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T20 Policy Brief

Task Force 02

SUSTAINABLE CLIMATE ACTION AND INCLUSIVE JUST ENERGY TRANSITIONS

The Social Dimensions of Alternative Bioeconomy Pathways and Sustainable Use of Biodiversity: Lessons for the G20 Based on the Cases of Brazil and Thailand

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Abstract

This policy brief focuses on smaller-scale and more diversified bioeconomy pathways grounded in local community development and sustainable use of biodiversity for bio-based goods and services. Such pathways are compatible with the notion of the sociobioeconomy and can be contrasted with bioeconomy pathways that rely on large-scale production of low value-added agricultural or forestry products. Using the examples of the heterogeneous experiences of Thailand and Brazil, we develop principles and recommendations to support the development of the sociobioeconomy worldwide. The outcomes of applying the principles and implementing the recommendations are correlated with some key aims within the three Rio Conventions, thereby illustrating how the sociobioeconomy approach can help address the polycrisis of biodiversity loss, land Degradation, And Climate Change.

Diagnosis of the Issues

Two main bioeconomy pathways can be distinguished. The first is large-scale, centralized, requires significant levels of investment and infrastructure, and involves products or processes linked to international markets. Although this pathway can support economic growth, it does not prioritize socio-ecological dimensions. The second pathway is small-scale, decentralized, and heterogeneous, and depends upon local and/or Indigenous knowledge and labor, compatible with the notion of *sociobioeconomy* (Costa et al. 2021). The first pathway tends to rely more on bio-technology and/or bio-resource visions of bioeconomy; by contrast, the second relies more on a bio-ecology vision (Bugge et al. 2016). While both pathways have a role to play (Johnson et al. 2022), the second uniquely links social well-being to maintenance of biodiversity and healthy ecosystems. In this brief, we focus on social dimensions of this second or alternative bioeconomy pathway, with special reference to biodiversity in low- and medium-income countries. We identify principles and propose recommendations for the G20 to support the development of the sociobioeconomy and sustainable use of biodiversity.

Overview on biodiversity and bio-resources for selected countries

Sustainable use of biodiversity is critical for a modern and sustainable bioeconomy although socio-economic development levels, climatic zones, and bio-resource endowments vary considerably around the world. Brazil is the world's most biodiverse country, due to the vast Amazon rainforest. Yet, smaller countries with different bio-resource endowments are also highly biodiverse. Among the world's most biodiverse countries, six are in key regions of Latin America, Southeast Asia, and sub-Saharan

Africa (see Table 1). All countries seek a common bioeconomy vision in supporting biodiversity, sustainable use of land and biomass, and climate resilience. Here we use the cases of Brazil and Thailand to illustrate that, despite the diverse underlying conditions they face, many countries have a common aim: to promote the bioeconomy while ensuring socio-ecological safeguards.

TABLE 1: Statistics for selected G20 and non-G20 countries

Statistics/ Countries	G20	Biodivers e Index Ranking	Country Area (million ha)	Forest Land (%)	Crop Land (%)	Permanent Meadows and Pastures (%)	Other Land (%)
Brazil	Yes	1	852	58%	8%	20%	12%
Indonesia	Yes	2	192	48%	28%	6%	17%
Colombia	No	3	114	52%	4%	34%	8%
South Africa	Yes	19	122	14%	10%	69%	7%
Thailand	No	20	51	39%	44%	2%	15%
Kenya	No	23	58	6%	11%	37%	44%

Note: Other land refers to barren and desert areas, urban land, and infrastructure.

Sources: (FAOSTAT 2021).

The case of Brazil

Brazil is a global leader on tropical agricultural sciences and one of the largest food and biofuels producers. It is also biologically and culturally megadiverse, spanning six biomes with over 500 million hectares of remaining native vegetation. The Indigenous population of 1.8 million people includes 300 different ethnicities. In addition, more than one million *quilombolas* (descendants of African slaves who resisted or fled slavery and founded communities in remote areas) and millions of other forest-dwelling and deprived

communities living in large cities near forests, contribute to the cultural mosaic of diverse knowledge in the uses of natural resources in Brazil.

Brazil's unparalleled comparative advantages make it a natural leader in the development of a sustainable bioeconomy that address both biological and socio-cultural diversity. This concept of bioeconomy is characterized by a diversified agricultural base that ensures local food security and supports the national and global economy (Coudel et al. 2023). Data from the national agricultural census indicate that the value of sales of fruits, waxes, oils, and seeds of native species in Brazil reached USD 1.1 billion in 2017, with small farmers and “extractivism” (small-scale extraction of natural resources) responsible for 66% of total sales (Nobre et al. 2023).

In cities, products are transformed into a vast collection of food, fibers, dyes, pharmaceuticals, and cosmetics in local markets. In the Amazon region, just 13 bio-based products were estimated as providing USD 1.9 billion in value-added (Nobre et al. 2023). These bio-based products are just a fraction of the bioeconomy in the Amazon region, which is crucial for meeting local dietary needs and preferences at affordable prices and promoting circular flow of local income while maintaining standing forests.


Protected and managed ecosystems offer rainwater irrigation services valued at USD 1 billion to USD 3 billion per year, equivalent to 20% to 60% of national agricultural subsidies (Nobre et al. 2023). Currently, no other irrigation system is in place for 96% of planted areas and 99% of pastures, both of which are critical for the livelihoods of myriad, marginalized populations in Brazil. This is one reason why the sociobioeconomy plays a crucial role in ensuring a just transition to a low-carbon and resilient economy.

The case of Thailand

Thailand uses both bioeconomy pathways in its approach. In an effort to address the rural communities' marginalization and lack of empowerment and build on their strong relation to local bio-resources, Thailand has promoted the artisanal or community-based model through the work of the Biodiversity-based Economy Development Office (BEDO 2023). At the same time, Thailand promotes a large-scale approach, especially through the Bio-circular Green Economy (BCG) model, which includes investments in technology, infrastructure and human capacity (NSTDA 2021). Both pathways in Thailand include social-innovation platforms operating across diverse conditions and sectors. Three examples are:

The Oxfam Gender Transformative and Responsible Agribusiness Investments in South-East Asia (GRAISEA) program fosters women's and small-scale agricultural enterprises, aiming to enhance growth and market share. In Thailand, it promotes sustainable fishing practices and supports a women-led social enterprise called Fisherfolk, buying fish directly from local communities at fair prices (Tobing-David 2019)

Thailand Network of People Who Use and Conserve Vetiver connects to the Vetiver Network International (TNVI) to exchange knowledge worldwide on the use of vetiver grass for farmers to help farmers address land and water degradation that stemmed from growing monocrops with concentrated chemicals (Unruan Leknoi and Likitlersuang 2020). King Rama IX, starting in the 1990s, promoted an initiative for local farmers to cope with such challenges by using vetiver grass – which has three-meter-long roots that protect against erosion, retain moisture and nutrients without chemical fertilizers, and provide bioengineering solution to reduce landslide risk.



The Forest Landscape Restoration 349 Fund platform by WWF Thailand encourages local farmers in northern Thailand to shift from maize monoculture cultivation into integrated farming, reducing negative impacts on biodiversity and air quality (PM2.5). Furthermore, this social innovation platform aims to trade carbon credits on the Stock Exchange of Thailand (SET) (U Leknoi and Surapolchai 2023).

Thailand's bio-circular green economy model combines community, national and international knowledge bases. In economic terms, it encompasses the re-purposing of “residuals,” which refer to freed-up physical resources, labor and technology that can unlock new streams of economic development (Tagliani 2024a). Thailand is reforming its bioeconomy to ensure greater social inclusivity and to update its regulations and incentives in line with higher value-added production (Tagliani 2024b)

Recommendations for the G20

Context: Social Dimensions of Bioeconomy

In the G20, both the circular economy and bioeconomy have been emphasized (Mandavi et al. 2022). The recommended approaches have included biodiversity schemes that go beyond setting aside natural habitats for including community education about built assets and the conserved environment (Gagan and Aeshna 2023). Regarding the bioeconomy of food and agricultural systems, capacity development and financing are recognized as critical for advancing circular practices to minimize food loss and waste and add value. Food-system management and consumption patterns need to shift towards more circular, resilient, and sustainable pathways, with viable financial models based on public-private partnerships (Simon et al. 2022). There are additional impacts through improved energy availability, attracting other economic activities beyond biobased value chain activities.

Of particular interest for the G20 is the establishment of standards for measurement and evaluation on the social dimensions of bioeconomy. There are currently no internationally agreed indicators, and the most commonly used indicator for social issues is well-being (Gardossi et al. 2023). Social indicators such as workers' rights and land rights are hard to measure. The UN Food and Agriculture Organization (FAO) developed criteria to assess bioeconomy performance that include the social dimension (Bracco et al. 2019). Yet there is a need for basic socio-cultural principles that emphasize alternative bioeconomy pathways. These principles can include learnings from Brazil's experience with Indigenous groups and from Thailand's BCG model in terms of utilization of socio-economic residuals.

Principles and Recommendations

We make four recommendations to the G20, with particular focus on low-and middle-income countries:

1. Empower Indigenous Peoples and local communities.

Stakeholder processes in developing bioeconomy guidelines and policies need to go far beyond traditional principles of local consultation to fully incorporate traditional knowledge and local aspirations when implementing bioeconomy strategies at sub-national and national levels. Establishing a G20 platform for collective rights to bio-resource development and legal safeguards for sustainable use of biodiversity can help ensure territorial and cultural integrity for Indigenous Peoples and local communities (IPLC) alongside access and benefits-sharing.

2. Focus on diversifying and differentiating rather than scaling up.

Unlike energy or industrial actions, scaling up is less relevant for alternative bioeconomy pathways, which do not focus on production growth and industrialization. Instead of scaling up value chains of large-scale and low-value-added agricultural or forest commodities, the aim instead is to diversify into new applications and value-adding products and activities, which also differentiate geographically according to local socio-ecology and community enterprise. The G20 framework for bioeconomy can thus encourage and support locally embedded value chains, thereby emphasizing sociobioeconomy and environmental resilience.

3. Promote innovation with local-empirical & techno-scientific knowledge exchange.

The bioeconomy innovation systems supported by the G20 must promote knowledge exchange between the local-empirical and the techno-scientific worlds, creating a push from the bottom up. These exchanges highlight the importance of combining experiences on the management of complex ecosystems, including through multifunctional, labor-intensive agriculture and land uses, which offer greater climate resilience. Public research institutions are essential and need to reach out to rural areas to take advantage of circular practices, local and native knowledge, and sustainable use of biodiversity, leading to high value-added innovative services and products.

4. Data, digital access, and standardization to better leverage natural capital.

Lack of data and digital access, especially in rural areas, has severe implications for bioeconomy and development pathways of affected populations. The lack of data and insufficient or inconsistent incorporation of informal bio-resource development activities inhibits investment and prevents benefits from flowing to local communities for their own bio-based resources and ecological services. Domestic and local bioeconomy activities need to be recognized just as internationally traded commodities are, with lifecycle production tracked and computable in accounting systems for domestic and foreign transactions alike. The G20 can establish such accounting systems and standardization mechanisms based on improved collaboration between national and sub-national systems for natural capital accounts and through capacity development at regional level in Latin America, Southeast Asia, and sub-Saharan Africa.

Outcomes

Implementation of these recommendations under the leadership of the G20 can help strengthen the social dimensions of bioeconomy – not only by articulating principles of fairness and justice, but also by harnessing the deep and wide productive potential of workers, planners, researchers, and other key actors. Although it is difficult to trace specific outcomes for bioeconomy pathways, due to the heterogeneity in bio-resources and bioeconomy strategies across countries/regions, we can trace the implications of these recommendations by reference to the three UN/Rio agreements: the Convention of Biological Diversity (CBD), the UN Framework Convention on Climate Change (UNFCCC), and the UN Convention to Combat Desertification (UNCCD). The recommendations are in line with several key principles embodied in the conventions and their associated protocols, as identified in Table 2.

TABLE 2: Relation between recommendations in this brief and selected principles in UN/Rio conventions, protocols and agreements

	UN/Rio conventions, protocols and agreements				
<i>Recommendations put forward by this brief</i>	The Convention on Biological Diversity (2011)	Kunming-Montreal Global Biodiversity Framework (2023)	Land Degradation Neutrality principles & Technical Guide (UNCCD 2022b)	G20 Global Land Initiative (UNCCD 2022a)	UNFCCC (1992) & Paris Agreement (2015)
<i>1. Empowering IPLC</i>	Article 1 (key objective) Article 7 Article 12 Article 21	Target 22	Principle 13 Principle 18	Objective 2 Pillar 3	Paris agreement Article 7, Principle 5
<i>2. Diversifying and differentiating</i>	Article 9 (Objective 2)	Target 11 Target 20	Technical guide Pathway 6		
<i>3. Local-empirical and techno-scientific knowledge exchange</i>	Article 23			Objective 2	Paris Agreement Article 10, principles 1,2,3,4 UNFCCC Article 4, Principle C
<i>4. Data, standardization and natural capital</i>		Target 21	Principle 4	Pillar 1	

Source: Authors' analysis

Looking forward to the next G20 that will be led by South Africa, a platform for supporting the sociobioeconomy could be led by pairing a G20 and non-G20 country (recall Table 1) in each of the regions (Latin America, Southeast Asia, and sub-Saharan Africa) to serve as co-chairs in enhancing regional bioeconomy frameworks and cooperation. In this way, the UNCCD/G20 Global Land Initiative would be strengthened at regional levels while the same regional cooperation efforts could be mobilized at the

global level for sociobioeconomy investments in support of biodiversity under the CBD, and for climate resilience and stabilization under the UNFCCC. Such an approach would fit well with the ongoing efforts for linking the three Rio conventions, in this case by taking advantage of the integrative approach of sociobioeconomy to engage and empower underrepresented groups to function as stewards of bio-resources for biodiversity, land restoration, and climate resilience.

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