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Sustainability in Latin America in the Face of Global Warming: In the Context of the Tragedy of the Commons

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Abstract

The objective of this paper is to analyze sustainability as a practice to address global warming in contexts facing the permanent risk of overexploitation of resources known as the *Tragedy of the Commons* (TDC). The methodological design was based on a review of articles, reports and internet portals that address sustainability from the permanent vision of the market, characterized by a rational interest in the exploitation of available natural resources perceived as vulnerable according to the TDC. The results show that a new discourse related to global warming and the challenges it represents for current societies is required. The research limitations reveal insufficient information on experiences of natural resource exploitation through agreements between members, or on successful experiences of sustainable resource management. The findings point to the need for a more regulated society in market practices and, therefore, respect for the self-management of sustainability by market agents as a fundamental working principle for the future of new generations.

Keywords

Latin America, Sustainability, Tragedy of the Commons, Circular Economy, Ostrom, Commons Governance.

1. Introduction

Research with a social focus—aimed at raising awareness in modern societies about the dangers posed by global warming, urban sprawl into natural environments, and the overexploitation of resources (among other regrettable phenomena threatening the survival of current and future generations)—demands the adoption of priority measures to restore normal vital cycles and ensure long-term survival.

In this regard, scientific research—which has produced an extensive body of studies—reflects a persistent concern regarding the measures needed to curb the risks of excessive environmental pollution and its impact on the surroundings; prominent among these measures is the need for proper management of the institutions responsible for natural resource extraction, given the negative impact such activities have on human life.

Evidence gathered in the Latin American context has highlighted the need to articulate foreseeable consequences more clearly. In an environmental landscape threatened by a lack of agreements among the region's governments and exacerbated by deep social inequalities, it is essential to outline—drawing on insights from behavioral economic theory—the expected outcomes for present and future generations.

According to the Garn et al. (2022), in 2017 more than 220 million people needed some type of preventive treatment to combat diseases caused by parasitic worms due to exposure to contaminated water.

In terms of air quality, 90% of the population breathes unhealthy air caused mainly by the effects of industrial activities and the transport sector since the industrial revolution (Garn et al., 2022). On the other hand, the Economic Commission for Latin America and the Caribbean (Escobar, 2002) indicated that globally between 70% and 75% of marine pollution was due to human activities taking place on the earth's surface. Of these, 90% of pollutants are transported by rivers to the sea.

In the same sense, transdisciplinary studies recognize proposals for intervention for sustainability from the market's effort to produce and consume in a sustainable manner and framed within objective 12 of the Sustainable Development Goals (SDG), compatible with the search for economic prosperity materialized in the improvement of the quality of life of the population with the protection of the environment; with SDG 8 compatible with sustainable economic growth and decent work; with SDG 9 based on sustainable industrialization and finally, with SDG 12 focused on sustainable consumption and production.

In this way, the SDGs promote the socio-critical maturity of supply and demand, through economic models such as the Circular Economy (CE), whose principle is the generation of value to waste resources, betting on lower environmental impacts and future reconversion, promoting a virtuous circle of production based on the culture of correct management and reuse of waste (Carrillo González & Pomar Fernández, 2021).

In this sense, institutional agreements in the world have emanated from the world environmental summits, where they have highlighted the need to achieve new global alliances to ensure the survival of future generations. Among them, the "Earth Summit" (United Nations Conference on Environment and Development) stands out, whose proposal was the approval of Agenda 21, in a consensus of the member states on development and environmental cooperation and included topics such as the eradication of poverty and hunger, the fight against climate change, rational consumption of water and energy, and sustainable economic growth (ONU, 1992).

Under this guise, from the perspective of the CE, strategies are proposed that persuade the productive sector and the consumer to materialize the culture of sustainability by promoting practices that reduce the impact of manufacturing and consumption decisions under reuse schemes. In particular, applying these strategies in five of the most important sectors (steel, cement, plastic, food and aluminum) could reduce global emissions derived from the production of key materials by 40%, equivalent to 3.7 billion tons, by 2050 (Ellen MacArthur Foundation, 2019).

However, developing a sustainable entrepreneurship symbolizes the creation and exploitation of opportunities to create future goods and services that sustain the natural and community environment, and in turn, provide development benefits for others (Viteri et al., 2020). A specific reference case is reported by Schröder et al. (2020), who note that in 2019, the Argentine Business Council for Sustainable Development (CEADS) surveyed companies in order to identify how circular practices could contribute to the achievement of Argentina's climate goals and the SDGs. The study showed that 56% of the companies surveyed contributed directly to the reduction of greenhouse gas emissions through the application of circular practices and 70% contributed indirectly. However, since there are no accepted parameters to measure the intensity of resource use associated with production, it is not possible to obtain reliable measurements or make comparisons over a period of time. This highlights the need to propose measurement instruments to monitor current efforts related to sustainability practices.

It is evident that the options on how to produce under a sustainable approach lack meaning and sufficient objective results to demonstrate the SDGs, thus leading to the need to know forms of attention and control of the production system versed in demand and economic competitiveness by sector as a means to persuade the creation of principles to address needs.

A specific case is the plastic recycling systems that should guarantee the participation of the parties involved to achieve a sustainable process, with the objective of reducing the consumption of single-use plastics and betting on new technologies for the development of a circular economy (Ulloa & Virgen, 2022).

Although it is recognized that when the principles of sustainability were known, they emerged as a response that inscribed environmental policies in the adjustments of the neoliberal economy to solve the processes of environmental degradation and the rational use of environmental resources. That is, without a clear perspective to deconstruct the anti-ecological order inherited from economic rationality and to move towards a new social order, guided by the principles of ecological sustainability, participatory democracy and environmental rationality (Leff, 1998).

Referring to the problem of demand or the market, as the main cause of permanent productivity and therefore, of compliance with the SDGs turns out to be a key situation for the development of proposals related to the business structure and management of markets. And in this sense, it becomes a means of compliance for addressing common problems.

The attribution granted to the production system refers to its capacity to manage and develop mechanisms to improve innovation in a disruptive way, seeking continuous development and the promotion of conditions that privilege the right to decent living spaces; the environment and the available resources. In this case, the proposals for achieving sustainable environments seek to create new ways of addressing the challenge posed by global warming and its environmental effects. This means putting emphasis on the reliability of models related to the production and understanding of consumer behavior.

The objective of this paper is to analyze the characteristics of sustainability and its feasibility of application, in the midst of contexts that make the occurrence of TDC evident. It is related to the research question based on recognizing the capacity of sustainability to persuade the context of supply and demand in the face of TDC.

This article is organized as follows: a first section is proposed based on the methodological design of the research; in the second section, a theoretical review of market interventions in sustainability in natural resources is made. Aspects that determine the importance of the perceived problem and the coincidences of the contributions towards a disastrous scenario. Beyond any perception, an analysis is sought that highlights the need for changes in the discourse based on empirical evidence in the context of market production experiences. Finally, conclusions are presented.

2. Methodology

The study adopted a qualitative approach that allowed for the analysis and interpretation of experiences and research contributions regarding sustainability. The objective of the work is to identify how production practices aimed at maximizing capital—through their specific mechanisms of intervention—diverge from principles of nature preservation and, consequently, from the adoption of the models and implementation tools sought by sustainable development.

Based on a review of articles, reports, and documented experiences from March 2 to September 7, 2025, the study describes the characteristics of the discourse on sustainability and its application in corporate strategies, highlighting the topic's relevance and the empirical evidence within the Latin American context. Additionally, surveys and market studies from secondary sources were examined.

To begin the analysis, studies related to the concepts of "environmental protection," "sustainability," and "global warming" were identified (in both English and Spanish, with fewer results found in English texts and a predominance of Spanish-language ones), as well as the various debates these concepts spark within Latin American academia. Relevant cases linked to these search terms were selected, and Scopus databases were used to analyze texts based on the most frequent results. Google Scholar was also employed to search for information on the same topics, acknowledging its lower academic rigor but greater capacity to identify empirical evidence. These search processes enabled a comparison of contrasting concepts: "environmental protection" and "sustainability practices".

This facilitated a comparison of experiences regarding the changes deemed necessary, approached from diverse perspectives. The findings led to a conclusion aimed at persuading stakeholders involved in sustainable resource management to reorient their approach toward sustainability.

3. Results and Discussion

3.1 Literature Review

The perceived state of change in economic systems has constantly responded to the dynamics of the forces of demand and the characteristics of the market that provide consumers with the capacity to generate processes of societal change. A situation that has allowed the development of forms of consumption that frequently undermine the principles of wealth generation in a sustainable manner. And instead, they are versed in the overexploitation of natural resources without the capacity for immediate reconversion.

Elinor Ostrom's research on common-pool resources (CPRs) focused on understanding the sustainable management of resources shared by multiple users, examining the factors that influence decision-making. Her work demonstrates that, under conditions facilitated by the establishment of agreements, users of specific resources can self-organize and develop governance systems—understood as effective institutional arrangements that foster sustainable use. Ostrom's eight principles for the successful management of common-pool resources include: clearly defined boundaries, proportional equivalence between benefits and costs, collective-choice mechanisms, monitoring, sanctions, conflict-resolution mechanisms, recognition of the right to organize, and nested governance structures (Javadi, 2026).

In other words, these principles underscore the importance of local-level cooperation, institutional design, and adaptive governance in addressing the challenges posed by the management of common-pool resources. Ostrom's work contributes significantly to understanding the factors that enable communities and stakeholders to effectively manage shared resources, offering valuable insights for addressing global environmental challenges (Ostrom, 1990, 2012).

Ostrom succeeded in analyzing and constructing local commons (LCs) by drawing on key elements: 1) Public choice theory, which views them as the outcome of processes originating with the individual—who, acting rationally, negotiates in anticipation of tangible benefits. 2) Political ecology, which regards them as part of a "complex human-ecological system" interconnected with the social, political, and economic spheres, while paying particular attention to power relations. 3) The anarchist perspective on the practice of the commons (*commoning*), which validates the role of human relationships in that practice and in the reconstruction of socio-political governance. Thus, the study and design of landed commons (LCs) can be represented through the complexity of physical characteristics (avoiding simplistic dualistic analyses) and political-institutional conditions, in order to identify the driving social dynamics (Moulaert et al., 2024).

So, Elinor Ostrom's concept of polycentric governance describes a governance system characterized by multiple centers of decision-making and authority, involving actors at various levels—from local communities to international organizations—thereby highlighting the importance of cross-scale interactions and collaboration among diverse actors to address complex environmental challenges (Javadi, 2026).

The environmental crisis in Latin America has allowed the creation of a discourse related to socio-technical paradigms that seek to convince of the need for new sustainability policies for the development of environments (Pérez Espinosa, 2022); thus guaranteeing social equity and a new attempt to develop a free market system that obeys new ways of producing and consuming. However, the main exercise of maturity related to the need to propose new forms of production is related to the instruments used as mechanisms of persuasion and paradigm change in the market. Recognizing the need for new patterns of consumption implies a strategic and business exercise related to the ability to generate awareness, to achieve new forms of understanding between producers and consumers.

In this case, one of the means of execution for a new strategy versed in ways of understanding strategies, is related to the composition of the market and consumers. And it can be conceived as the need for a new reflection on consumption based on the risks for the future, conceiving the tragic scenario of insufficiency to survive.

3.2 Generalities of Sustainability as a Response to Environmental Challenges

Recognizing the importance of sustainability as a solution mechanism to environmental problems can be a trivial exercise in the midst of the risks that we perceive for the environment of productive systems equivalent to the offer; seen as a priority need in the midst of attention to needs.

The concept of sustainability has been raised from a logic on production systems where some responses such as recycling waste converts them into by-products from industrial and intensive production processes and thus, guarantee profitable systems with the least impact on the natural development of the environments.

In this sense, the dynamics of industrial ecology made its contribution to product systems implicit from the reuse of waste considered new sources of inputs. This means an improvement in intensive production systems through cost reduction, improved price levels and, with it, the emergence of new products based on innovation in the change of markets sustained by permanent innovation and the perceived need for change in the consumer.

Sustainability has sought a greater scope of understanding of the challenges planned by consumption and manufacturing systems. From the mechanisms of intervention in the economy or in market systems, the ways of influencing the way the consumer thinks and acts are disrupted by means of a new market reality. From principles related to the way in which consumption supports production systems and waste recycling.

Given this scenario, the exercise of consumption has maintained excessive pressure on the capacity for regeneration of natural resources. And the debate of a new neo-institutional economic approach attached to the regulation of productive supply, consumption and distribution has begun, necessary for the survival of the present and future generation. In the case of Mexico and other countries such as Brazil, Colombia and Paraguay, limited economic growth has contributed to modifying citizen perspectives that supported the rise of populist parties to power that, in the name of the discourse for greater economic growth, undermined important achievements in terms of institutional responsibility, peace, social protection and equality, and relaxed environmental protection policies, exposing new obstacles to compliance with the SDGs in their social, environmental and economic dimensions and with it, their rise to an inclusive circular economy (Lobos Alva & Rueff, 2019).

3.3 The Concept of Sustainability

Attributed to the concept promoted by the Sustainable Development Goals (SDG), sustainability has been defined as a current of public action that highlights the need to make the principles of economic rationality compatible with the restorative or regenerative environmental commitment by intention, upsetting the interest of the market for a reflective one. In this way, the flows of technical and biological materials are interrelated with economic processes, underlining the need to prioritize the use of created energy as a factor of wear and tear and future recovery of ecosystems.

By 2024, new contributions had highlighted that sustainability works by strengthening the awareness of the productive sectors in order to demonstrate the capacity to reconvert the flow of waste in the life cycle of products. A recent economic perspective on sustainability considers that production systems are sustained by the flow of materials, the support of production systems versed in reverse logistics, registration systems and adaptation of companies and monitoring of policies that contribute directly to a new governance of sustainability from the institutional level.

Thus, from the production systems, the importance of sustainability starts from the recognition of the scarcity of raw materials and inputs, reaching the need to persuade a new option of reuse that optimizes the level of extraction of resources.

However, the difficulties to achieve this are evident from some isolated attempts at procurement. Specifically, the Latin American context maintains as a current concern the sustainability of management processes from placement systems for reuse and reincorporation into the production loop and characteristic of the CE. Despite the efficiency supported in other studies, it seems to live with a management and support mechanism that is achieved through the participation of those involved, especially from the public agenda, instrumental political lies converted into programs and actions in particular.

Thus, a new circular approach to sustainability is necessary in the midst of a turbulent system that shows the effects of global warming and the new environmental risks posed by excessive pollution. In the Latin American context, this situation is evident in the midst of a lack of consumer interest in changing their consumption patterns, represented by competitive production systems and demand for products with low prices given the socioeconomic characteristics of the population.

However, the need to attract the consumer to a new way of consuming has implications in a system attracted by low costs where the product management strategy requires new reflections together with the updating of institutionalized frameworks.

3.4 The TDC in Sustainability in the Face of Climate Change

The global and local problems of today's world require a profound reformulation of approaches to planning and public management, in which the notions of adaptation, innovation, resilience, and learning must permeate more strongly some trends already observable in what could be called the relational or deliberative turn of public management (Tarragón & Brugué-Torruella, 2015).

However, the Latin American region continues to form a sustained system that involves key factors for the exercise of social environments as a whole. In such a case, collaboration is neither spontaneous nor imposed; it requires rebuilding trust between citizens and between citizens and democratic institutions, as well as generating deliberate policies and practices that facilitate it, to create a collaborative culture (Morales et al., 2021).

The TDC has been perceived by the results obtained, at a level of precariousness for the improvement of exploitation systems where a new idea of concentration of efforts proposes changes and materializes them, thus opening the opportunity to improve product systems. For E. Ostrom, the relevance of studying and demonstrating with empirical studies the existence of different forms of self-organization capable of managing common-use resources is not based on denying the validity of the theories that formulate the tragedy of the commons from individual rational actions, but on questioning their capacity for generalization, that is, their universal character.

In this sense, an antagonistic character to capital is not recognized; common goods can coexist with public goods and privately owned goods (Ostrom, 2000). However, their vocation differs in the face of possible exploitation freedoms. This is the case of private property, where the maximum capacities of limited rationality—characterized by insufficient information—create their own forms of exploitation; while public property must be constantly regulated, often dominated by an incomplete civic virtue, unequal culture and dominated by greed or a permanent expectation of performance despite harming the environment.

From this perspective, the common is the political principle that defends the right of public/private non-appropriability through social practices and ways of life based on self-government. The co-obligation of men and women engaged in an

activity in the public space enables alternative practices to those based on the principle of competition and the dynamics of privatization of all spheres of life. In this way, it is proposed to understand the common as a new reason, a political principle with a sense of counter-hegemonic convergence to neoliberal rationality and its logics of accumulation, privatization and enclosure (Rieiro & Bustos, 2022). Societal development poses new challenges that require reconfiguring as a way of meeting the demands for the preservation of human life that, in the midst of market activities, achieve significance in the midst of the search for attention to the needs of both the population and the preservation of natural resources, the reference of the problem being global warming or rising temperatures, which, according to Lara (2021), can cause the extinction of several species; glaciers to melt; sea levels to rise; changes in weather patterns and forests to dry. Meanwhile, fauna and flora disappear; cyclones, hurricanes, storms, torrential rains; as well as water and air pollution that affect the soil (Gutiérrez, 2001, pp. 11–12).

The causes attributed to global warming begin from the consideration of natural factors and the use of fossil fuels; productive activities; human consumption and solid waste; deforestation and construction of large cities; globalization; lack of awareness and economic interests of governments unrelated to the concern for respect and care of the environment (Lara, 2021). This requires paradigm shifts in the forms of government; in market and business models that disrupt the mentality of consumers by distinguishing sustainability with a plural improvement mechanism that makes production systems sources of environmental respect.

In this way, changes in the living environment generate risks for human security, such as destabilization in populations that depend on water resources, reducing areas for crops (as is the case in Guatemala), with complex and serious economic and social consequences due to increasing desertification. Meanwhile, among the main effects are the worsening of multidimensional poverty, famine and climate migration (Pérez Espinosa, 2022).

Given the above and faced with the tendency of individual rationality that threatens the rights of all by the hegemonic decision of some interests, in recent decades, the defense of the commons and community practices have been strengthened again, presenting themselves as an experimental category (Fernández Álvarez et al., 2021). And at the same time, they regain the necessary strength to be accredited as historical struggles and the possibility of creating new ethical-political modes (Spinoza, 1986, 2000, 2021). However, the persistence of a lax way of treating each other to become references for sustainable regional construction.

In such a situation, the experiences in regions of Latin America—in recognition of the threatening tragedy against common rights—can be perceived in differentiated environments dominated by artificial borders between the community, the federative and the national. An example of this is the environmental conflicts that arise from the ecological distribution and socio-environmental settings that overexploit resources such as water by real estate companies, as well as by industries and forestry companies, ultimately causing serious damage to the biodiversity of the wetland, demonstrated mainly by its decrease in surface area (Castillo et al., 2020).

According to Rovira et al. (2017), in the report "Climate action in agriculture: the experience of member countries of the Climate Action Platform in Agriculture in Latin America and the Caribbean" published by ECLAC (2023), in countries of the region there are advisory councils that seek to strengthen public-private dialogue and cooperation between the government, productive sectors, consumers, academia and civil society organizations to strengthen and promote the adoption of sustainable production and consumption, in the face of the uncertainty posed by global warming. In Argentina, the Advisory Council on Sustainable Production and Consumption; in Chile, the National Council on Cleaner Production; in Costa Rica, the National Intersectoral Committee on Clean Production; in El Salvador, the National Intersectoral Committee on Cleaner Production; in Mexico, the Advisory Council on Sustainable Production and Consumption and in Nicaragua, the National Intersectoral Committee on Cleaner Production. In the case of Mexico, the Federal Attorney for Environmental Protection (PROFEPA) established the National Environmental Audit Program (PNAA) in 1992 under the name of Clean Industry. However, the high costs and difficulties involved in incorporating the use of green technologies in production processes, and especially in SMEs in conditions of unequal capacity to respond to processes dominated by entities with greater capacity, are a challenge.

In this case, the *KPMG Report on Sustainability in Mexico* (2018) highlights that sustainability is a paradigm of eco-innovation that involves unequal management capacities, derived from unequal competition between companies; their levels of investment and technical development, which permeate suppliers and manufacturers in other steps of the value chain (KPMG México, 2018).

A particular situation was the *Waste Management Outlook Report for Latin America and the Caribbean* (UNEP, 2018) which projected that at least 20% of all PET bottles collected are not managed correctly. While the proper final disposal of waste has improved significantly over the last decade, this will continue to be a challenge as the amount of waste generated increases from 541,000 tons per day in 2014 to the 671,000 tons per day projected for 2050. In other words, the statistics demonstrate insufficient efforts towards sustainable systems and their medium-term prospects. In another

sense, while in the world several of the technologies necessary for the transition to a low-carbon economy require a range of base and precious metals, including copper, lithium, gold, uranium, rare earths, silver and zinc, to meet the demand for energy storage technologies, global production of graphite, lithium and cobalt will need to increase by more than 450% by 2050 compared to 2018 levels (Hund et al., 2020).

According to the SINTEF (2020) report *Urban Mining*, given the widespread use of electronic technologies and devices, energy consumption exceeds the amounts that can be obtained through recycling and urban mining (a process that consists of recovering raw materials from used products, buildings and waste). That is, for market forces, the supply continues under the precedent of fossil energy sources far from sustainability. Thus, the dynamics of unsustainable production and supply are persuaded by the objectives of regional competitiveness based on principles such as planned obsolescence and maximizing investment returns.

3.5 Analysis and Discussion

Recognizing the importance of a more sustainable environment is necessary in the midst of the challenges represented by the application of sustainability practices and environmental challenges. New sensitivities to the creation of a new social awareness are given, but they require a certain level of social reinforcement and persuasion of development exercises.

The constant evolution of the market converted into management of new consumer segments is related to the competitive capacity to generate better price levels. Meanwhile, new business models present isolated alternatives for configuring logistics chains. Meanwhile, sustainability is relegated to an option of replacement between products with price differentiation frequently derived from specialized production systems with incorporated value and converted into higher prices.

The article "Forum Shares Experiences to Surmount LAC's Lag in Fulfilling 2030 Agenda," published by the International Institute for Sustainable Development (IISD) SDG Knowledge Hub, highlighted key outcomes from the Eighth Forum of the Countries of Latin America and the Caribbean. It underscored the lack of sufficient funding to address the region's national challenges and the need to strengthen cooperation to achieve the Sustainable Development Goals. Key recommendations included the need to expand institutional capacities to manage economic, social, and environmental transformations through the participation of governments, international bodies, and other sectors—thereby turning global commitments into concrete actions and, essentially, moving toward proactive governance of environmental challenges grounded in the need to protect the environment (International Institute for Sustainable Development [IISD], 2025).

However, referring to practical governance processes entails recognizing the mechanisms within government structures that foster market development alongside equity; it is in this realm that the Latin American region faces its most significant challenges: social inequality stemming from ineffective institutional frameworks.

In this way, the consumer market faces new visions and expectations created by its capacity for intergenerational reflection. Business structures are based on a new way of understanding the world from what lifestyles and consumer needs represent, the need for a way of understanding and comprehending the situation that holds environmental challenges implies considering a new citizen awareness related to the expectations of what the world expects and what it would look for in the medium and long term.

Consequently, the theory of reflexive society should be integrated into the socioeconomic context; market strategies based on consumer behavior should reach new dimensions of understanding, more closely linked to customer expectations.

A perspective held until now on the consumption of products under a sustainable nature may still be insufficient; a new tone of discourse and persuasion is required capable of converting the message into a lesson about the risks of the future.

Sustaining the expectations of improvement of consumption practices among intergenerational groups is only part of the achievement. While a social base foreign to the understanding of generational groups continues not to be maintained as evidence of the project.

While on the product systems side, the achievement of benefits expected from sustainability is maintained when the business context directly benefits from it and makes evident in its production methods the expected direct economic benefits.

4. Conclusions

A new economic reality for the Latin American region based on sustainability and its precepts is necessary in the midst of the perceived results of global warming. The role of business structures remains competitive from the rational application of the agents and the effects that these decisions entail in the midst of regions immersed in poverty and inequality.

The favorable context for the generation of sustainability can be based on policy principles that are achieved with a new governance for the region. The forms of production with empirical evidence today refer to a society with signs of interest regarding the presence of instruments and mechanisms of participation and business. However, the fact of the new forms of production at a global level shows that it is necessary to involve systems that are the product of sustainable management and innovation, represented by the approaches of the CE and the reuse of inputs from industrialization schemes promoted by local governments, that is, from the need for a new governance for sustainability.

Therefore, sustainability is a paradigm that shows the beginning of the transformation of a new production system, necessary to create new market conditions applied to living environments and seeking to guarantee the permanence of present generations and the survival of future generations in the face of climate change that is likely to promote global warming. In this sense, the importance of TDC contributes to predicting that it is the responsibility of market agents to self-organize and manage common-use resources and not only of the production system or the state, but of anyone involved in dealing with the materialization of tragic results.

Therefore, sustainability represents a paradigm marking the beginning of a transformation toward a new production system—one necessary to create market conditions aligned with our living environments and designed to ensure the well-being of current generations and the survival of future ones in the face of climate change likely to drive global warming. In this context, the relevance of the "Tragedy of the Commons" suggests that the responsibility for self-organization and the management of common-pool resources does not rest solely with the production system or the State, but with any actor involved in addressing the risk of catastrophic outcomes. Consequently, it is advisable to promote public management practices that recognize social norms aimed at reducing inequality, acting as an antidote to the lack of environmental protection, overexploitation, and disastrous environmental consequences:

1) Create a Latin American council for the evaluation of public instruments and outcomes. From a social perspective, this body would help define public actions that directly protect the environment by improving the conditions of populations living in extreme precariousness, thereby serving as an environmental safeguard mechanism.

2) Foster environmental transparency through collaboration among government, the business sector, civil society, and academia; this acts as a governance mechanism to drive the improvement, stability, and long-term preservation of natural resources.

3) Audit compliance with environmental protection practices—leveraging citizen participation—as a means to improve social conditions.

Declarations

Author Contributions

Oscar Gonzalez Munoz: Conceptualization, Methodology, Investigation, Writing – Original Draft, Writing – Review & Editing. Verónica Alejandra González Muñoz, Ph.D: Methodology, Writing – Review & Editing.

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Use of AI and AI-Assisted Technologies

Author to disclose any AI/LLM tools used (name, version, purpose), or state that none were used.

Data Availability Statement

Author to confirm, "No new data were generated; all sources analysed are cited in the reference list."

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