



SOCIAL METABOLISM AND BIOECONOMY DIALOGUE OF KNOWLEDGE

METABOLISMO SOCIAL Y BIOECONOMÍA DIALOGO DE SABERES.

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Abstract

The general objective of the article is to characterize two analytical categories such as social metabolism and bioeconomy from the perspective of ecological economics as bridges for discussion, critique, and solution of the problems of the 21st century. The methodology is qualitative, the method is a documentary review, and its type is exploratory. The main conclusion is that to solve the problems of the present it is necessary to generate theoretical frameworks such as qualitative and quantitative methods that seek a dialogue of knowledge, since the difficulties that exist are due among other things to the way in which capitalism has mutated for the benefit of large multinationals and not necessarily for human societies with harmful effects on the environment. Therefore, Ecological Economics and Metabolisms are approaches that, being anchored in interdisciplinary discourses, can contribute to generating solutions to problems.

Keywords: *Land economics, market economics, environmental economics, environment.*

Resumen

El objetivo general del artículo es caracterizar dos categorías analíticas como lo son el metabolismo social y la bioeconomía desde la perspectiva de la economía ecológica como puentes de discusión, crítica y solución de las problemáticas que exhibe el siglo XXI. La metodología es de corte cualitativo, el método es de revisión documental y su tipo es exploratoria. La principal conclusión, es que, para poder solucionar las problemáticas del presente, es necesario generar marcos teóricos como métodos cualitativos y cuantitativos que busquen el dialogo de saberes, en virtud que las dificultades que existen se deben entre otras cosas a la forma como el capitalismo ha mutado en beneficio de las grandes multinacionales y no necesariamente para las sociedades humanas con efectos nocivos para el medio ambiente. Por lo tanto, la Economía Ecológica como los Metabolismos son enfoques que al estar anclados en discursos interdisciplinarios pueden contribuir en generar soluciones a las problemáticas.

Palabras Claves: *Economía de la tierra, economía de mercado, economía medioambiental, medio ambiente.*

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I- Introduction¹

The socio-economic systems that have emerged over time have generated changes in the territory and territorialities of societies. One of them, capitalism, has contributed to the unprecedented extraction of materials to increasingly satisfy the growing needs of humanity for at least two centuries (Pinker, 2018). However, the appropriation and uses of natural resources through this economic system have led to serious negative impacts on the environment that raise doubts about the viability of this model and the possible extinction of life as known by human beings. (Maldonado, 2021; Gómez et al., 2021; Infante-Amate et al., 2021; Rockström et al., 2009; Martínez-Alier, 2009; Naredo 2006; 2003).

Indeed, human beings, who have organized themselves into communities or societies have affected and continue to disturb nature in its structure, its evolution, and its dynamics in two ways. On the one hand, through the appropriation of natural resources and environmental services. On the other hand, by excreting and socializing. Since human production, circulation, transformation, and consumption throw waste into the sphere of the natural. Consequently, human beings produce, as they reproduce their conditions of existence from the metabolism with nature, something that according to the conventional economy anchored in the paradigm of modernity in terms of Kuhn does not reach or does not want to see, since the hegemonic economy repeats processes that go against the reproduction of life (Toledo and Alarcón, 2002; Schmidt, 1976).

Therefore, the general objective of this paper is to characterize two analytical categories such as social metabolism and bioeconomy from the perspective of ecological economics as bridges for discussion, critique, and solution of the problems of the 21st century. Because the relations of distribution, production and transformation of goods and services from capitalism, and this taking neoclassical economics as a path has contributed to death, environmental destruction, inefficient income distribution, widespread poverty, etc. (Maldonado 2018; 2014; World Inequality Lab. Global;2018; Ortiz and Cummings ,2012). To do this, it is divided into several sections, beginning with an introduction, followed by the methodology, then the characterization of the two categories, followed by a discussion in which the categories are contrasted with the specialized literature, and ending with some brief conclusions of the research exercise.

Finally, the central hypothesis of this article is that the ecological economy (bioeconomy) and metabolisms are approaches that contribute to energizing and possibly solving the problems of the 21st century, since both are based on strong sustainability (Correa, 2017), the finiteness of planet Earth (Hinkelammert and Mora, 2018) and, consequently, that there is no indefinite economic growth (Latouche 2013). But, above all, both conceive that the dialogues between the transformation, production and distribution of goods and services are focused on the biosphere, not as conventional economics establishes outside of it (González de Molina, 2020; Aguilera et al., Escobar, 2018).

II- Methodology

The methodology is qualitative, and the method is an exploratory documentary review (Gómez et al., 2016). The qualitative methodology aims to describe, interpret, and understand the phenomena or fragments of social reality (Gómez et al., 2021). The documentary review method seeks to explore publications that have been carried out on an object of study to identify the ways in which they have been approached, the state they are in, and the trends of the study (Fernández, 2017; Uribe, 2011). Likewise, being of the exploratory type, the document was a systematization of the results of the study to understand in a general way what is known about it, using a window of observation of 20 years, and researching the categories Bioeconomy, Ecological Economics, and Metabolism in internationally endorsed databases such as Scopus, Wos, Dialnet, and Scielo (Barbosa et al, 2020; Guirao-Goris, 2015; Bollen,2006).

¹ This article is derived from the doctoral thesis in development entitled: Social metabolism of the oil palm agroindustry in the territory of Aracataca Magdalena (1965-2018), in the doctorate of Agrociencias of the Universidad de la Salle, Bogotá, Colombia. Directed by Dr. Jaime Alberto Rendón Acevedo.

III- Results

Metabolism

Social transformations since the advent of the Industrial Revolution in the 18th century have ostensibly reconfigured the relationship between human and non-human animals and their environment (Andrade et al., 2012). The rapid and relentless extraction of raw materials has transformed ecosystems and caused several imbalances, reflecting how the orthodox economy understands nature (Barbosa, Gómez and Leuro, 2016), the overexploitation and depletion of water resources, atmospheric pollution (OECD, 2014a:2014b), the greenhouse effect, acid rain, desertification and erosion, the gradual depletion of mineral resources and fossil fuels, among others (Toledo and González de Molina, 2007, p. 20). Without forgetting that "The progressive destruction of the habitats of animal and plant species, whose survival is increasingly threatened by the unstoppable human desires, is a fact that predicts an irreversible ecological crisis of unimaginable consequences for life on earth" (Muñoz, 2016, p.137).

However, by the end of the 20th century and the beginning of the 21st century, analyses have re-emerged that conceive the need to understand the relationships between social systems and natural systems as a whole and not under a single discourse (Gómez, 2014), such as social metabolism, industrial metabolism, or socio-ecological metabolisms. The first objective of the social metabolism approach of socio-ecological systems is to analyze in an integrated way the relations of society with the nature of a territory. Therefore, the social metabolism is a concept of today, which is perhaps the most powerful theoretical instrument to jointly analyze the relationships between natural processes and social processes (Toledo, 2011, cited in Toledo, 2013, p.42). Noting that "the study of the metabolic network implies the identification of the material flows through all the chains and the exploitation of the dynamics that are developed between units that manage those flows" (González de Molina and Toledo 2001, p. 41).

To summarize, the socio-ecological metabolisms have a line of argument, the human societies, and their relations with nature. At the same time being able to identify the different networks, organizations, structures, and evolutions that agroecosystems experience in certain periods of time, to be compared in terms of sustainability (Gómez, 2021; Delgado, 2014). Similarly, such an approach can be understood under two characteristics: the material dimension, which corresponds to the tangible processes of appropriation, transformation, circulation, excretion of energy and matter; and the immaterial dimension, which configures the social representations of the actors of a territory, intervening both symmetrically and asymmetrically (Toledo and González de Molina, 2007; Gómez, 2020).

Bioeconomy

The bioeconomy was born in the 1960s as a response to the socio-environmental problems posed by the transformation process of capitalism. At first, under the discouraging results of the Club of Rome reports and later with the Brundtland Report. In general terms, these reports reaffirmed the unsustainability of the current economic model, as there is no indefinite growth since planet Earth is finite and is the only place that contains life as humans know it (Mayor, 2009; UN, 1987). However, the pioneer of the Bioeconomy category was the Romanian mathematician Georgescu Roegen, with his seminal work entitled: The law of entropy of the economic process, published in 1971, which later became known as Ecological Economics. Without ignoring that conventional economics will also use the category Bioeconomy for both Environmental Economics and Bioeconomy from the New Economy (Gómez et al., 2018; Carpintero, 2006).

Precisely, the Bioeconomy from the hegemonic discourse of economics anchored in the Neoclassical school is divided into two: Environmental Economics, which seeks to generate exchange value to natural capital through the mathematical instrumentalization of ecosystem services. A phrase that is colloquially coined for this discipline is: "the polluter pays". On the other hand, there is the Bioeconomy from the New Economy, which is divided into two lines of argument and geography. On the one hand, the one represented by the USA, especially in agriculture and genetic transformation. The second is based on stem cells, which are more from the European Union. Likewise, these currents are also based on weak sustainability, that is, they believe that natural capital can supply ecosystem services. For this paper, the bioeconomy is developed from the perspective of ecological economics, which considers that manufactured capital cannot replace natural capital. Hence, Ecological Economics is developed from strong sustainability (Milán y Zúñiga, 2021; Sierra et al., 2019; Vargas et al., 2018; Marinero et al., 2015). In this paper we will take the bioeconomy from the perspective of ecological economics.

Among Georgescu's contributions include his anti-mechanism view of conventional economics, as well as his critique of the "universality" and "timelessness" of normal economics. He argues that analytical categories of developed countries should not

be used linearly in developing countries. In the same way, he criticizes normal economics, including Marxist economics, when they conceive of nature as an inanimate stock, as a resource that does not deserve special treatment. This misconception, which has been proclaimed by Marginalists and Marxists, has contributed to the belief that nature is infinite and that it was meant for human beings. In particular, the author institutes the importance of using the laws of Thermodynamics, especially the law of entropy in economic discourse. Because energy is not lost in colloquial terms but is transformed into dissipated heat that cannot be converted into mechanical work. Therefore, such a category is qualitative and dialectical as opposed to the mechanism of conventional economics (Georgescu Roegen, 1975, 1971, 1970).

IV- Discussion

Metabolism as an approach to socio-ecological systems and ecological economics as a discipline is supported by other knowledge such as biology and thermodynamics. Indeed, they both have categories, concepts, and methods that are more consistent with reality. Since the relationships between economic agents, social actors, or non-human animals are not carried out in an ontological vacuum, much less with the logics of the 19th century as established by the hegemonic discourse of economics since the neoclassical school. On the contrary, both conceive that life is the principle and guide of the distribution, transformation, and production of goods and services. Because humans before being social beings are biological beings that must be channeled into the cycles of life, and any change in the territory and territoriality affects both the landscape, the biotic and abiotic beings that coexist.

In the same way, interdisciplinary approaches are currently fundamental to understanding the relationships between society and nature (Losada and Trujillo, 2017). Because social metabolism and ecological economics are constructed and nourished by methodological tools such as the analysis of material and energy flows, with which the materiality and immateriality of interrelationships can be dimensioned. However, one of its greatest contributions is its permanent dialogue with ecological urbanism, the new rurality, political ecology, environmental history, knowledge obliterated by reductionist discourses, etc. (Maldonado, 2017; Reina, 2013; Martínez-Alier, 2008; Gómez, Vargas, and Posada, 2007; Georgescu-Roegen, 1994).

To conclude the section, this paper agrees with the postulates (Henry et al., 2017; Rangel et al., 2015; Henry et al., 2014; Hodson de Jaramillo and Chavarriaga-Aguirre, 2014) when they state that the Bioeconomy from the conventional discourse of economics is developed under green growth, environmental accounting, and sustainable development. Similarly, it agrees with the postulates of (Pavone, 2012; Passet, 1996) when they state that the aforementioned is how capitalism has mutated to maintain itself without changing its methods, its analytical categories, and therefore revitalizing chrematistics that on average do not contribute to empowering life, but to reducing it to a cost, to short-term utility, etc. It is also in line with the postulates of (Milán and Zúniga, 2021; Gómez and Rincón 2018; Rangel et al., 2015) when they state that the Bioeconomy from the normal economy is an economically viable tactic for Latin American countries, due to the diversity in natural capital that these territories possess and their possible added values.

V- Conclusion

The social metabolism of socio-ecological systems is an increasingly persistent approach to analyzing the problems of the 21st century due to its capacity to generate dialogues between knowledge, understand how to solve the crises at the planetary level and the dynamics that have occurred since the Industrial Revolution, and the linear view of the conventional discourse of economics. Precisely, the latter needs to debate and broaden the approaches with which it analyzes its object of study, since orthodoxy has not been able to contemplate and generate solutions.

Ecological economics, due to its conceptual richness as well as its analytical instruments, is a way to understand the importance of socio-ecological systems and at the same time is a tool that contributes to the dialogue between knowledge, since it draws on thermodynamics and biology to perform economic analysis.

In order to solve the problems of the present, it is necessary to generate theoretical frameworks such as qualitative and quantitative methods that seek a dialogue of knowledge, since the difficulties that exist are due, among other things, to the way how capitalism has mutated for the benefit of large multinationals and not necessarily for human societies, with harmful effects on the environment. Therefore, Ecological Economics and Metabolisms are approaches that, being anchored in interdisciplinary discourses, can contribute to generating solutions to problems.

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