



# An Approach to Bioeconomy Public Policy in Colombia

**Hector Heraldo Rojas-Jimenez\***

*University La Gran, Colombia*

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**\*Corresponding author:** Hector Heraldo Rojas-Jimenez, University La Gran, Colombia

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## Opinion

The global context of biodiversity loss and climate change crisis determines conditions that limit the possibility of thinking about access to natural resources as when the industrial revolution was not aware of the finitude of natural resources. At the end of January 2024, Colombia has 34 fire outbreaks, some motivated by global warming, others by criminal hands, and others for ideological purposes, but ultimately all as a representation of the importance of better management of the resource conditions that accompany society. Colombia is the second most biodiverse country on the planet, although in recent measurements, Indonesia is in competition for that second place. In this context, it is recognized as the first country in birds, first country in orchids, second in plants, amphibians, butterflies and freshwater fish. Third in palms and reptiles and fourth in mammals. Due to its continental extension, it is the 26th country in the world, occupying 7% of the planet's land and due to its location in the tropics, which motivates its level of biodiversity (Rojas-Jimenez [1-3]). The National Planning Department of Colombia is the body in charge of formulating policy guidelines from its economic and social policy documents CONPES Documents. In 2018, CONPES 3934 (DNP [4]) established the green growth policy where the bioeconomy appears for the first time in an official document and is defined as the economy that efficiently manages biodiversity and residual biomass to create new products, processes, services with added value, incorporating knowledge and innovation.

Subsequently, the definition of the global Bioeconomy Summit was incorporated, which refers to the bioeconomy as the production, use and conservation of biological resources to provide information, products, services in all economic sectors to advance towards a sustainable economy that incorporates science and technology. It is in that context where the main lines of action of the bioeconomy in Colombia have been recognized

(Rojas-Jimenez, et al. [5,6]). In 2019, the mission of wise men (Minciencias [7]) convened specialists from different disciplines linked to science and, among other documents, produced a complete volume on the study of biotechnology and bioeconomy, recognizing a significant potential in the bioeconomy for Colombia.

In 2020, the CONPES 4021 (DNP [8]) document for the control of deforestation and sustainable management of forests recognized that the bioeconomy from forestry would have the possibility of generating income, jobs, knowledge, and innovation in different productive processes. At the same year it was carried out the launch of the bioeconomy mission for a living and diverse Colombia, which developed a whole series of references that grouped the potential sectors that at the time of CONPES 3934 in 2018 were 17 and on this occasion were grouped into five sectors. 1. Biodiversity and its ecosystem sectors, 2. Colombia Bio intelligent, 3. Health and well-being, 4. Biomass and green chemistry and 5. Productive and sustainable agriculture. These five strategic areas of the bioeconomy mission served to classify additional value-added products and processes that offer a portfolio of possibilities ranging from bioprospecting to nature tourism, payment for environmental services, bio-intelligence, and data science. Essential medicines, biotechnological, phototherapeutic, natural, and bioactive ingredients for food, cosmetics and pharmaceuticals, personalized and translational medicine. Precision nutrition, regenerative medicine, green chemistry, bioenergy and biofuels, bio-refineries and finally sustainable and precision livestock agriculture with agricultural bio-inputs, clean production and conscious consumption and healthy eating (Rojas-Jiménez & Mojica-Godoy [6]).

In 2021, the CONPES 4023 (DNP [9]) document for reactivation, repowering and sustainable and inclusive growth recognized that the bioeconomy had the possibility of offering many conditions

within the framework of post-pandemic economic reconstruction. Finally, in 2023, the current government, from its national development plan: "Colombia, potencia mundial de la vida", (DNP [10], Rojas-Jiménez [11]) established mission-oriented policies where the policy entitled bioeconomy, natural ecosystems, sustainable territory is the first of the five strategic programs of the development plan. Its objective is to promote sustainable territorial development through knowledge, conservation and use of biodiversity and its goods and ecosystem services, considering research and innovation ecosystems as instruments and as an institutional strategic program, innovation and transparency for institutional transformation focused on social and regional convergence. The four additional items within these five missions and strategic programs were the right to food, efficient sustainable and affordable energy, health sovereignty and social well-being, and the science program for peace and citizenship (Rojas-Jimenez, et. al. [12]).

The above, with the purpose of:

- i)** To strengthen knowledge of ecosystems and biodiversity.
- ii)** To define regional priorities and research agenda in Bioeconomy, Biotechnology and Environment.
- iii)** Ensure food safety sustainably increasing production primary school and encouraging changes in guidelines of production and consumption.
- iv)** Promote and manage sustainable renewable natural resources, while guaranteeing the use sustainable, reducing pressure on the environment and conservation biodiversity and soil fertility.
- v)** Reduce resource dependency non-renewable.
- vi)** Mitigate and adapt to climate change, supporting the development of systems production with lower gas emissions greenhouse effect and others.
- vii)** Accelerate the advancement of bio-inventions for the different markets of interest, time that attention is guaranteed appropriate to environmental concerns and health.
- viii)** Develop new jobs highly qualified and training options to meet market demands in different sectors of interest Bioeconomy.
- ix)** Generate financing strategies and establish incentives for investment private sector (Rojas-Jimenez [11]).

Finally, it is worth mentioning the enormous challenges that the bioeconomy faces in expanding its potential. Surely one of the most significant has to do with the lack of infrastructure, the low

level of schooling (research, development, and innovation), the armed conflict and the absence of State presence in those regions where there is greater biodiversity and lack of economic resources [13,14]. To finance the different processes of transformative innovation. The bioeconomy could be very significant, but many adjustments are required at all levels.

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