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THE ECONOMY AND THE ENVIRONMENT IN DEBATE: LIMITS AND POTENTIAL FOR A NEW SCENARIO FOR SUSTAINABLE DEVELOPMENT AND OBJECTIVES

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ABSTRACT

Objective: This article is a theoretical essay that presents the limits and potential of the economy in internalizing social and environmental costs, in order to try to recover the reflections on the discussion of the relationship between the economy, the environment and sustainable development.

Method: In terms of methodological aspects, the research is classified as a bibliographical study, in which the source of data was obtained through secondary data, periodicals, books and other documents, the aim of which was to seek a deeper discussion of sustainable development.

Results: For a long time in human history, economics has sought to achieve the status of a science through mathematical models. However, economics is immersed in the social dimension and the environmental dimension, as it uses natural resources as an input for the production process and human activities.

Conclusions: In addition, it presents the trajectory of the concept of sustainable development and the accumulated contributions from world conferences to a reflection on eco-development as a new path for balanced economic growth. This essay points out that it is possible to establish an intersection between the environmental, social and economic dimensions in promoting innovative dynamics of development and sustainability, as pointed out in Rifkin's experience of the Third Industrial Revolution, the ONU contribution to contemporary times with the 2030 Agenda with the Sustainable Development Goals (SDGs) for the whole of international society.

Keywords: Sustainable Development; Economy; Sustainability.

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1 INTRODUCTION

At the beginning of the 21st century, it is clear that the social costs of unbridled growth have caused countless problems. These include pollution, the production of waste and residues of all kinds, climate change, the scarcity of renewable and non-renewable natural resources, energy shortages and other problems. This article is a theoretical essay that presents and analyses the limits and potential of the economy in internalizing social and environmental costs, seeking to recover the first reflections on the subject and the trajectory of the concept of sustainable development.

For Ramos (1981), conventional economics has become increasingly negligent when it comes to environmental deterioration, the exhaustion of energy reserves and non-renewable sources of natural resources. To this end, a broader discussion in search of a transformation of production and consumption habits and practices is essential. It is clear that the environmental dimension imposes limits on production and consumption, so strategies and new alternatives must be developed to take the ecological aspect into account (SACHS, 1986; SACHS, 2002). The lessons of Kapp (1983) and Georgescu-Roegen (1986) may be relevant for thinking about the integrated production systems idealized by Sachs (1986) as an alternative to minimizing losses in production systems.

All this discussion about the challenges posed by socio-environmental problems has led to the emergence of economic alternatives at the beginning of this century, based on what Rifikin (2012) has called the Third Revolution. In this sense, the contributions of the internalization of the environmental problem idealized by Kapp (1983) and Georgescu-Roegen (1986), added to the perspective of eco-development and the innovations of Rifikin (2012) demonstrate the possibilities for the economy and the market to meet the constraints and pressures of the labour market, the consumer market and the environment. Therefore, looking at the picture described above, it is still possible to recognize and reconcile economic strategies with social and environmental perspectives.

As for the methodological aspects adopted to construct this essay, they are based on a qualitative approach, based on a selective review of the relevant literature. The research is exploratory in nature, with the aim of seeking a more in-depth discussion of sustainable development. The article's methodology was based on bibliographical research of nationally and internationally renowned works, and data was collected from secondary sources.

This article has been structured in such a way that the first section deals with the birth of the issue of economics and the environment; the next section presents the historical context of sustainable development, the relevant concepts related to the topic, as well as the contributions and experiences accumulated from world conferences on economics and the environment. The fourth section presents the potential and limits of the economy from the perspective of the environmental dimension, through Jeremy Rifkin's contribution on the Third Revolution and the UN's contribution on the presentation of the Sustainable Development Goals in the role of social organizations (JANNUZZI; CARLO, 2018). Finally, the main conclusions of the study are presented.

2. The birth of the discussion on economics and the environment: the perspective of Kapp, Georgescu-Roegen

Georgescu-Roegen (1906-1994) was the first to denounce the fact that the conventional model of the economy is based solely on the flow of capital, reducing the reality of the economy to a few variables to be measured by mathematical models, in order to fit the parameters of mechanics (CAVALCANTI, 2010). Georgescu-Roegen (1971), in his book The entropy law and the economic process, observes that the economy, since it obeys the law of entropy, should therefore be seen as an entropic flow of energy and materials, which crosses the economy itself and economic history. This perspective had been corroborated by Karl Willian Kapp since the 1950s.

As Cavalcanti (2010) points out, economics, as a traditional science, does not consider the relationships that may exist between the ecological system and the activities that represent the core of any economic system, i.e. production and consumption. In this way, there is no consideration or concern for the trade-offs or the resulting wear and tear.

Georgescu-Roegen's contributions to the inclusion of concern for nature later culminated in debates on Ecological Economics, as pointed out by Cechin and Veiga (2010). Ecological economics considers humanity's economy within a broader ecosystem (ALIER, 1998). Therefore, for the economy to work, the correct input of energy and materials is necessary so that they don't contaminate the Earth with any waste (ALIER, 1998).

From this perspective, the German economist Karl William Kapp, a pioneer in the approach to the relationship between development and the environment and one of the inspirers of political ecology, coined the term Ecosocioeconomics (KAPP, 1963), which was later

taken up by Ignacy Sachs. Among his contributions, the example of modern agriculture is relevant for exploring the potential and portraying the limits of the economy.

Agriculture under the current planting system plays a major role in environmental degradation, as the use of large areas to plant monocultures such as corn and soy generates worrying problems: it attracts many pests and weakens the soil. To resolve this situation, two alternatives are used: the indiscriminate use of pesticides on large areas and large quantities of fertilizers to correct the soil between plantings. Agriculture has thus become a huge industry that drives an immense sector: machinery, cutting-edge tools, pesticides, etc. As a result, these industries need more and more electricity and oil, and are moving towards unsustainability. The use of oil and the excessive use of chemical fertilizers are subject to a fall or halt in growth (KAPP, 1983). This whole production model is eminently degrading and harmful to the environment.

The criteria for exploiting resources, based on this example of modern agriculture, must be reviewed from the point of view of an economic theory that does not only take into account a pillar based on the game of loss and gain. It is important to emphasize that there is an important dynamic interaction between social systems and specific ecological systems. Is it possible to think that we will return to classic agriculture without the use of pesticides and act as if they didn't exist? The answer is no, because this idea is unfeasible in modern agriculture. However, alternatives can be explored, there is technology available, but political will is needed. For example, the use of various types of crops in the same space, avoiding monoculture which attracts pests in large numbers, could be an alternative; as well as the use of natural predators, the use of organic fertilizers to fortify the plant without the need for chemical products; adopting the rotational planting system again, avoiding soil depletion; among other alternatives (KAPP, 1983).

William Kapp and Nicholas Georgescu-Roegen therefore began the discussion of the relationship between economics and the environment, laying the foundations for ecological economics. These two authors were the fruit of the so-called science of the time, influenced by systems theory. They criticized economics for being a closed-system science, because there were losses that were not internalized by productive systems. The reflection on the possibility of opening up the circular flow of the economy and creating integrated production systems, which these authors revived, can be exemplified when the waste from the production system is used to feed back into the system itself, an aspect reinforced by Sachs (1986) and the studies of Vieira (2006).

3. The contributions and experiences accumulated since the world conferences on the economy and the environment: reflection on eco-development as a new path to balanced economic growth

Based on the discussions of authors such as Kapp and Georgescu-Roegen, various other authors began to highlight the limits of the economy and internalize social and environmental costs. Until the early 1960s, development was associated with economic growth, as industrialization had driven the development of the few rich nations up to that point. In addition, the market served as the main reference for the process of allocating resources, i.e. an increase in exchange activities and the special expansion of the market were equated with development (RAMOS, 1981; BIZARIAS, 2024.). Thus, until then, the concept of development did not internalize social costs and did not consider the environmental dimension.

Socio-environmental issues emerged in the field of development planning at the end of the 1960s and the discussion on the subject initially served the interests of the industrialized countries. The priority agenda included the problems of environmental contamination and degradation and the possible depletion of natural resources, aggravated by evidence of exponential population growth. In the following decade, the focus began to shift towards incorporating North-South asymmetries and the phenomenon of "poverty pollution" (SACHS, 2007). From then on, the sustainability criterion came to encompass socio-economic, socio-cultural, socio-political and socio-ecological dimensions and has become a determining factor in the design of alternative rural and urban development strategies.

Among the first international events relating to the debate on the environment was the Founex Report, which pointed out the main topics relating to environmental problems, rejecting the reductionist approaches of ecologism "at any price" and narrow economism (SACHS, 1993). These debates were a preparation for the United Nations Conference to be held in Stockholm in 1972. For Sachs (1992, p. 07) "the most useful lesson that emerged from Founex, and then from Stockholm, is that it would be possible to imagine a path of development that was at once socially useful, ecologically prudent and met the criteria of economic efficiency".

Thus, realizing the limitations imposed by environmental constraints, Ignacy Sachs expanded and developed the concept of Ecodevelopment, in which he combines the economic dimension with the context of social development and environmental protection and preservation, tending to think of an intermediate path for economic growth, in other words,

not emphasizing "zero growth" or "growth at any price". It also presents a series of normative aspects and alternatives to conventional development, based on the convergence of economics, ecology, cultural anthropology and political science (SACHS, 1986). The term Ecodevelopment, as a new path to economic growth, was first used by Canadian Maurice Strong.

The classic contribution by Ignacy Sachs (1993) distinguishes five dimensions of the concept of sustainability: i) Social sustainability, related to the construction of a new civilization of being, as opposed to the civilization of having); ii) Economic sustainability, "made possible by a more efficient allocation and management of resources and by a regular flow of public and private investment. [... economic efficiency must be assessed in macro-social terms rather than solely by means of micro-corporate profitability criteria"; iii) Ecological sustainability, to be achieved through ingenuity in the use of the potential resource base existing in the various ecosystems, limiting the consumption of non-renewable resources and easily exhaustible products and replacing them with renewable resources; reducing pollution through the systematic recycling of waste from production and consumption activities; combating the superfluous consumption of goods; research into clean technologies and finally defining rules for environmental protection, as well as an institutional apparatus to ensure compliance with the proposed standards; iv) Spatial sustainability, in the sense of the progressive improvement of rural-urban configurations; and, finally, v) Cultural sustainability, related to the "[...] search for the endogenous roots of modernization models and integrated rural production systems, privileging processes of change within cultural continuity and translating the normative concept of eco-development into a plurality of particular solutions, which respect the specificities of each ecosystem, each culture and each location" (SACHS, 1993, p. 27).

The United Nations Conference on Environment and Development, held in Stockholm, Sweden, in 1972, was a milestone in discussions on the global environmental issue. At that time, warnings about the risks of unbridled exploitation of natural resources were emphasized (BARBIERI, 2007). The term "sustainable development" was first discussed in 1980 by the International Union for the Conservation of Nature and Natural Resources (IUCN) in the document World's Conservation Strategy, which defines the social, environmental and ecological dimensions as components of sustainability (IUCN, 1980). In 1987, the Club of Rome launched the Brundtland Report (Our Common Future), which states that sustainable development is the ability to meet the needs of the present without compromising the ability

of future generations. In this way, the 1970s and 1980s were important in that they led to conceptual progress, expanding empirical knowledge about the functioning of the biosphere, about the risks of human activities, as well as advancing the institutionalization of concern for environmental planning and management (SACHS, 1993).

Subsequently, the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992 was an attempt to bring together all the countries of the world to discuss the important role of sustainable development. The conference also became known as Eco-92, Rio-92 or the Earth Summit and gave rise to documents such as Agenda 21 and the Declaration of Principles on Forests. Twenty years later, Rio+20 brought a new discussion on renewing the political commitment to sustainable development, proposing changes in the way the planet's natural resources are being used.

It is important to note that for Sachs (2008) economic growth is a necessary condition for development, however, it must be rethought in order to minimize negative environmental impacts and be placed at the service of socially desirable objectives. For Amartya Sen (2000), the aim of development is to promote and expand freedoms (broadening human capacities), creating an environment conducive to people enjoying long, healthy and creative lives, because people value achievements that do not come in the form of income, such as greater access to knowledge and better nutrition.

The market serves as the main reference point for the resource allocation process, i.e. the increase in exchange activities and the special expansion of the market equate to development (RAMOS, 1981), but it is necessary to review the traditional concept of development and broaden it to internalize the social costs and environmental dimension of development.

For Ramos (1981), the paraeconomic paradigm involves a conception of production and consumption that takes into account both paid and unpaid activities, so as to be an alternative to market-centered systems. Guerreiro Ramos defines the paraeconomic paradigm as an "approach to the analysis and planning of social systems in which economies are considered only as part of the whole social fabric" (RAMOS, 1981, p. 181). This includes environmental concerns about finite resources, the disorder of the labor market, which is incompatible for everyone, and the disorder of the consumer and producer market.

It is well known that in order for the market system to continue operating, it is necessary to use natural resources. However, non-renewable natural resources are finite and can be

decimated in the long term. The alternative is to use technology to our advantage, looking for alternatives that use the losses of the production system, the waste, to feed back into the system.

Understanding this problem has been interpreted by many as a limitation and impediment to growth.

However, instead, it is necessary to add ecological and psychological dimensions to the sources of resources, in other words, to include "dimensions for which the mechanistic epistemology inherent in the classical law of supply and demand is not sustainable" (RAMOS, 1981, p. 181).

The limits to current market activities (unbridled exploitation of resources) do not necessarily represent limits to growth and the idea of zero growth. There is an abundance of resources and considerable productive capacity that remain idle due to the lack of an adequate theoretical scheme for organizing this potential, because from a paraeconomic point of view, resources are infinite and there are no limits to growth (RAMOS, 1981).

> *The thesis of limits to growth may well represent opportunities to reveal a vast horizon of possibilities for an explosion of growth, both in terms of production and consumption. To make these possibilities a reality, individuals, institutions and governments need to rid themselves of the conceptual blinders inherent in market-centered allocation models (RAMOS, 1981, p. 181).*

One of the objectives of paraeconomic policies, and therefore seen as a potentiality of the economic system, is the ability to balance the allocation of resources. According to Ramos (1981), this does not mean that efforts should not be made to develop the market in a given country, but rather that market development should be politically regulated, so that the improvement of a nation's general economic conditions is compatible with what is considered a dual economy.

That is, the coexistence of borrowing-oriented systems, in which the respective members produce for themselves a large part of the goods and services they directly consume, and profit-oriented systems, in which the members are job holders, who draw from their salaries the purchasing power that will provide them with all the goods and services they need. Borrowing-oriented systems and the barter sector are therefore not mutually exclusive (RAMOS, 1981).

The production of goods and services should be promoted through the maximum use of renewable resources and the minimum reasonable use of non-renewable ones. There are two types of resources available. They are:

> *Renewable: of a biological nature that can be reproduced within relatively short natural cycles, such as the energy received from the sun and the kinetic energy of wind and falling water; Non-renewable resources: such as oil, lead, tin, zinc, mercury and other minerals whose reproduction, if possible, would require long ecological cycles, which makes them practically unavailable within the time limits of humanity's existence (RAMOS, 1981, p. 191).*).

The para-economic paradigm proposed by Ramos (1981) therefore takes into account external social and ecological aspects and should be seen as an alternative to the classic locative models, because if the use of non-renewable resources continues at the current rate, humanity will soon be deprived of their use. For the author, a worldwide organizational evolution is necessary to overcome the physical deterioration of the planet and make the conditions of human life possible. After all, if economic organizations influence human existence as a whole, they should be redesigned to understand environmental interests (BIZARRIAS, 2024).

Within the idea of an economy located in a broad, multidimensional system, as proposed by Ecological Economics, Ramos (1981) points out that the quality and development of a society does not result solely from the activities of these market-centered systems, but rather from a systemic view of society. The allocative model, in which the market determines what should be considered resources and production, is no longer sufficient, since the citizen who attends local church meetings without being paid for it is not considered a resource. In peripheral countries, for example, people who work as peasants from a conventional point of view are not considered productive, because the product of their activities is not marketed. Thus, there is a gap in this important source of non-formalized resources (SARTORI; LATRÔNICO; CAMPOS, 2014; VELENTURF; PURNELL, 2021).

4. The contributions of Rifikin's discussion on the third revolution

In addition to modern industrial agriculture, the first and second industrial revolutions contributed to the depletion of the planet's natural resources. Jeremy Rifkin (2012) points to a third industrial revolution that is to come and that will have a major impact on the 21st century, causing a profound change in people's work and lives. Rifkin (2012) is therefore talking about a new perspective called the third revolution, indicating how the economy should look at what exists in terms of potential in the environmental area, such as what new sectors could emerge and generate a new job market.

The third industrial revolution, according to Rifkin (2012), is based on five pillars:

1. Transforming each continent's assets into energy micro-generators to collect renewable energy on site;
3. The use of hydrogen and other storage technologies in all buildings and infrastructure to store intermittent energy;
4. The use of internet technology to transform the continent-wide electricity grid into an energy-sharing network that acts like the internet;
5. Transitioning the transportation fleet to fuel cell or electric vehicles that can buy and sell electricity on an interactive, continental, intelligent electricity grid.

These pillars form the infrastructure for a new economic system that can lead us to a green future. The function of these five pillars forms a conjuncture of insoluble technologies, a system with properties and functions that have qualities different from the sum of its parts. The synergy between the pillars creates a new economic paradigm that can transform the world (RIFKIN, 2012; ALMEIDA CARLOS, 2024).

History shows us that several advanced or developed societies have gone into complete decline because they were only concerned with the short term and were unsustainable over the years. The possibility that the world is on its way to total destruction, however, was not an option before; weapons of mass destruction added to climate problems increase the chances in favor of an end point for our entire species. In this way, the third industrial revolution becomes an option for changing the future that awaits us (RIFKIN, 2012).

Faced with the limits and social costs imposed by the traditional economy, organizations can also contribute to the sustainability of the planet. For Barbieri, a sustainable organization is one that introduces "innovations that meet the multiple dimensions of sustainability on a systematic basis and reap positive results for itself, society and the environment" (BARBIERI, 2007, p. 105).

Companies want to remain in the market for decades, so they need to adopt strategies to enable their long-term development. The way to achieve this sustainability is through social and environmental actions that preserve the market in which they operate, considered from a multidimensional perspective (BARBIERI; SANTOS, 2020).

As set out in the concept of sustainable development, the innovations of social organizations must cover the environmental, economic and social dimensions, i.e. they must generate positive economic, social and environmental results at the same time, like the

Sustainable Development Goals (SDGs) (SEVERO; GUIMARÃES; SILVA OLIVEIRA, 2022; SOUSA; FONTENELE; SANTOS, 2023).

5. The UN's contribution to contemporary sustainability with the Sustainable Development Goals (SDGs)

The Sustainable Development Goals, also known as the SDGs, are part of a global agenda with 17 goals and 169 targets aimed at building a fairer, more prosperous, sustainable and equal world by 2030. Approximately 200 nations have made commitments to the SDGs and, in order to really put the goals into practice, governments need the support of companies, which must also commit to reducing their impact on the environment and society (UN, 2015).

The importance of the SDGs lies in strengthening the culture of environmental and social sustainability in governments and companies and, in the corporate world, these goals make business more efficient, responsible, transparent and competitive (UN, 2017). By adopting a methodology to comply with the SDGs, companies play an important role in mitigating the risks imposed on the environment and natural resources, as well as contributing to health, well-being and quality of life on the planet (HE; MIAO; WONG; LEE, 2008; LIU; NDUBISI; LIU; BARRANE, 2020; ROCHA; LOPES, 2023).

Being part of this Global Compact means taking urgent action to conserve natural resources, curb climate change and adopt more sustainable production patterns. Seconci-Rio was the first Seconci in Brazil to make this commitment to the SDGs in 2017, going hand in hand with development. In times of ethics and compliance, the aim is to improve processes in order to offer services in the best possible way, reaffirming its status as a defender of policies that guarantee workers' health and safety (ONU, 2017; DING, 2021; PATEL, 2023).

The Sustainable Development Goals were drawn up from a universal perspective, reflecting the aspirations of various nations around the world and thus representing an important opportunity to build a global path with environmental and social balance (ONU, 2017).

Adopted in 2015, the SDGs were created at a meeting of heads of state and government at the United Nations headquarters in New York. It was a historic decision by UN member countries to join forces in favor of a Global Agenda for Sustainable Development, which must be fulfilled by 2030 in order to end poverty and world hunger, build a more peaceful world,

reduce inequalities, promote human rights, protect the planet and its natural resources and have the SDGs contribute to international cooperation.

6. FINAL CONSIDERATIONS

Since the 1960s, development has largely ceased to be seen as a rational issue involving only market exchanges, as proposed by traditional economics, and has come to encompass social and ecological dimensions (VANHULST; BELING, 2018). The trajectory of the concept of sustainable development demonstrates the concern of nations in relation to the issue and the inclusion of sustainability in commercial practices (RIBEIRO et al, 2023).

The lessons learned from the ecological economics of Kapp (1963; 1983) and Georgescu-Roegen (1971) should inspire new policies aimed at the sustainable development of the planet. Since, in order for the social and environmental dimensions to effectively go hand in hand with economic growth, it is necessary to develop strategies and alternatives for harmonizing the economic, social, environmental, cultural and political dimensions of development (SACHS, 1986; ZUBERMAN, 2020).

This article defends the thesis that the market can be an important instrument of renewal for sustainable development. Growth is essential for development. However, new possibilities need to be discovered to tackle the limits imposed by the current economic model, such as alternatives for dealing with non-renewable resources like oil and coal (PENGUE; MORELLO; RODRÍGUEZ, 2018).

The paraeconomic paradigm proposed by Guerreiro Ramos, the agricultural production alternatives presented by William Kapp and the third industrial revolution postulated by Jeremy Rifkin, as well as sustainable organizations, make up the potential and possibilities of the economy for a new perspective on sustainable development.

Thus, the delimitation of the market system, as advocated by Ramos (1981), involves the formulation and implementation of new allocation criteria and policies within and between nations. Therefore, more than a current analysis of the ecological distortions resulting from the practice of classical economics is needed in order to reorient the process of resource allocation at a global level (Noronha, Silva, Rodrigues, Valente & Souza, 2021).

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