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Sustainable Local Bioeconomies: A Nature-based strategy to bridge Well-being gaps. A Methodological Approach to identify, structure, and develop local Bioeconomies

Bioeconomías locales sostenibles: estrategia de cierre de brechas de bienestar, a partir de soluciones basadas en biodiversidad.

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Abstract

Colombia is recognized as a global food pantry for humanity (Inter-American Development Bank, 2014), due to its natural wealth, while the rates of monetary poverty and food insecurity exceed 40%. The country is not exempt from global crises, such as social, environmental, and economic crises, particularly in terms of poverty, hunger, biodiversity loss, and climate change.

In Colombia, Biodiversity and Ecosystem Services are not "valued" as part of socioecological dynamics at a microeconomic level, nor are they remunerated to support well-being in building Sustainable Local Bioeconomies. Additionally, value is not always added to local Biodiversity, because of lack of knowledge and recognition of its importance, which could explain the contrast of monetary poverty in territories rich in Biodiversity and Ecosystem services. The social, environmental/climatic, and economic crises highlight the urgent need for changes in State intervention and its effectiveness to contribute to the well-being of communities. In this context, the development of Local Bioeconomies is proposed as a strategy to bridge well-being gaps, by utilizing nature-based solutions. Therefore, valuing Biodiversity and Ecosystem Services at the local level is a necessary step to address this issue. This article presents a methodological approach to identify, structure, and develop Sustainable Local Bioeconomies, as a strategy to bridge well-being gaps, utilizing nature-based solutions.

Key words: well-being, Biodiversity, Local Bioeconomies, Ecosystem Services, sustainability.

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Resumen

Colombia es reconocida como país despensa mundial de alimentos para la humanidad por su riqueza natural, al tiempo que los índices de pobreza monetaria y hambre sobrepasan el 40%. El país no es ajeno a crisis mundiales: sociales, ambientales y económicas, especialmente en cuanto a pobreza, hambre, pérdida de biodiversidad y crisis climática. En Colombia, la biodiversidad y los servicios ecosistémicos no están "valorados" como parte de dinámicas socioecológicas, a nivel microeconómico, y no se remuneran, al servicio del bienestar, en la construcción de bioeconomías locales sostenibles. Adicionalmente, no siempre se agrega valor a la biodiversidad local por desconocimiento o no reconocimiento, lo cual podría explicar el contraste de pobreza monetaria en territorios de especial riqueza en biodiversidad y servicios ecosistémicos. La crisis social, ambiental/climática y económica, plantean la imperativa necesidad de cambio en la intervención del estado y en su eficacia para contribuir al bienestar de las comunidades. En este contexto es planteado el desarrollo de Bioeconomías locales como una estrategia de cierre de brechas de bienestar, con base en soluciones basadas en la naturaleza. Valorar a nivel local la biodiversidad y los servicios ecosistémicos es paso necesario para abordar el tema.

Palabras clave: bienestar; biodiversidad; bioeconomías locales; servicios ecosistémicos; sostenibilidad.

Introduction

In Colombia, the incidence of monetary poverty reaches 63.4% of the population in the Department of Chocó and 58.3% in the Department of Cauca, both located in the Pacific region, according to statistics from the Departamento Administrativo Nacional de Estadística (DANE, 2015, 2021) and the Consejo Privado de Competitividad (CPC, 2022). The Banco de la República had already identified the persistence of poverty in the Colombian Pacific (Banco de la República 2016), noting a greater incidence when the analysis focuses on the coastal zone, giving rise to "spatial poverty traps."

Strikingly, although these territories arerecognized for their abundant richness in Biodiversity and Ecosystem Services (United Nations, 2018), they simultaneously register indicators of extreme monetary poverty and low standards of living (Echeverri et al., 2023; United Nations Development Programme [UNDP], 2023).

In Colombia, the policies and practices related to the valuation and remuneration of Biodiversity and Ecosystem Services (BySE) do not reflect a correlation with territorial well-being[2]. These are not recognized as part of socio-ecological dynamics at a micro level, as would be expected (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services [IPBES], 2022), nor are they remunerated to foster the development of a bioeconomy and Sustainable Local community (Ministerio de Ambiente y Desarrollo Sostenible [Minambiente], 2012; Ministerio de Ciencias, Tecnologías e Innovación [Minciencias], 2020, 2022).

Moreover, value is not always added to local biodiversity, due to a lack of knowledge and recognition of its importance (Sánchez, 2016a, 2016b, 2018), which could explain the contrast between the monetary poverty of communities in areas rich in Biodiversity and Ecosystem Services (Departamento Nacional de Planeación [DNP], 2011, 2018, 2021, 2022; Patiño Rodríguez, 2002). As a result, social, environmental/climatic, and economic crises highlight the urgent need for changes in state intervention and its effectiveness (Mazzucato, 2020, 2022; Minciencias, 2019) to address community well-being.

Based on the above, it is urgent to ask the following questions: How can we relate well-being in local communities to the policies and practices of valuing and remunerating Biodiversity and Ecosystem Services in Colombian territories? Why are BySE not valued and remunerated at the local level? Why should they be valued and remunerated? How can they be valued and remunerated to address well-being? How do territorial communities perceive the valuation and remuneration of BySE? How do national-level decision-makers in this field perceive the valuation and remuneration of BySE and its relationship to territorial well-being?

Answering these questions will help us understand how the policies, valuation, and remuneration practices of the BySE in Co-

[2] This issue is raised as part of the author's doctoral research study (in process), in the Doctorate in Government, public policies, and public administration, at Universidad del Valle, Cali, Colombia: Biodiversity for everybody. Valuation and remuneration of biodiversity and ecosystem services and their relationship with well-being, in the territories, in Colombia.

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lombian territories contribute to the well-being of local communities. This research aligns with three key concepts, from the conceptual framework:

- Addressing Socio-ecosystems (ecosystems and ways of living).
- Conducting research based on local dynamics (community-based research).
- Working with and for local capacities integrated into multi-level systems of public policy design and implementation processes.

To address these questions, a thematic mapping and an analytical framework have been developed and are presented in this article.

The development of Local Bioeconomies is identified in this context as a "nature-based solutions" strategy type, specifically focused on Biodiversity and Ecosystem Services, to respond to major territorial challenges. The case studies will focus on local communities in the Colombian Pacific, which will be compared with similar cases in other national and international contexts.

As a result of the research, recommendations for public action and public policy will be proposed. Epistemic communities engaged in this issue will be identified before, during, and after the investigation, and the need and convenience of referential changes at the community level will be anticipated, both in the territories an among public policy designers and decision-makers in the field.

Based on the current progress of the research, this article shares some central approaches that will be addressed throughout the investigation, for discussion and enrichment.

How can we relate the well-being of local communities with the policies and practices of valuation and remuneration of Biodiversity and Ecosystem Services in Colombian territories?

In the academic and political spheres, there is an ongoing debate regarding the advantages and risks of economically valuing Biodiversity and Ecosystem Services, which could deepen the commodification of nature. The TEEB Project (The Economics of Ecosystems and Biodiversity) published its first Report in 2008, aiming to highlight the use of nature in economic decision-making at the international, national, and local levels influencing policy design, public administration, and business (www.teebweb.org). Hosted by the United Nations Environmental Program-UNEP, in Geneva, Switzerland, since 2011, the TEEB Project has contributed to both, theoretical discussions and practical implementation, regarding the assessment of Biodiversity and its Ecosystem Services across various sectors and regions (TEEB et al., 2013; TEEB, 2018).

Several international initiatives are underway, including Colombia's, such as Wealth accounting and the valuation of Ecosystem Services-Waves, led by the World Bank (2019) to promote sustainable development by incorporating natural capital into national accounts (www.wavespartnership .org). Alongside this is the Contaduría General de la Nación (CGN, 2022) application of the International Public Sector Accounting Standards Board (IPSASB, 2022), which has shown an advanced implementation in Colombia, particularly for subsoil natural resources. It is worth noting that the CGN (2022) asserts that the accounting treatment of natural resources must be approached from a non-financial perspective and publishes an annual report on the state of natural resources and the environment (Organisation for Economic Co-operation and Development [OECD], 2009; National Agricultural Biotechnology Council [NABC], 2001; Food and Agriculture Organization of the United Nations [FAO], 2021).

In Colombia the Humboldt Institute has developed a project titled *"Complementary Methods for the Assessment of Biodiversity: An Interdisciplinary Approach"* (Castañeda et al., 2013). Additionally, the Universidad Nacional and Universidad del Valle, in Colombia, proposed and published the initiative "*Towards an Inclusive and Plural Valuation of Biodiversity and Ecosystem Services*" (Rincón-Ruiz et al., 2021, 2023). Colombia has also been a pioneer in this field,with the Constitutional Court protecting biocultural systems, such as the Atrato River

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and the Cauca River, by declaring them subjects of rights (Corte Constitucional de Colombia, 2016; Corporación Biotec, 2007, 2011a, 2011b).).

The publication of "*Methodological Assessment regarding the diverse Conceptualization of Multiple Values of Nature and its Benefits, including Biodiversity and Ecosystem Functions and Services*" (IPBES, 2022), provides various methodologies and perspectives on valuing of Biodiversity and its benefits and Services, especially guiding policy-makers in a period of reexamining relationships with nature in the face of social and environmental crises.

Although Colombia has implemented bioeconomy satellite accounts and an environmental economic accounting at the national level, these efforts remain at the macroeconomic level, without "trickling down" to the territories, thereby excluding community participation (Universidad del Valle & Corporación Biotec, 2020). Recognizing the importance of local governments (Varela, 2015, 2022a, 2022b), and the growing trend of involving communities decision-making that affects their well-being, creates a favorable scenario for the design of public policies in the territory. This also emphasizes the state´s effectiveness in addressing major social challenges and evaluating the outcomes of these policies in local communities (Mazzucato, 2013, 2018a, 2018b; Latour, 2013; Wulf, 2017).

Conceptual Framework

The characterization of the territory, at the local level is approached from the perspective of social, environmental/climatic, cultural, and economic sustainability, and it is shaped by various inter-related components. For the purpose of this study, four components are dealt with as crucial:

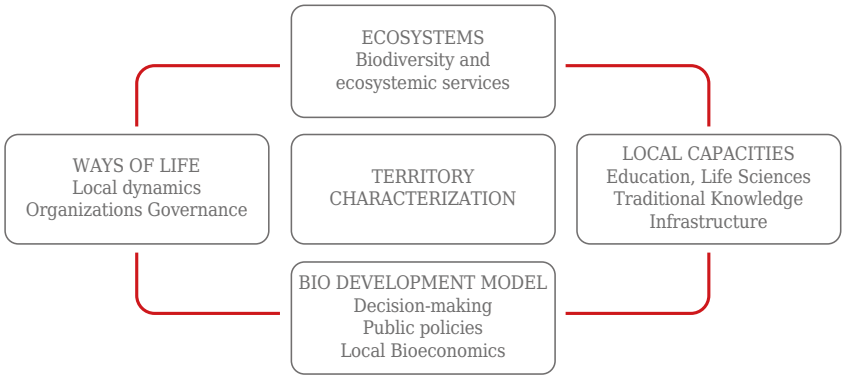
- Ecosystem characteristics of the territory and its conservation: Biodiversity and Ecosystem Services (BySE).
- Quality of life indicators for communities in the territory: Ways of life.
- BIO Model and level of development. Utilization of BySE. Bioeconomies.
- Local capacities: Knowledge of BySE in the territory. Education levels. Life sciences, traditional knowledge, and ancestral knowledge. Access to infrastructure.

In this initial theoretical framework, Figure 1, a mapping of themes identified to address the research questions, from which an exploratory process is developed.

Methodological Approach

The mapping of topics to address the question How to relate well-being in local communities, with the policies and practices of valuation and remuneration of Biodiversity and Ecosystem Services, in Colombian territories? is organized into 4 categories and 13 topics (See Figure 2):

Figure 1. Critical determinants of territory characterization, with criteria of social, environmental/climatic, cultural, and economic sustainability.



Source: Original figure created by the researchers.

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Diversity and Ecosystem services

1. Wild biodiversity.
2. Agrobiodiversity.
3. Industrial.
4. Small scale.

Valuation

5. Monetary Accounting.
6. Socio-environmental.

Remuneration

7. Tax Accounting.
8. Productive. Commercial.
9. Use.

Well-Being

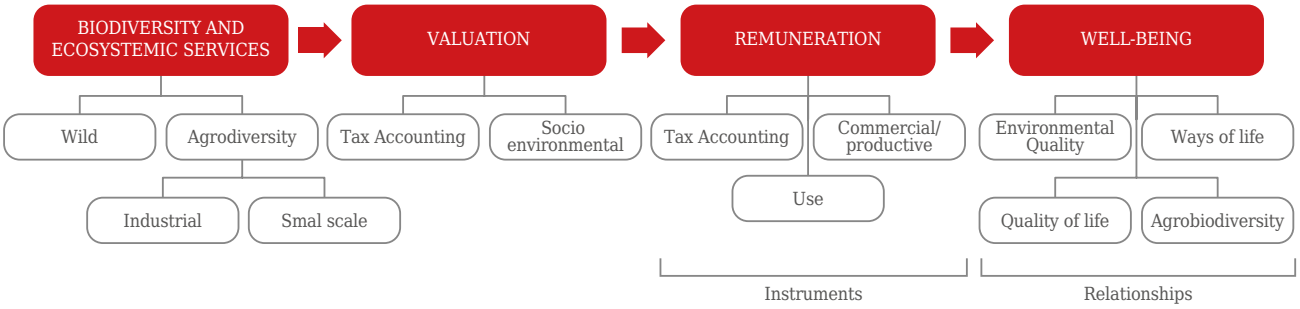
10. Environmental quality.
11. Ways of life.
12. Quality of life.
13. Agrobiodiversity.

This research focuses on small-scale agrobiodiversity (Topic 4), addresses socio-environmental valuation (Topic 6), and the three aspects proposed for remuneration (Topics 7, 8 and 9).

In local communities, within the territory, the study proposes to address well-being references linked to Biodiversity and Ecosystem Services (Sangha et al., 2019).

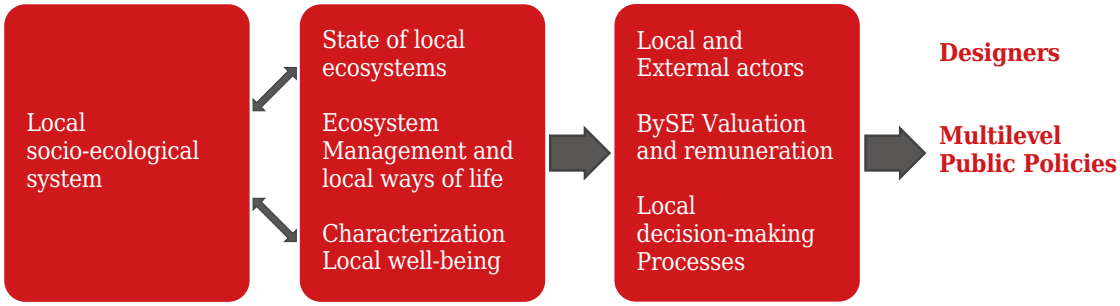
The territorial approach, explicitly related to public policies, valuation and remuneration practices, will be addressed by analyzing the referentials (BySE as assets and natural capital), local public action (dynamics, tools, and decision-making and governance processes), and local capacities (knowledge and know-how-skills), as depicted in Figure 3 and Table 1.

Figure 2. Linking well-being with biodiversity valuation and remuneration



Source: Original figure created by the researchers.

Figure 3. Analytical framework on biodiversity valuation, remuneration, and well-being in Colombia



Source: Original figure created by the researchers.

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Table 1. Analytical framework to explore the expressions of policies and practices of valuation and remuneration of BySE.

Expressions / Interventions	Referentials	Public actions	Capacities
Public policy documents			
Public and private actions			
Institutionality • Governmental agencies • Civil society organizations			

Source: Original figure created by the researchers.

Discussions and Conclusions

The elements presented in the article, aim to initiate a discussion on the concepts included. The references offer a broad range of concepts and proposals to be considered. Additionally, a glossary of the developed concepts will serve as useful complementary information.

The proposal to link local communities with valuation and remuneration of Biodiversity and Ecosystem Services in relation to well-being in Colombian territories, connects local socio-ecological systems which are complex, dynamic, vulnerable, and diverse, under uncertainty conditions.

The joint approach to valuation and remuneration takes into account the observed trends, which focus on deepening evaluation (assessment) and valuation (value) without including remuneration, understood here as monetary and non-monetary incentives for valuation, conservation, use, and production.

This research aims to expand knowledge and understanding, regarding the construction of a reference framework for the valuation and remuneration of Biodiversity and Ecosystem Services in local communities as well as in the institutions responsible for designing, implementing, and evaluating related public policy processes.

The expected benefits of this study, obtained in and with the community, aimed to:

- Build capacities for participation in these processes.
- Provide local communities with access to participate in the cycles and processes of design, implementation and evaluation of public policies and practices for the valuation and remuneration of Biodiversity and Ecosystem Services, in relation to well-being in Colombian territories.
- Build well-being, based on Biodiversity richness and Ecosystem Services within the communities in the territory, in Colombia.
- Among other results, position local flora and its social re interpretation, including the country's Science, Technology and Innovation System. This includes high potential production chains such as chontaduro (*Bactris gasipaes Kunt*), naídí (*Euterpe oleracea*), pipilongo (Piper bogotense), annatto, spicing and medicinal plants, and non-timber forest products, just to name just a few.

Advances in the knowledge and understanding of the valuation and remuneration of Biodiversity and Ecosystem Services in local communities and their relationship with well-being, will contribute to Colombian Bioeconomy strategy, specifically the consolidation of Sustainable Local Bioeconomies, as a strategy to bridge well-being gaps, through biodiversity-based solutions.

5. Conflict of Interest

The author declares no conflict of interest. This article was accepted for presentation as a paper at the 27th ICABR – International

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Consortium of Applied Bioeconomy Research -Conference 2023. The article has not yet been published.

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