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The Role of Environmental Bonds in the Settlement of Environmental Debts

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Abstract

The concept of environmental debt, which has several dimensions, emerged in the nineties. One of these dimensions is spatial, referring to the debts that southern countries sustain due to the extraction of natural resources and environmental damage inflicted upon northern countries. Another dimension, the temporal dimension, concerns the environmental debts that current generations owe to their predecessors. That means past generations are culpable for overuse of natural resources and mismanagement. The debt issue is complex, despite many mechanisms to resolve it. Most important are the recently introduced environmental bonds, an important step forward in the field of sustainable financing of environmental debts.

Keywords: Environmental Debt, Green Bonds, Blue Bonds, Climate Bonds, Environmental Justice

Introduction

Life on Earth depends on the environment—one of man's most valuable assets. However, economic and social development also involves the use of natural resources and activities that harm the environment (Stern, 2019). In response, environmental debt was created, which concerned the environmental liabilities of states and possible negative outcomes of their economic and developmental activities (Martinez-Alier & Walter, 2016). The concept isn't without challenges—determining liability, environmental damage assessment, and repayment mechanisms for these debts—but it does promote environmental sustainability and the use of natural resources. Some international financial institutions have started adopting environmental and social standards for loans and financing and issuing environmental bonds to finance environmental projects and the sustainability of natural resources. But environmental debt rises more than financial questions; it poses ethical, moral and political questions about the current global order (World Bank, 2023).

The idea of environmental debt developed from its late 20th-century roots in response to increased awareness of climate change and ecological degradation. Its premise is that intergenerational responsibilities and global equity go beyond financial obligations. The developed nations, which historically contributed more to environmental degradation through industrialization, are disproportionately

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liable for carrying these accumulated environmental liabilities. Questions about justice, fairness, and how environmental burdens are shared across regions and generations follow this (O'Neill, 2019).

Also, environmental debt quantification poses methodological questions. The environmental damage measured in traditional economic metrics might miss biodiversity loss, ecosystem degradation and health impacts on communities (Costanza et al., 2014). Attempting to override such limits has been done in environmental economics through ecosystem services accounting and social cost of carbon calculations. Such approaches are nevertheless controversial and largely uncontested in available literature and policy documents (Zhang & Wang, 2021).

Incorporating environmental debt into global development frameworks introduced new financial and governance strategies. The use of carbon credits and green Bonds, along with debt-for-nature swaps aims to take advantage of environmental obligations and offer market-based solutions to environmental problems (Climate bonds Initiative, 2023). Nevertheless, these processes are often criticized for changing the sources of environmental degradation instead of addressing them. The impact of market-based strategies on achieving true environmental sustainability is still a topic of ongoing research in academia (Nordhaus, 2017).

Global governance and international relations play a role in tackling environmental liabilities (UNEP, 2022). Traditional ideas about sovereignty and national interest emphasize the interconnectedness of environmental systems and the need for united global efforts. In order to make these commitments official, the Paris Agreement along with other global environmental agreements is created for this purpose. Nevertheless, their methods of enforcement may not always be sufficient to guarantee adherence. It prompts questions about how effective current international legal systems are in dealing with environmental issues (Richardson, 2019).

Additionally, the introduction of new technology to tackle environmental debt adds complexity to this discussion. Although technical solutions are able to help lessen environmental harm and repair ecosystems, they also bring up concerns about who can access these technologies and establish new relationships of reliance between more advanced nations and those still developing. There has been little advancement in international discussions on environmental matters (Henderson, 2020).

Literature Review

Conceptual Evolution and Theoretical Framework

The concept of environmental debt was brought to light as a result of growing concerns about environmental damage and the excessive use of resources, spurred on by grassroots environmental movements in Latin America in the late 1980s (Martinez Alier, 2002). The structure, originally seen as a responsibility for developing countries to protect the environment, has consequences for worldwide environmental management and fairness between generations. Countries, institutions, and societies have responsibilities towards the environment and generations to come as a result of exploiting resources and leading to harm to the environment, as described by the idea of environmental debt (Warlenius et al., 2015).

Ecological economics has shaped theories about environmental debt. The environmental debt framework disrupts conventional economic models by taking into account social and ecological expenses that are usually overlooked in standard accounting practices (Rice, 2009). Gonzalez-Martinez and Schandl (2008) examine the historical buildup of environmental liabilities brought on by resource exploitation and pollution, focusing on how these impacts have been particularly severe on developing countries.

Policy Framework and Global Governance

As environmental debt became more accepted worldwide, environmental policy has also developed (Bodansky, 2016). The Paris Agreement extended this framework with specific national commitments and responsibilities. Zhang and Wang (2021) examined the development of international climate finance mechanisms and its relation to environmental debt. They scrutinize the implementation of environmental commitments, specifically the financial transfers from developed to developing countries. Henderson (2020) confirmed these results by finding structural barriers to environmental debt resolution within existing international frameworks.

Financial Mechanisms and Market Solutions

Environmental debt has sparked a variety of financial responses. The interest in green bonds as a way to finance environmental projects has led to a substantial increase in their issuance globally, reaching record levels (Climate Bonds Initiative, 2023). Cassimon et al. (2011) investigated the debt relief connection to environmental conservation objectives using debt-for-nature swaps. The study noted that utilizing market-based solutions to address environmental debt comes with both benefits and drawbacks. Another possibility would be trading mechanisms for environmental debt. Richardson (2019) investigated carbon offset initiatives and trading tactics. These measures offer financial rewards for protecting the environment while also allowing flexibility in meeting environmental obligations.

Technological Innovation and Environmental Solutions

Innovation in technology has the potential to reduce environmental debt, but there are significant equity concerns that must be considered before its deployment. Two important technological avenues for lessening human influence on the environment are renewable energy and sustainable agriculture. The developing nations' reliance and access to environmental technology raise challenging considerations (Ahmadi and Thompson, 2022). Beyond the realm of economics, the environmental debt affects society and culture. O'Neill (2019) investigated that the indigenous communities' different cultural views of environmental debt impact their perceptions of the issue and their reactions to it. He noted that traditional ecological knowledge and cultural diversity should be factors in environmental debt frameworks. More and more studies nowadays are incorporating sustainability frameworks that take environmental debt into account. The intertwining of sustainable development goals and environmental debt necessitates interdisciplinary solutions (Davidson et al., 2023).

Research methodology

Research on the environmental debt settlement issue and the role of environmental bonds in this settlement requires a descriptive and analytical approach. This includes defining environmental debt and its role in sustainable development and environmental justice and explaining environmental bonds and their role in settling environmental debt.

Discussion

The history of the emergence of environmental debt

Virgilio Barco Vargas, the president of Colombia, first used the phrase "environmental debt" in 1989 during a speech at the UN General Assembly. He believes that industrial production has brought on pollution, acid rain and erosion in less than two hundred years. The Ozone Layer symbolizes an environmental obligation that developed nations owe to generations to come due to their reckless consumption of natural resources (UN General Assembly, 1989). The two organizations brought up the topic in a separate treaty during the Earth Summit in Rio de Janeiro in 1992, leading to talks about an environmental obligation from developed countries to developing countries in the future. The concept of environmental debt originated from the efforts of grassroots movements in the southern regions and transitioned from labor unions to academia (I'aki et al., 2010). The Environmental Action Organization spearheaded efforts to eradicate international debt in the years following the 1992 Earth Summit. They collaborated with other movements including the Jubilee movement, to increase awareness about the issue. Together with other movements such as the Jubilee movement, the South demanded the repayment of illegal financial debts (Warlenius, 2018). In 1997, Cuba spoke at the UN General Assembly and argued that wealthy nations, who have benefited from exploiting developing countries, should be responsible for addressing their environmental debts, which are the main reason for environmental destruction. At present, many NGOs have turned their attention to environmental debt. The coalition of environmental debt holders from Southern nations, which includes NGOs from these countries, collaborates with the European network to promote the recognition of environmental debt through European NGOs (Paredis et al., 2004).

Definition of Environmental Debt

This concept of environmental debt refers to the environmental connections between more advanced and less advanced industrialized nations and their impact on the environment. The concept of environmental debt is not officially defined, but it typically refers to the accountability of developed countries and their counterparts in developing nations for enabling harmful production and consumption practices that harm the environment. The removal of natural resources such as oil and minerals, which are then sold at discounted rates without considering the negative effects on the environment and society, is another factor that adds to environmental liabilities. The act of utilizing traditional knowledge from Indigenous communities in biotechnology is often labeled as environmental religion by Nordic countries and multinational corporations (Goeminne, 2008).

Internationally, ecological debt is not defined by any formal convention. The debt agreement of 1992 highlighted a worldwide environmental debt owed to developing countries. The Debt Treaty of 1992 states that the North's trade and economic connections are dependent on the widespread exploitation of natural resources and environmental harm, which is seen as the main factor contributing to the debt issue. The UN Environment Program defined environmental debt in 2001 as the accumulation of harm from resource extraction by wealthy nations without fair compensation, including the theft of human, animal, and plant genetic material (also known as "biopiracy"). Humanity owes the biosphere a substantial amount of money due to the considerable and, at times, irreparable damage that humans have caused it (Ibtihal, 2014).

Environmental debt derives its legal basis from a number of concepts enshrined in international environmental law, the most important of which is the polluter pays principle. According to this idea, whoever is at fault for pollution should pay for the measures the government takes to control it. As part of this principle, those whose actions harm the environment must either pay for all of the expenses incurred as a result of the damage or take measures to ensure that it does not exceed certain limits. This idea has been defined as a prerequisite for correcting environmental damage and making the polluter financially liable in numerous international accords, such as the European Union Convention of 1992 (Hadeel & Hadi, 2013).

The Helsinki Convention of 1992, which regulates the preservation of the marine environment in the Baltic Sea area, also includes this principle. All parties involved must abide by the key principles that govern environmental debt, which are the principle of the polluter paying for their actions and the principle of shared but different responsibilities (Fitzmaurice, 2006). This principle guarantees that states are held responsible for their actions. This goes against the core principle of international law, which calls for all states are treated equally and without bias

(Dechezleprêtre & Sato, 2017). This is one way that the North and South are recognized as being unequal.

The first party is dedicated to offering financial and technical support to the second party to help improve its capacity to fulfill its global environmental responsibilities (Mohammed, 2013). Among the most crucial international documents that mention the seventh principle of the Rio Declaration from 1992 is the Rio Declaration itself. The principle of equitable benefit sharing is the final principle that guides environmental debt, and it focuses on fairly distributing the benefits that come from utilizing biological and genetic resources, as outlined in international environmental law. The principle involves gaining technical skills and knowledge, encouraging the growth of local economies and livelihoods, and enhancing local institutions (Burnell, 2017). One of the key agreements that allowed for this was the 1992 Convention on Biological Diversity, specifically in Article I. In 2004, the Secretariat of the Convention on Biological Diversity similarly supported the Bonn Guidelines on Access to Genetic Resources and the Fair and Equitable Sharing arising from their utilization (Munson, 2019). The purpose of the Bonn Guidelines is to provide parties direction on how to establish a system for accessing resources and distributing the benefits that come from them (Buck & Hamilton, 2011).

The role of environmental debt in achieving sustainable development and environmental justice

The concept of environmental debt underscores the environmental conflicts among communities and the interplay between individuals, natural resources and society (Joan, 2014). Grotius (2005) argues that the right stems from the "need to take care of social life". Promoting environmental awareness and fostering environmental responsibility are crucial to realizing the principles and objectives of sustainable development and environmental justice.

The role of environmental debt in achieving environmental justice

In the United States, people of color in the brown movement started to observe that blacks, Latinos, and Native Americans were deliberately residing in neighborhoods with the highest levels of pollution and environmental harm. As a result, environmental justice was described as a collection of principles and beliefs (Clifford et al., 2009). It was stated that environmental justice involves promoting sustainable communities and fostering individual engagement to establish a secure and healthy environment through cultural practices, decisions, and policies (Huang, 2017). The United States Environmental Protection Agency's Office of Environmental Justice defines environmental justice as the equitable and inclusive involvement of all individuals, regardless of their color, race, income, or national origin, in the creation, execution, and enforcement of environmental laws, regulations, and policies. According to the United Nations Development Program (UNDP, 2014), environmental justice refers to legal changes aimed at reducing power abuses that leave the vulnerable and poor disproportionately impacted by pollution and lack of equal access to and use of natural resources. The term environmental justice is usually linked to climate justice. We can define environmental justice as the fair distribution of the impacts of using natural resources and ecosystem services, while also viewing climate change as a moral and political concern (Schlosberg, 2007).

Environmental justice is essential in bringing attention to the imbalance between developing and developed nations, as the overconsumption of natural resources by wealthier countries has led to various environmental problems, including environmental debt. Less developed countries, while making a smaller contribution to global environmental damage, suffer the most from limited resources and insufficient government systems (Carmen, 2015). Additionally, there are procedural disparities between developing and developed nations. Rich nations have a significant amount of economic and political power, allowing them to dominate the decision-making processes of organizations like the IMF, World Bank, and WTO. While developing countries may have varying viewpoints, the primary outcomes of these organizations are ultimately shaped by the preferences of powerful nations (Rajan & Harper, 2004). In contrast, the North's dominance over a significant portion of global resources since the colonial period has contributed to its industrial growth. This allowed it to sustain levels of consumption that greatly surpassed what its natural resources could support. According to British historian Clive Ponting, the people of the third world suffered greatly regarding human suffering, poverty, and exploitation to be able to achieve this progress. The current global system has resulted in significant environmental disparities, with a small percentage of the population residing in OECD nations consuming most of the world's resources. They are, therefore, responsible for about 80% of all environmental damage. Because of this unequal historical situation, a small group of wealthy consumers are now environmentally indebted to most people around the world. This is true even in countries that are faced with financial struggles, where global financial institutions will be the primary creditors. The practice of using wealthy nations as a repository for financial liabilities has increased. Western countries have enforced stringent environmental laws, leading to the expansion of industries that pollute and the dumping of hazardous waste in developing nations (Abbas, 2020). In Guinea-Bissau, a country in Africa that is known for its poverty, the government made the decision in 1988 to allow the import of over 15 million metric tons of hazardous waste from European tanneries and pharmaceutical companies. This deal was worth 600 million US dollars, which was 4 times the country's GDP at the time. While this agreement may appear to be financially advantageous in the immediate future, particularly for nations facing budgetary challenges, it failed to prioritize the rights of individuals. This is why we must consider the impact of environmental debt when striving for environmental fairness. This point is illustrated by using these debts to allocate funding and resources to impoverished and disadvantaged communities that are experiencing adverse environmental effects (Joan, 2012). Using these debts to secure resources and support for disadvantaged communities affected by broader environmental problems highlights the significance of environmental debt in promoting environmental equity. As a result, this helps to bridge the environmental divide among communities and fosters a harmonious relationship between people and their surroundings.

The role of environmental debt in achieving sustainable development

The idea of sustainable Development received considerable international attention, particularly after the Rio de Janeiro Earth Summit in 1992, a United Nations conference on the Environment and Development (Hassan and Hussam, 2021). The United Nations' Brundtland report introduced the idea of sustainable development to the global audience for the first time. The concept aims to attain progress that satisfies the present generation's needs while also ensuring that future generations can fulfill their own needs and demands, as stated in the Brundtland report from 1987. Sustainable development is referred to as the responsibility of passing down a harmonious balance of natural resources and ecosystem benefits from one generation to the next. If not, progress cannot be maintained, leading to each new generation using up the resources of the one before it (Christoforidis et al., 2019).

The UN General Assembly approved the 2030 Agenda for Sustainable Development in September 2015, which is composed of 17 Sustainable Development Goals. These objectives represent a holistic plan for a more environmentally friendly future, based on the harmony of social, economic, and environmental facets of society (Kanie & Biermann, 2017). Nevertheless, achieving these goals has been challenging, especially considering the impacts of neo-environmental colonialism. Researchers warn that the successful attainment of the Sustainable Development Goals could be jeopardized if resources and responsibilities are not distributed equitably. These, therefore, goals include both developed countries and developing countries (Jeffrey, 2012). Global collaboration is needed to tackle the environmental deficit through financial and technical exchanges in order to promote sustainable development. The cost that developed countries must bear in order for developing countries to engage in sustainable development appears to be these transfers (Lavallee, 2010). The 1994 Desertification Convention introduces the concept of funding from governments and offers support to affected developing countries in carrying out the Convention. This sets forth a set of responsibilities for developed nations to help support developing countries. The United Nations Framework Convention on Climate Change operates on the same principle that developed countries must take the lead in addressing and combating the negative effects of climate change (UNFCCC, 1992). The Kyoto Protocol and the United Nations Framework Convention on Climate Change, along with their annexes, did not require developing countries to decrease their emissions. Yet, these nations received benefits from Clean Development Mechanisms, which permitted developed countries to set up industrial projects within their borders. Today, it is crucial for developing nations to create and implement national adaptation plans that will allow their economies to facilitate sustainable practices (Bartenstein, 2010). The ecological religion promotes a common set of beliefs that prioritize acknowledging the rights of local communities and nature, as well as a dedication to sustainable development. All developing nations, regardless of their stage of development and cultural and social backgrounds are required to meet this obligation (Zeineddine, 2022).

Environmental bonds as a mechanism for settling environmental debts

There are many environmental financing instruments that lead to the repayment of environmental debts, and environmental bonds are one of the most prominent financial innovations in the field of sustainable finance. Since the World Bank issued the first green bond in 2008, the global market for environmental bonds has grown from USD 20 billion issued in 2013 to more than USD 250 billion issued in 2019 (Tuhkanen & Vulturius, 2022). Environmental bonds are financial instruments issued by companies or governments to finance projects and initiatives aimed at protecting the environment and promoting sustainable development, such as renewable energy projects, improving resource efficiency, and waste management.

Therefore, private or public organizations can issue this type of bond, just like traditional bonds, to finance investments that yield environmental benefits. Such organizations provide a loan to the borrower investor, who then repays these loans and the interest due within an agreed period, making it a fixed-income instrument.

However, it's important to note that environmental bonds, unlike traditional ones, come in a variety of forms and can serve as a mechanism for settling environmental debts. Green bonds, the most significant type, are obligations that finance or refinance investments, projects, expenses, or assets that tackle environmental issues. Governments and companies utilize these bonds to fund the shift towards a more sustainable and low-carbon economy (Stefano, 2022).

The International Association of Capital Markets defines these bonds as "a type of bond whose proceeds are used—exclusively—to finance or refinance, partially or completely, eligible green projects" (Berensmann et al., 2018). Therefore, these bonds act as a way for developed countries to fulfill their commitments related to reducing greenhouse gas emissions by establishing eligible projects in developing countries.

The Sustainable Development Goals align with the projects financed by these bonds, and despite the relatively nascent nature of these bond markets, their rapid issuance has established them as a viable environmental financing tool for environmental debt repayment (Sahu et al., 2019). They were valuable tools within the initiatives of international finance institutions related to climate change and sustainable development finance (World Bank, 2012).

Blue bonds are a specific category of bonds involving businesses, governments, financial institutions, and municipalities using yields and bonds tied to Key Performance Indicators for ocean-related assets and projects to support the Sustainable Development Goals. The official website of the World Bank describes blue bonds as a type of debt instrument that other organizations, development banks, or governments use to entice funding from significant investors for projects focusing on marine and ocean conservation with favorable environmental, economic, and climate impacts. This description is derived from the concept of the blue economy, which entails the environmentally friendly utilization of oceanic resources (Bosmans & Mariz, 2023). According to the UN Global Compact, this kind of bond must have a specific objective relating to water sustainability, and the investment or project must directly improve the marine environment, such as aquaculture, fisheries, and wastewater treatment.

In 2018, blue bonds gained recognition when the Seychelles introduced a 10-year bond with backing from the Global Environment Facility and the World Bank Group. The bond was designed to help improve marine protected areas by 30 % and enhance fisheries management and the blue economy within the country. Developing countries, especially those with island economies, have faced challenges in obtaining climate finance. One example is the Caribbean region, which finds it challenging to obtain adequate local funding, whether from public or private sources, to access international aid due to its tiny size, limited resources, and isolated location. The islands are facing the brunt of climate change effects and need funding to make the required investments to address and adapt to these changes. Blue bonds could be a helpful way to finance these efforts and address the environmental damage, especially considering the responsibility of developed nations for the harm caused to island states' marine environments (FAO, 2020).

Climate bonds, which are defined as fixed-income securities issued to obtain financing for projects and the development of a low-carbon economy resistant to climate change, are the final type of bonds that can play a significant role in the repayment of environmental debt. They can also be defined as bonds with specific themes, backed by assets specifically issued to finance measures for climate change mitigation and adaptation. These bonds are designed to suit the requirements of the investor's portfolio while meeting strict low-carbon financing standards (Oulton, 2009). The European Investment Bank issued the first Climate Bonds in 2007 worth 600 million euros with a five-year maturity period. The initiative is also working on the development of supporting infrastructure to facilitate the investments of these bonds, which contribute to the transition to a low-carbon economy. This initiative has also established a system of standards and certification of climate bonds with the support of asset owners, stakeholders, and non-governmental organizations. Based on this, the Climate Bond Market offers governments a range of policy tools to encourage investment in low-carbon projects. By establishing projects in the

South and promoting the use of low-carbon technological mechanisms, the North can increase investment in these bonds (Sachs, 2012).

Conclusion

The development of human activity, especially in the most developed countries, has caused damage to the global environment. As a result, an ecological debt of the planet has emerged. The concept of environmental debt encompasses two aspects: the material side, which refers to the financial obligations owed to a state or group by countries responsible for environmental damage. The other side, known as the moral side, encompasses all the detrimental environmental impacts on the planet that result from the consumption and exploitation of ecosystems. This contracted environmental debt, as an increase in external debt, made sustainability and development in society impossible. Therefore, analyzing this topic solely from a critical perspective and disregarding environmental and social aspects can result in actions that negatively impact a significant portion of the global population and ecosystems. To increase public awareness of these facts, we must take steps to popularize concepts like environmental debt and collaborate with the social groups most directly affected by these concepts, particularly companies and consumers. Also, the fact that eco-bonds are a relatively new tool in the field of sustainable financing means that developed countries can resort to paying off their historical environmental debts. On one side, the use of eco-bonds to finance projects contributes to environmental preservation and the sustainability of natural resources. On the other side, these eco-bonds are effective mechanism for settling environmental debt.

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