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DIVERSITY OF ECOLOGICAL ECONOMICS AND DEGROWTH THEORY: FOCUSING ON THE RELATIONSHIP BETWEEN THERMODYNAMIC LAWS AND VISION

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Abstract: The degrowth theories in ecological economics can be divided into two flows: Georgescu-Roegen and S. Latouche versus K. E. Boulding, H. E. Daly, and T. Jackson. The former rejects growth entirely, while the latter accepts some growth. Different views on environmental issues and interpretations of thermodynamic laws lead to these distinct theories. This paper will analyze and compare both.

Keywords: Ecological economics, degrowth, vision, thermodynamic laws.

1 INTRODUCTION

Environmental issues in economics are seen as inefficiencies from lacking property rights over nature, causing misapplication of market principles known as externalities. Environmental economics seeks solutions by proposing mechanisms to apply market principles to the natural environment (internalizing externalities) to create a balance between growth and the environment. This process is viewed as a path to sustainable development and is rooted in neoclassical economics, often referred to as neoclassical environmental economics.

However, discussions about environmental issues also include ecological economics, which critiques mainstream economic theories and environmental economics for failing to provide real solutions. The main difference between these two fields lies in their views on how the natural environment impacts human economic activities. Mainstream economists argue that depleting non-renewable resources can be replaced with artificial resources (capital), while ecological economists contend that this substitution is only partially possible and overall, not sustainable.

Ecological economics developed from the ideas of Georgescu-Roegen and Boulding, leading to the formation of the International Society for Ecological Economics in 1987 and the launch of the journal Ecological Economics in 1989.

Solow pointed out the seriousness of environmental problems, suggesting that scarce natural resources could be entirely replaced by capital [1], a view questioned by Georgescu-Roegen based on thermodynamic laws [2]. The journal hosted a debate in 1997 between proponents from both sides regarding the substitutability of natural resources, with ecological

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economics emphasizing the complementarity between natural and artificial resources. Ecological economics, unlike mainstream economic theories or environmental economics, emphasizes the complementary relationship between natural resources and artificial resources rather than assuming the possibility of substitution or recognizing substitution relationships [3]. If substitutability between natural resources and artificial resources is not recognized, then the importance of environmental constraints must necessarily be understood differently from mainstream economic theories. In this context, ecological economists judge that mainstream theories are insufficient to resolve environmental issues and therefore attempt a new approach.

Recently, the concept of degrowth has gained traction within ecological economics, which advocates for a balance between growth and the environment. Degrowth challenges the need for constant growth, leading to varied views on its implications. The term originated from a 1972 article in France [5] and was popularized in the 1st Degrowth Conference in 2008. The MAUSS group leads the degrowth movement, critiquing modern society's utilitarian values [6].

Although Georgescu-Roegen did not mention degrowth directly, his writings were compiled by the MAUSS group in 1979 in a book called "Degrowth: Entropy, Ecology, Economy. " Some believe that the "Limits to Growth" led to Daly's steady-state economics in the 1980s and 1990s. In the early 2000s, the MAUSS group in France helped promote degrowth discussions, especially with Jackson's report for the UK Sustainable Development Commission [7]. Discussions on degrowth in ecological economics can be divided into two paths, leading to differing views on sustainable development. In the former, degrowth leads to a complete rejection of all development or growth [8] while the latter does not. In the former context, degrowth is seen as an alternative to surpass sustainable development, whereas in the latter, degrowth is regarded as a means to achieve sustainable development on a global level. This highlights the significant differences of opinion surrounding the concept of sustainable development within ecological economics.

2 METHODS

What accounts for these differences, and what implications do they hold for understanding the characteristics of degrowth theories within ecological economics? This paper starts from such questions. It will first examine the differences between the two degrowth theories and then confirm these differences through Schumpeter’s concept of vision. Subsequently, it will explore how the theoretical and practical implications of the two degrowth theories can be understood in light of the history of economics or current environmental issues.

3 RESULTS

Sustainable development aims to create a balance between economic growth and the environment. This idea was introduced in the 1987 report "Our Common Future" by the World Commission on Environment and Development. The concept of balancing growth and environmental needs was earlier discussed in the book "Limits to Growth," which suggests ways to limit economic growth based on environmental restrictions. This viewpoint draws on Malthus's ideas about balancing population growth with food supply, leading to the classification of the Club of Rome as neo-Malthusian [9].

Neo-Malthusians expand Malthus's concepts to include the relationships among population, the environment, and economic growth. They argue that unlimited population or

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economic growth can threaten society. Consequently, they advocate for balanced or zero growth as a solution to environmental issues. Both "Limits to Growth" and "Our Common Future" reflect this neo-Malthusian approach.

However, historical economic thought suggests that the need to limit economic demands for environmental reasons is not exclusive to Malthus. Most classical economists, unlike neoclassical ones, share similar concerns and reject the idea of infinite growth. They propose that economic growth leads to a steady state where production and consumption stabilize, resulting in zero growth, which Schumpeter views as a pessimistic perspective [10].

Not all classical economists view economic development negatively. Mill believes that economic development efforts lead to a steady state, which he sees in a positive light [11]. He splits economic issues into production, linked to growth and profits, and distribution, which aims to reduce wealth and income inequalities. Once the economy reaches a steady state, attempts to grow or increase profits become pointless. At this stage, addressing production issues loses relevance, while fair distribution of wealth, along with moral and cultural advancements, remains important.

In classical economics, the steady state reflects limits on growth due to natural resource constraints, supported by the law of diminishing returns [12]. This idea is crucial in degrowth theory, with Daly suggesting a "steady-state economy" as a sustainable development alternative, promoting balance between growth and the environment as resources are utilized and pollutants released. While classical and neoclassical economists use the terms steady state and equilibrium state, they differ significantly. Classical economists believe growth will halt due to resource limits, while neoclassical economics sees growth as tied to technological advancements. Daly initially quoted Mill's steady state concept but later preferred the term equilibrium state, realizing its implications for growth. Few today differentiate between the two terms, and many view equilibrium state as a sustainable development alternative, similar to Daly's perspective [13].

The terms "steady state" and "equilibrium state" are used by classical and neoclassical economists, respectively, and have important differences. Classical economists believe growth will stop due to limited natural resources. In contrast, neoclassical economists think growth will continue based on technological progress. The steady state means no growth due to resource limits, while the equilibrium state allows for growth through innovation. In 1977, Daly mentioned both terms but later preferred "equilibrium state," believing "steady state" seemed too static [14]. Today, few ecological economists differentiate between steady state and equilibrium state; most view equilibrium state as an alternative for sustainable development, like Daly. Daly admitted to Peter Victor that he changed to the equilibrium concept because "steady state" seemed static, later regretting it, as steady state indicates capital and labor grow at the same rate in neoclassical economics [15].

The text discusses the need for research on two concepts related to Mill's steady-state idea. It explores Daly's steady-state economy linked to sustainable development and Jackson's critique of growth advocates, suggesting environmental goals are not met. Georgescu-Roegen argues for negative growth, claiming sustainable development is impossible due to entropy.

Georgescu-Roegen highlights the importance of thermodynamic laws in understanding human economics and nature. These include the law of energy conservation and the significant law of entropy, which explains how materials and energy are transformed irreversibly [16].

Georgescu-Roegen believes that human economic processes are shaped by both natural and social factors. He separates instruments used in economics into two types: endosomatic

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(internal organs) and exosomatic (external tools like labor and production means). Exosomatic tools reflect social relationships and the historical context of economies. While these tools enable human economic growth, they also create a mindset focused on continuous growth, ignoring environmental limits. This growth obsession can worsen environmental issues. Ecological economics, according to him, views human activities as part of biological processes, where resource availability is limited by natural laws. He suggests using solar energy for sustainability to address these challenges effectively [17]. Georgescu-Roegen questions the feasibility of a solar energy economy and critiques balanced growth. Latouche's degrowth theory stems from him, while Jackson's theory follows Daly's steady-state economics, highlighting differing views on sustainable development.

4 DISCUSSION

The degrowth theory, developed by Georgescu-Roegen and Latouche, suggests abandoning infinite growth due to its harmful effects on the environment and humanity. Latouche criticizes the obsession with growth and money, advocating for a shift in values to address the physical, cultural, and social limits of growth.

Two flows of degrowth theories can be identified: one focuses on physical growth limits and the other on cultural and social limits. The former supports degrowth for zero growth and sustainable development, while the latter challenges modern value systems. Daly to Jackson represents the former, and Georgescu-Roegen to Latouche represents the latter.

However, this distinction may not accurately show the differences within degrowth theory itself. Strictly speaking, advocates of degrowth from Georgescu-Roegen's ecological economics do not always deny sustainable development. They reject the sustainable development concept and the equilibrium growth concept of Daly and Malthus but acknowledge the necessity of sustainable development for nations in the Global South. They claim that for wealthy Northern countries, both equilibrium economy and sustainable development do not provide adequate alternatives. Their acceptance of sustainable development for Southern countries likely reflects a desire to find feasible alternatives focused on global justice and ecological economic structures.

Daly and Jackson have notably different views on degrowth and sustainable development. They consider degrowth an alternative primarily for developed nations, while developing, or underdeveloped, countries need sustainable development. Their discussions often revolve around the social limits of growth. Daly criticizes the growth-centric ideology through equilibrium state economics but does not entirely dismiss the need for growth. This has led theorists like Latouche to argue that degrowth theory critiques Daly's equilibrium state economics. F. Hirsch introduced the term "social limits to growth," arguing that capitalist societies harm ecosystems through market competition, leading to unsustainable growth. More extensive critiques of growth-centric ideology can be formulated, although Daly's equilibrium state economics stops at emphasizing the balance between growth and the environment.

Jackson critiques growth-centric ideology similarly and may present a more radical stance than Daly. He argues that capitalism fosters increased consumer demands through profit motives, trapping society in consumerism, which he describes as an "iron cage. " To achieve sustainability, he proposes structural changes to mitigate competition and enhance societal participation, reducing materialistic opportunities for fulfillment. He, like Daly, believes in possible harmony between growth and the environment while acknowledging the need for sustainable development.

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The differences between their approaches to degrowth emerge from how they perceive physical and social limits to growth. The linkage between degrowth and socialism may explain concerns related to social limits. Latouche sees degrowth as a critique of the dominant capitalist value system, defining it as a political project aimed at revitalizing the left by addressing ecological and social contradictions in capitalism. Although Latouche critiques Marxism, he views degrowth as anti-capitalist and anti-modern, suggesting alternatives through Gorz's eco-socialism, advocating job sharing to enhance free time and strengthen social bonds.

In contrast, Jackson avoids linking degrowth to socialism, aiming for prosperity without growth, focusing on enhancing human flourishing while reducing resource input and socio-economic inequalities. He sees a new economy as necessary for prosperity without growth but does not view this as an end to capitalism.

Jackson proposes that an economy should feature jobs that enhance human flourishing and be ecologically sound, with productive activities adhering to three principles: fostering self-fulfillment, providing decent livelihoods, and minimizing material and energy use. He believes socially responsible enterprises embody this "Cinderella economy. " Jackson sees job sharing as essential in a degrowth framework, promoting employment through reduced hours. His emphasis on job sharing differs from Latouche's focus on free time, showcasing alternative views stemming from their theoretical foundations.

Daly's equilibrium economics similarly aligns with findings on fostering diverse societies and cultures within ecological constraints, bridging common ground with Jackson's ideas. Both advocate for equilibrium economies and human flourishing as part of degrowth. The differences between Daly and Jackson vary subtly but encompass their views on economic processes, with Daly recognizing influences from Schumpeter's ideas on qualitative change while Jackson seeks to transition activities from labor-centric to work-centric ones, enhancing self-fulfillment.

Discussions surrounding the intersection of thermodynamic laws and economic frameworks reflect deeper disagreements within degrowth theory. Boulding posits that energy impacts entropy in a closed system, while Daly and Jackson imply that managing material flows limits ecological impact. Georgescu-Roegen, grounded in thermodynamics, critiques stagnation economics and emphasizes the inevitability of entropy in resource flows, leading to divergent views on how growth and development relate to ecology.

In summary, degenerative theories reflect complex ideological frameworks informed by differing interpretations of environmental issues. Recognizing those influences can allow for a clearer understanding of the proposals and critiques presented by figures like Georgescu-Roegen, Daly, and Jackson within ecological economics.

5 CONCLUSION

The discussions on degrowth within the economic sphere chiefly arise within the realm of ecological economics, where there exist two principal divergent streams. From Georgescu-Roegen through Latouche, one stream connects with perceptions leaning towards equilibrium or sustainable forms of growth, whereas the latter, involving Boulding and extending through Daly to Jackson, perceives degrowth as embodying negative growth. The disparities between these locations revolve around whether concepts of stagnant or equilibrium economies can sufficiently secure the sustainability of human society, juxtaposed against the severity of contemporary environmental dilemmas.

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