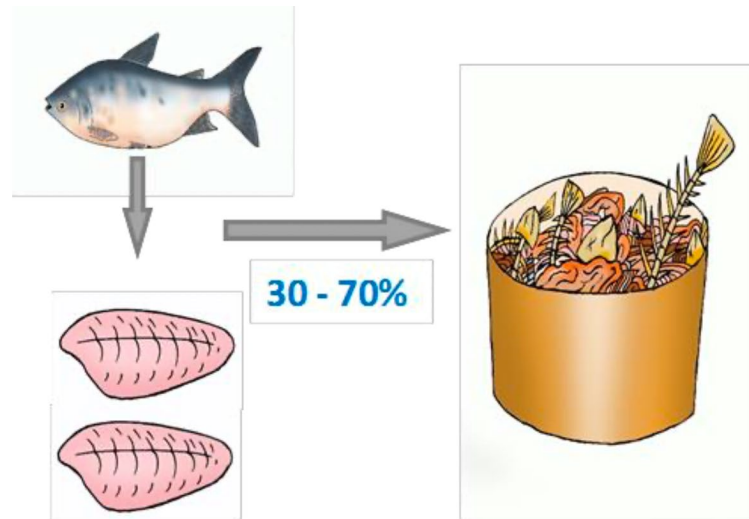
Relevant initiatives in the Pacific



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Fish silage – an opportunity for the Pacific



Fish silage as an alternative to fish meal for animal feed

FAO has had reasonable success in Barbados.

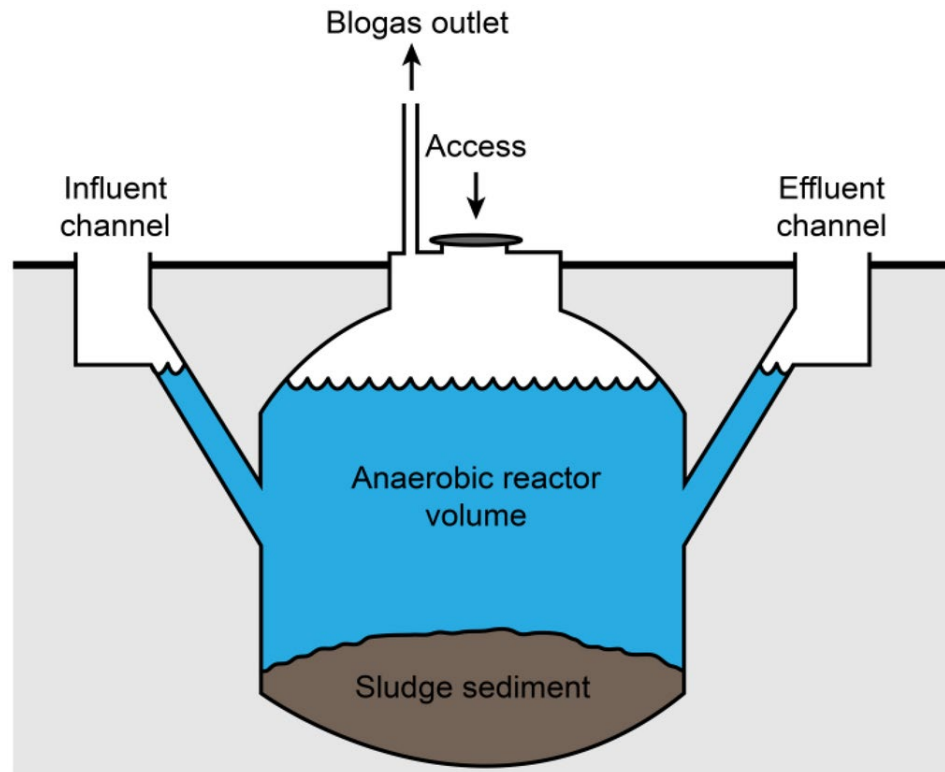
Some relevant work in pacific (?). Potential for scalability.

- Excellent fertilizer
- Good small business for women
- Two major strategies for development:
 - larger-scale, high-capital-cost offshore operations
 - small-scale, coastal farms, integrated into coastal habitats or in shallow waters



Relevant initiatives in the Pacific

Biogas from pig waste



Source: <https://www.mdpi.com/1996-1073/6/10/5314>

FAO organized the Bioenergy Week in Bangkok in 2023.

- Tonga (GCP/TON/001/GFF): Integrated Land and Agroecosystem Management Systems
 - Biodigesters to convert pig waste to biogas for cooking and other uses
- Careful though on sustainability and scalability should be given for small atoll nations.
- Individual to community-based model could be option ?



Relevant initiatives in the Pacific

Food waste reduction

- Farm to Fork (F2F) initiative in Fiji – “Connecting Farmers to Chefs” collaborative effort to foster stronger relationships between the tourism and agriculture and fisheries sectors, aiming to promoting local produce.
 - Reducing post harvest loss
 - Promoting agri-tourism
 - Enhancing producer group’s income





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FAO's role in supporting bioeconomy

FAO leads the International Sustainable Bioeconomy Working Group (ISBWG).

The Global Forum for Food and Agriculture in 2015 recommended that FAO should take the lead on global policy discussions on sustainable and circular bioeconomy in food and agriculture.



Multi-stakeholder expert group: 35 members: private sector, civil society and international organizations.



Expertise and background from policy to research from all five continents.



Support to increase national capacities to develop strategies and policies for sustainability and circularity in the bioeconomy.



Facilitates international dialogue and serves as a platform for sharing knowledge and experiences on circular bioeconomy innovations, technologies, practices and policies.



Advisory body to FAO

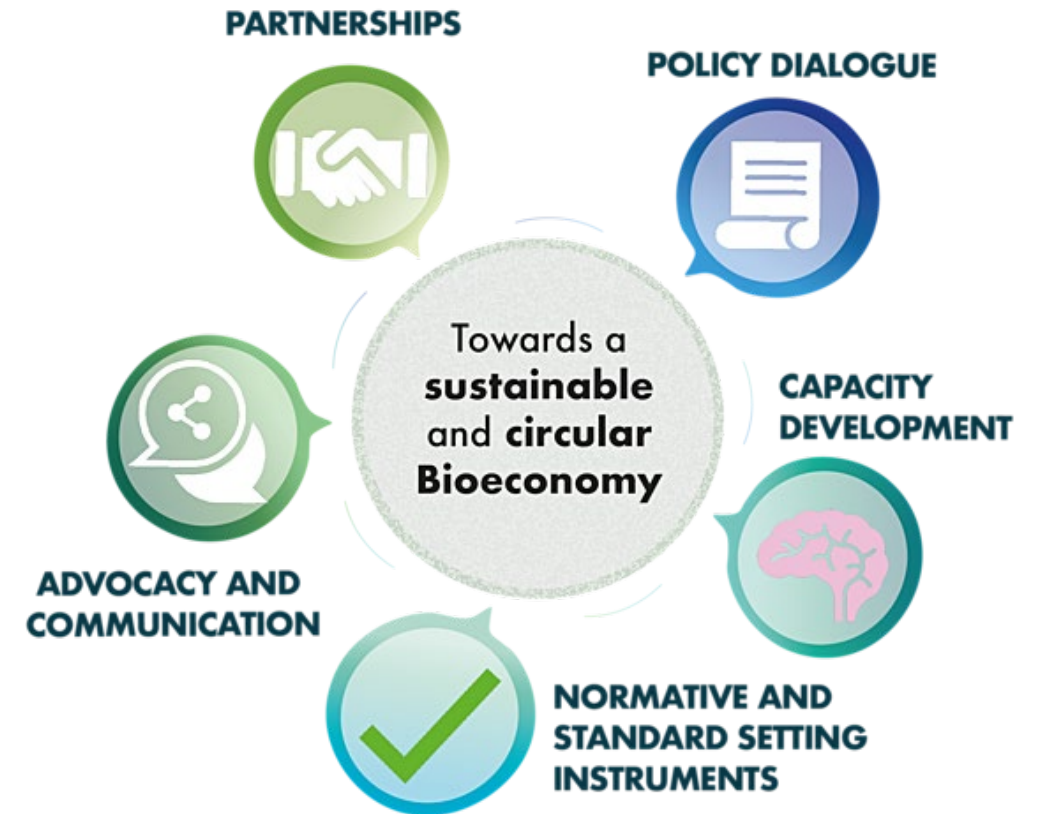


FAO's role in supporting bioeconomy

Bioeconomy for Sustainable Food and Agriculture Programme

Moving towards a more strategic approach to bioeconomy:

- Improve the sustainability of agrifood systems with bioeconomy solutions at three levels: technological, organizational and social
- Policy support to improve policy coherence to achieve national sustainability objectives;
- Pilot countries to support the identification of sustainable and circular opportunities



FAO's role in supporting bioeconomy



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Dashboard on bioeconomy strategies and related actions for sustainable development



Dashboard on bioeconomy strategies and related actions for sustainable development

The dashboard is a global public resource to advance a sustainable bioeconomy by providing comprehensive information for decision-makers. It primarily analyzes two datasets, focusing on global bioeconomy strategies and their alignment with biodiversity and climate targets.

This dashboard can be referred for to guide the upcoming discussions in various sessions.


- Home
- Global overview
- National strategies
- Multi-country strategies
- BD, CC & FST plans

About the dashboard

This dashboard is a global public resource to advance a sustainable bioeconomy by providing comprehensive information for decision-makers. It primarily analyzes two datasets, focusing on global bioeconomy strategies and their alignment with biodiversity and climate targets. The first dataset serves as an interactive repository, mapping actions within national and multi-country bioeconomy strategies to global targets and economic sectors. The second dataset explores how countries integrate the bioeconomy into key national plans related to biodiversity, climate, and food systems transformation. It assesses documents such as National Biodiversity Strategies and Action Plans (NBSAPs) and National Communications to the Convention on Biological Diversity (CBD); Nationally Determined Contributions (NDCs), National Adaptation Plans (NAPs), Long-Term Low Emissions Development Strategies (LT-LEDS) and National Communications (NCs) to the United Nations Convention on Climate Change (UNFCCC); and National Food Systems Transformation Pathways submitted to the Food Systems Summit (FSS) to provide insights into the nature and relevance of national bioeconomies.

Methodology

This repository of bioeconomy strategies draws on data from diverse sources, including FAO country and regional offices, external partners and counterparts, international experts, conferences, publications, websites and news. While every effort has been made to ensure the completeness and accuracy of this dataset, please contact bioeconomy@fao.org if you notice any inaccuracies.

Full methodological note 

Global overview

Explore the global landscape of bioeconomy strategies, interact with summary statistics and see which countries integrate bioeconomy into their climate, biodiversity, and food systems plans.

National bioeconomy strategies: country profile

Visualize key information contained within national bioeconomy strategies, including prioritized sectors and subsectors. Understand how the actions within each national bioeconomy strategy are mapped to climate and biodiversity efforts.

Multi-country bioeconomy strategies: summary profile



Conclusions

- More investment in innovative biotechnology required which are local-specific and culturally appropriate
- Need for more science-based knowledge to increase confidence in policy makers and investors
- Bioeconomy focuses on minimizing waste and maximizing resource efficiency. By adopting circular practices, these regions can reduce waste, promote sustainability, and enhance economic resilience.
- Establishing recycling centers, waste-to-energy facilities, and repair workshops can support circular practices.
- Focus on renewal energy sources like solar and hydropower to make Agrifood systems value chain more efficient.



Conclusions

- Encouraging circular business models through policy upgradation
- The focus of such business model should shift from end-of-life solutions to upstream innovation. Preventative measures should be prioritized over reactive clean-up operations
- The analysis of Nationally Determined Contributions (NDCs) shows that less than 30% of NDCs mention circular economy, with most focusing on waste management. Advocacy for bioeconomy / circular economy integration in climate action planning is essential. Need for systematic integration in national plans and strategies, e.g. NBSAPs, NDCs

In summary, the Pacific Islands have a unique opportunity to embrace circular economy/bioeconomy practices, fostering environmental stewardship, economic growth, and community well-being.





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Thank you

THANK YOU | MEITAKI | VINAKA | KAMMAGAR
KO RABA | ITÛBA | FAKAAUE | KE KMAL MESAUL |
KOMMOL TATA | FA'AFETAI | TANGGIO | MALO |
FAKAFETAI | TANGKYU



FAO Sub-regional Office for the Pacific Islands