

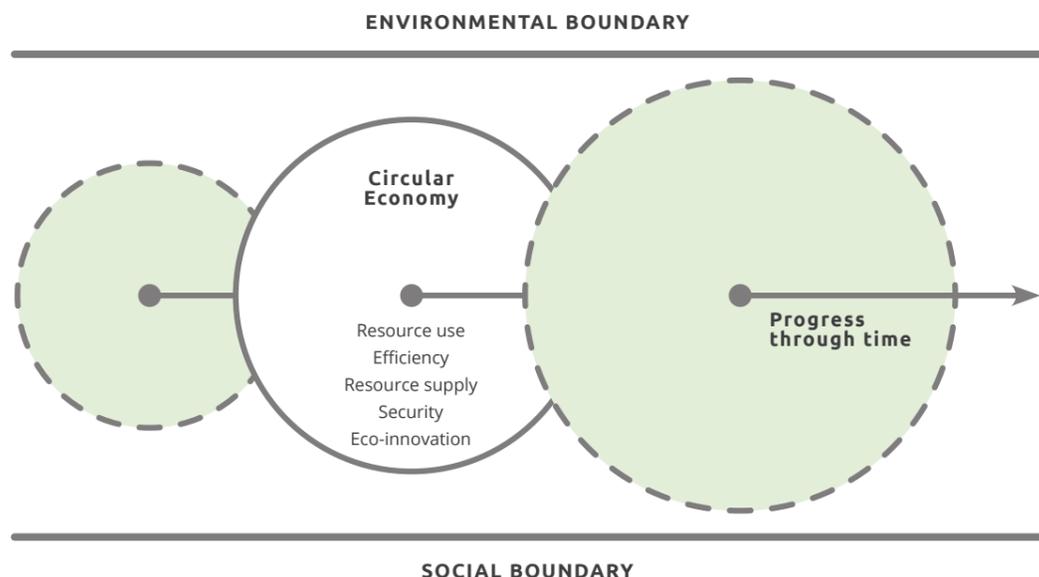
# Policy Briefing

## Bioeconomy opportunities for four Colombian regions



In the light of Colombia's highly biodiverse environment, the stock of wealth or natural capital that this represents provides an excellent basis for a bio-economy development path. Various definitions of bioeconomy exist, but the one supported by this research merges bio-resource (strong sustainability) and biotechnology paradigms (weak sustainability) to enable a development path that recognizes regional and local diversity factors. The overall aim is to promote the production and use of knowledge on biological resources, processes and products (e.g food, fibres), and health products among others to enable bioeconomy progress in Colombia. Land ownership constraints, funding levels, protection of intellectual property rights and overall employment and post-pandemic impacts, all require government attention and actions to design and support successful bioeconomy initiatives. The one-year multidisciplinary Cluster project is funded by the UK Government's Global Challenge Research Fund and aims to support the transition to sustainable bioeconomy prosperity and secure lasting peace in Colombia. The macroeconomic principles, which should underpin bioeconomic progress, as well as the indicators required to assess such progress, are discussed and empirically analyzed in this project. Regional scale analysis is used to identify baseline conditions (via asset checks and cluster analysis) as well as barriers and opportunities for future bioeconomy investment programmes. This initial data-driven evidence is supplemented by an online survey of local stakeholders.

In terms of macroeconomics, an extensive green investment portfolio needs to be stimulated to kick start the economic development process and its transition to sustainability. This large injection of money into the economy is not without its dangers and three particular indicator issues need to be closely monitored: deficits measured as a percentage of GDP need to be below or at the rate of economic growth; the development path created should be in line with sustainability objectives; and the investment programme should aim to reduce inequality in incomes /wealth. Overtime, the green investment programme will need more than initial public and private expenditure stimuli, and revenue raising via green or other forms of taxation will need to be considered.



sustainable bioeconomy potential. The cluster analysis was partitioned into economic, social and environmental categories. Five 'economic' cluster areas were found: a service-led highly developed cluster; a balanced development cluster; the coffee triangle cluster; a rural development cluster and a primary sector-led cluster. The five 'social' clusters were made up of a core central area of Colombia with high levels of education and innovation potential, together with lower levels of poverty. Outside of this core was a more peripheral cluster with higher levels of poverty and lower innovation diffusion. The five environmental clusters more or less mirrored the natural regions of Colombia but with outliers given the mega diverse character of the country and the concentration of human footprints in given areas. This baseline asset check was complemented by a summary of the historical trends in the regions, compared to the national socio-economic and cultural change picture.

The stakeholder survey (167 usable questionnaires) indicated that around 75% of respondents were engaged in biodiversity sectors such as bio-research, ecotourism and forest products, or in agriculture or green chemistry and ecological engineering. Survey respondents ranked bio-research and development as the most important sector for future development in Valle del Cauca, Antioquia and the Coffee Zone. Biodiversity and ecosystem services were the top priorities in Orinoquia. When asked to list the most important needs for a sustainable future bioeconomy in Colombia several economic requirements were highly ranked: the existence of bioeconomy value chains; efficient

An expanded Circular Economy constrained by boundary conditions

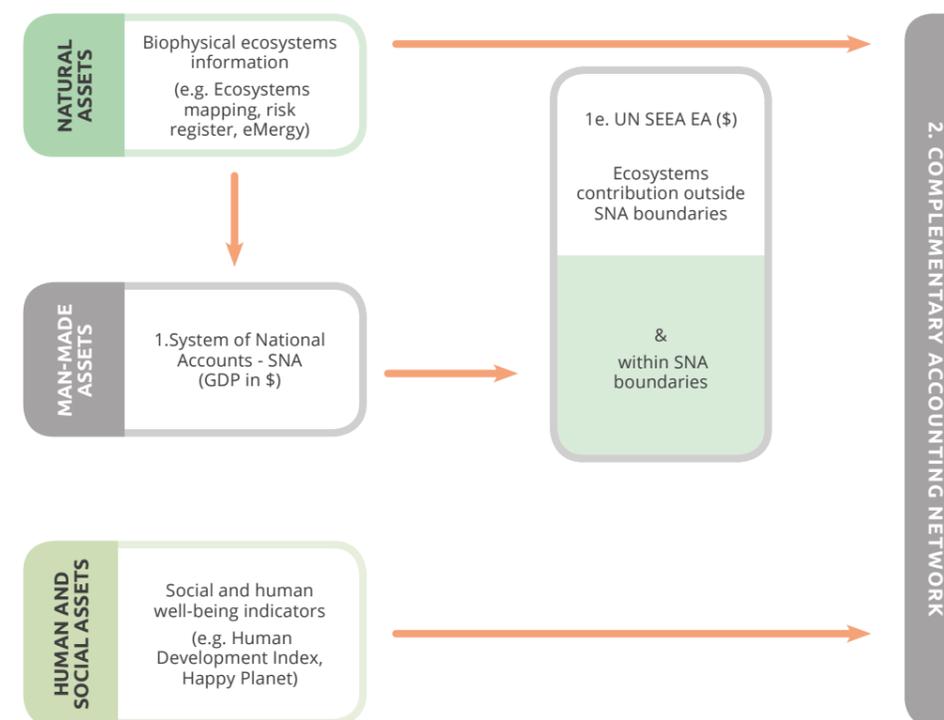
Monitoring progress will require the adoption of the circular economy concept in which the impact of the bioeconomy investments on GDP and the consequent effects on the national capital stock (physical, natural human and social components) are accounted for. The circular economy concept and its growth over time that we have in mind, sits in a 'safe' and 'fair' space between two boundaries. An environmental boundary to protect against significant pollution and resource deletion effects; and a social boundary which guards against loss of wellbeing/culture and increases in inequalities.

A pragmatic approach to the national system of economic accounting is also required, one which encompasses a range of economic growth, wealth and wellbeing parameters. In this report we advocate the use of the CAN (Complementary Accounts Network) to provide the necessary monitoring capability.

Individual bioeconomy projects, policies or courses of action will need to be appraised in terms of their economic efficiency, eco-efficiency (e.g. carbon footprint reduction) and effectiveness, costs and benefits. Careful policy instrument coordination will also be necessary to manage efficiency and inequality trade-offs and to overcome existing regulatory failures. Some of the costs may be the result of unintended consequences such as, for example, so-called 'rebound effects' from increased land use efficiencies. A switch to more productive land use such as from extensive cattle ranching to silvo-pastoral systems could, in certain circumstances, lead to an expansion in land use and a consequently increased threat to intact biodiverse lands such as forests.

Four case study regions, Antioquia, Valle del Cauca, Coffee Zone and Orinoquia, were chosen for the baseline asset check and cluster analysis, together with a stakeholder/network analysis in order to assess a

Complementary Account Network to monitor bioeconomy initiatives (adapted from Turner et al 2019)



public infrastructure; access to R&D capability; improved governance system and new targeted economic and financial incentive instruments. The social needs included better education and workforce training, the existence of creative hubs, and more public market acceptance of bio-products. The protection of highly diverse ecosystems and habitats was considered the most crucial environmental indicator.

Sustainable bioeconomy investments will depend on both local push and a regional/national pull, and need to be enabled through appropriate financial incentives and extensive stakeholder networks and partnerships. The data driven (cluster and survey) analysis revealed both opportunities and challenges for the further development of bioeconomy. The use of both types of analysis must be buttressed by an effective and efficient knowledge transfer process. Key to the success of such a transfer are expanded knowledge hubs and truly participatory networks. These networks must bring together collaborating entities which encompass private business, financial organisations, NGOs and government (local to national).

## Recommendations

The transition to a more bioeconomy based development path in Colombia needs to be both 'measured' (taking full advantage of the evidence base anchored to a comprehensive capital asset check and stakeholder preferences) and regionally diversified building on in situ natural resource endowments.

The success of any bioeconomy strategy will be conditioned by both, the development of an international governance regime to enhance the protection of intellectual property rights including the Access and Benefit-Sharing (Nagoya Protocol, 2014), and the fostering of greater stakeholders coordination.

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## Funders



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For more information visit:

<https://bridgecolombia.org/proyectos/cluster-de-bioeconomia/>