

Relationships of Environmental Economics and Sustainable Development Goals

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Environmental issues have increased, whereas the Earth's natural resources have deteriorated. These problems have forced people and companies to engage in environmental economics to achieve sustainability. However, several barriers have been identified in the implementation of environmental economics. It is proven that environmental economics has many benefits in preventing environmental problems and achieving sustainability. This economic concept also correlates with the majority of the goals of sustainable development programs, assisting many countries in achieving these objectives. There are four strategies identified that are the most utilized: The inclusion of natural capital in the System of National Accounts (SEEA), green consumerism, fiscal policy, and de-growth economic model. The SEEA is correlated with sustainable development goals (SDGs) 1 (No Poverty), 3 (Good Health and Well-being), 6 (Clean Water and Sanitation), 14 (Life below Water), and 15 (Life on Land). Green consumerism aligns with SDGs 3 (Good Health and Well-being), 12 (Responsible Consumption and Production), and 13 (Climate Action). Fiscal policy is correlated with the SDGs 1 (No Poverty), 3 (Good Health and Well-being), 13 (Climate Change), 12 (Responsible Consumption and Production), 14 (Life below Water), and 15 (Life on Land). Lastly, the de-growth economic model aligns with SDGs 1 (No Poverty), 7 (Affordable and Clean Energy), 9 (Industry, Innovation, and Infrastructure), 11 (Sustainable Cities and Communities), 12 (Responsible Consumption and Production), and 13 (Climate Action).

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the sustainable development goals (SDGs)

fiscal policy

green consumerism

de-growth policy

national account

SEEA

1. Introduction

It is acknowledged that various economic activities, including human and industrial activities frequently result in various environmental problems, such as water and air pollution ^[1]. According to the World Health Organization (WHO), water pollution is one of the most major health risks, causing about 2 million human deaths each year. Annually, nearly the same number of premature deaths are caused by air pollution all over the world ^[2]. Air pollution, moreover, can lead to a severe degradation of the atmosphere, as well as many other environmental issues, including climate change, drought, and famine ^[1]. The depletion of natural resources and environmental deterioration are two further environmental consequences of extensive economic activities ^[3]. In the long term, all of these issues will not only disrupt the economy but may also affect society's well-being ^[4]. Considering all of these issues, it is important for all governments, particularly those in developing countries, to implement environmental economics in order to mitigate the negative impacts of economic activity.

While environmental economics is gaining interest among governments and economists, the world has also been introduced to the sustainable development goals (SDGs). The SDGs are arranged by the United Nations for all countries to participate in providing a global framework for achieving global development, while balancing social, economic, and environmental sustainability [5]. The SDGs are an interconnected set of measurable goals designed to address interrelated challenges and achieve global sustainable development as well as trace the sustainability path until 2030 [6].

However, the path to achieving environmental economics and the sustainable development goals might not be so simple. Environmental problems continue to grow in severity, and the solutions provided by environmental economists have proven ineffective [7]. It is also known that the implementation of environmental economics strategies leads to several other consequences, both economically and socially. For example, the rise of the “shadow economy”, which is caused by inefficient fiscal policy. The “shadow economy” has spread to 162 Western countries, accounting for an average of 34.5 percent of official GDP [2]. In Asian countries, the average percentage of the “shadow economy” has reached about 31% of the official GDP. In the long term, the increasing level of the shadow economy can disrupt the stability of the economy [8]. Another consequence is market monopolization, which is found in the implementation of the green consumerism strategy. Market monopolization allows some companies to fully control price limits and maximize their profits, resulting in unfair competition, especially in the market for environmentally friendly products [9].

Despite all of these consequences, achieving environmental economics and sustainable development goals is becoming more difficult, especially for developing countries, due to various limitations, such as a lack of funding, technology, expertise, and human awareness of the importance of sustainable economic activities [10]. Furthermore, to the best of the researcher’s knowledge, no research has looked into the relationship between environmental economics and the SDGs, as well as the potential barriers or consequences of implementing environmental economic strategies.

2. The Relationship between the Inclusion of Natural Capital in the SNA (SEEA) and the SDGs

It is widely accepted that much economic activity is dependent on natural resources and capital, which are termed “environmental assets” in the context of accounting. Therefore, it is important to include the environmental assets and their depletion and degradation into the national accounts. This inclusion also broadens the evidence basis for economic assessment and decisions on sustainability. Moreover, it is known that some environmental assets are a concern in environmental accounting systems as well as the sustainable development goals (SDGs) program. For example, by using the environmental-economic accounting system, environmental assets can be physically measured, such as tons of fish and minerals, cubic meters of water and timber, and hectares of land [4]. These assets are also known to become the targets of SDGs 14 (Life below Water) and 15 (Life on Land). The physical measurement of the resources in the water and land as well as their depletion and degradation can provide important economic information (such as the availability of resources for recent and future usage, how much these resources have been explored, what measures can be applied to address or prevent these issues, how much it

costs to address these issues, etc.) and environmental policy purposes (such as the regulation of natural resource utilization, or the conservatory program for natural resources, etc.).

Another environmental asset that is included in environmental-economic accounts is the degradation of the ecosystem, in particular the loss of regulating services, such as flood protection, water purification, and air filtration. Flood protection is identified as having a relationship with the SDGs 1 (No Poverty) and 3 (Good Health and Well-being) ^[11]. Without the threat of flooding, humans can live in a healthy environment, allowing them to achieve good health, both physically and mentally. Moreover, people who have good physical and mental health will be able to perform better at work, which in turn, allows them to earn higher salaries. The more people who earn higher wages, the more poverty problems will be solved.

Water purification and air filtration, on the other hand, are correlated with the targets of SDG 6 (Clean Water and Sanitation), which is also related to the targets of SDG 3 (Good Health and Well-being). The lack of water purification and air filtration will cause severe environmental problems such as polluted air and water. According to the World Health Organization (WHO), air pollution kills over 7 million people per year, and nearly 90% of the world's population breathes polluted air ^[1]. It was also revealed that the worst levels of air quality, particularly in developing countries, have an impact on human capital accumulation and company performance ^[12]. This is due to the fact that those who are skilled and qualified but sensitive to low air quality may flee the impacted locations to enjoy greater wages and a better quality of life. As a result, it is more difficult for companies in more polluted locations to recruit high-quality staff, resulting in a loss of human capital and, in the long term, a reduction in corporate performance ^[13]. Employees that have a better understanding and knowledge of the negative consequences of air pollution are also more sensitive to the issue ^[14]. This suggests that air pollution can have an influence on human well-being, which is one of the targets of SDG 3.

3. The Relationship between “Green Consumerism” and the SDGs

Green consumerism is one of the environmental economic strategies used to reduce the adverse environmental impacts caused by human and economic activity. Consumers with a “green consumerism” perspective are willing to give higher value and pay more for products that are more environmentally friendly. Environmentally friendly products mean less damaging product usage and manufacturing ^[9], which is also a key factor in reducing climate change. The beneficial effect of green consumerism on climate change is aligned with the targets of SDG 13 (Climate Action).

Furthermore, some consumers are optimistic about their capability to improve and solve environmental problems by engaging in recycling activities, reducing their consumption of electricity, and purchasing environmentally friendly products. Thus, these consumers tend to be satisfied with their social life because they may believe that they are creating good things for society. This is how “green consumerism” can enhance consumers' well-being. Moreover, the consumption of green food is often viewed as a type of green consumerism. This habit reflects consumers' purchase behavior toward green food products that are perceived as safe, environmentally friendly,

and healthy ^[15]. The concerns for health and well-being are aligned with the targets of SDG 3 (Good Health and Well-being).

However, the “green” perspective is perceived not only from the consumer standpoint, but also from the supplier’s perspective. On the supply side, it is well-known that companies are under a lot of pressure to go green. Consumers, bankers, investors, and other stakeholders are urging companies to reduce their adverse environmental impacts. This is known as “Firms’ Social Responsibility” (FSR), or “Corporate Social Responsibility” (CSR) ^[16]. This green movement is correlated with the targets of SDG 12 (Responsible Consumption and Production).

4. The Relationship between Fiscal Policy and the SDGs

It is recognized that fiscal policy as the management of taxation and government expenditure is commonly used to achieve macroeconomic stability ^[17] and address issues such as unemployment and economic stabilization ^[18]. Another function of fiscal policy is to solve structural long-term problems such as expanding access to health care, improving education, reducing poverty, and in particular, addressing environmental issues in various countries ^[18]. In this regard, fiscal policy correlates with the targets of SDG 1 (No Poverty).

Regarding environmental problems, environmental economists argue that external costs can be internalized by adjusting the prices of goods or services. This can be carried out by means of a charge or a tax. For instance, a firm discharging waste and polluting river might be charged a fee to cover the cost of lost recreational amenity and fish life. As a result, external costs will become a factor in a polluter’s decision in the future ^[19]. Based on this, fiscal policy can also be used to protect life on land and water, which are targeted in SDGs 14 (Life below Water) and 15 (Life on Land).

However, if the pollution charge is equal to the cost of environmental damage, then the theory is that a company could clean up its pollution until it is cheaper to pay a charge than to reduce pollution. In the long-term, this practice can be economically efficient because the external costs to the firm will outweigh the benefits to those suffering from the impacts of the pollution. Economists believe that this measure is less optimal for the community because the polluter is better off than they would be having paid to entirely eliminate the pollution, while the community is not worse off because the damage is being compensated by the firm through tax payments to or fines from governments. The assumption of internalizing the costs is that environmental damage can be compensated for and that this is as good as, or even preferable to, preventing the damage in the first place ^[20]. Therefore, rather than expecting environmental taxes to fully cover the cost of environmental damage, it is better for firms to improve their technology by reducing their emissions or waste ^[21].

The reallocation of government expenditure on technological diffusion and research and development through public goods can stimulate the utilization of cleaner technologies. Cleaner technologies will suppress the level of pollution in water and air ^[22]. A healthy society, physically and mentally, is easily achievable with cleaner water and air. Moreover, it is acknowledged that raising taxes will reduce air pollution. Additionally, higher fuel taxes and a

greater CO₂ sensitivity of registration taxes for new cars can reduce CO₂ emissions in 15 European Union countries. This occurred when taxes encouraged people to buy more fuel-efficient cars in the years 2001–2010 [23]. Other studies also found that CO₂ taxes may be a crucial fiscal tool for reducing air pollution, as well as promoting fiscal consolidation in Portugal. Their simulation results indicate that CO₂ taxes can align with the current climate policy goals. This suggests that fiscal policy also aligns with the targets of SDG 13 (Climate Change) [24]. These goals, which are related to the reduction in air pollution, are related to the targets of SDG 3 (Good Health and Well-being). In addition, all of these fiscal policy schemes, through tax, government expenditure and environmental policies, illustrates a picture of responsibility in consumption and production, especially towards environmental problems, which are aligned with the targets of SDG 12 (Responsible Consumption and Production).

5. The Relationship between the De-Growth Economic Model and the SDGs

De-growth is known as one of the economic models that applies a reduction in production and consumption in order to improve human well-being and ecological conditions at both local and global levels in the short and long-term. Following this, de-growth movements succeeded in reducing the impacts of air pollution as well as climate change [25]. This proves the correlation between de-growth model goals and the targets of SDG 13 (Climate Action). As explained before, people who live without the threat of climate change, drought, flood, and famine can easily achieve a healthy life and good physical and mental health. Thus, these people have a better work performance, which allows them to earn a higher wage and live a wealthier life. In this sense, poverty issues are solved (SDG 1: No Poverty).

The practice of the de-growth model can also be seen in the agriculture sector [26]. Studies revealed that unsustainable production processes can be solved using organic farming (changes in process) and new patterns of consumption, such as following a more vegetarian diet, as well as consuming seasonal products (changes in products). Changes in processes can help to reduce waste, decrease the amount of energy used, and incorporate new energy sources. On the other hand, changes in products can help to produce goods that last longer and decrease the energy used in the process. These actions illustrate a picture of responsible consumption and production, which are aligned with the targets of SDG 12.

Furthermore, the implementation of the de-growth model is identified in the projects of Triodos Bank, a bank of Dutch origin that specializes in financing institutions, companies, and projects with high social, cultural, and environmental value. The majority of its funded projects are in the categories of education, organic farming, the cultural industry, energy efficiency, and sustainable building [27]. This is how the de-growth model aligns with the targets of SDGs 7 (Affordable and Clean Energy), 9 (Industry, Innovation, and Infrastructure), 11 (Sustainable Cities and Communities), and 12 (Responsible Consumption and Production).

Despite all the benefits of the de-growth model, which aligns with the SDGs, an important thing to note is that implementing a de-growth model does not stop a company from growing and achieving benefits. The de-growth economic model, moreover, can be applied without sacrificing profitability [27].

6. The Possible Barriers or Consequences of Implementing Environmental Economics

It is acknowledged that human and economic activities can lead to various environmental problems, such as the depletion and degradation of natural resources, water and air pollution, climate change, and so on. In the long term, environmental problems can have a severe impact on human life, both physically and mentally, as well as disrupting economic stability [28]. Therefore, it is essential to implement environmental economics to reduce environmental problems and create a more sustainable society. However, the implementation of environmental economics is not without criticism. Several barriers that may arise from the implementation of environmental economics have been identified.

It is widely accepted that in the practice of environmental economics, the inclusion of environmental assets, including their changing values, in the national account is critical. This practice is known as the system of environmental–economic accounting (SEEA). The SEEA thus provides a system that can be used to monitor a significant number of the SDGs targets in a consistent and integrated manner [29]. However, despite all the benefits of SEEA utilization, not all economists or policy makers fully understand the importance of the changing values of environmental assets and widely accept them in the main economic policy areas. As a result, there has been little demand for information on these changes to be included in the SEEA [4][30]. Moreover, for many years, it has been challenging for some countries, especially developing countries, to compile various data from all of their resources, including those regarding depletion and degradation. Even though the number of countries using the SEEA program has increased, the majority of them (65% of the countries) require technical assistance in compiling and developing SEEA. This assistance is mostly derived from non-governmental and international organizations or other institutions in compiling and/or developing specific modules. In addition, only 45 out of 69 countries have consistent funding to continue compiling and publishing their accounts [31].

Furthermore, to succeed in environmental economics programs, many companies are encouraged to become “greener”. This means that companies should implement more sustainable processes in all of their production process in order to prevent environmental problems. However, becoming a “greener” company requires a lot of effort due to the many difficult requirements that should be fulfilled. For example, The Federal Acquisition Regulation governs green business movements in the United States. This regulation provides a detailed code of rules that must be fulfilled by the Environmental Protection Agency (EPA) for accessible sources and potential uses of recovered materials and associated products, as well as solid waste management services. Thus, companies would have to establish a federal agency to develop and administer affirmative procurement programs for EPA-designed products [32]. These requirements are quite difficult to fulfill, especially for infant or startup companies due to a lack of expertise, resources, funding, and technology.

It is also acknowledged that in the practice of “green movements”, several types of fraud were identified, including “greenwashing”. Greenwashing was first described by activist Jay Westerveld in 1986, when hotels began asking guests to reuse towels under the guise of a company water conservation strategy, despite the fact that this did not contribute to any significant measures addressing environmental impact issues [33]. With the increase in green

movements, followed by greenwashing, a trust problem emerged whereby customers have difficulty identifying a true green activity. This phenomenon is known as “green skepticism” [34]. Regarding “greenwashing” issues, developed countries that have a greater environmental awareness have a higher level of regulation to control this problem compared to developing countries [35]. This becomes another form of issue that needs to be solved in order to protect customers from the harmful effects of the phenomenon of greenwashing.

Another barrier may arise from the implementation of fiscal policy. It is acknowledged that fiscal policy, through governments’ expenditure and taxes, can reduce environmental problems, such as air pollution and natural resources depletion, reducing poverty [22]. However, it is identified that taxes will actually increase pollution in the presence of pollution abatement subsidies. This might happen when subsidy policy is influenced by local industry and environmental lobby groups. On the other hand, pollution abatement subsidies lower the marginal cost of the polluting firm, and therefore stimulate output. As a consequence, pollution taxes may increase pollution if the output effect of the subsidy is greater than the reduction in pollution intensity per output unit [36].

Another consequence of fiscal policy is the rise of the “shadow economy”. The shadow economy is defined as an all-market-based legal production of goods and services that is intentionally hidden from public authorities to avoid paying income, value-added or other taxes, and social security contributions. The shadow economy allows companies to avoid having to comply with some legal labor market norms, such as minimum wages, safety standards, maximum working hours, etc., and with certain administrative procedures, such as completing statistical questionnaires or other administrative forms [37]. It is known that a high level of shadow economy activities cause an increased level of polluted air due to the fact that companies can avoid environmental regulations for their underground production [2].

Lastly, a possible barrier is derived from the de-growth model. Contrary to the green-growth model, de-growth is an economic model that prevents environmental problems and achieves sustainability through anti-consumerism and social movements [1]. For academics and environmentalists, the appeal of de-growth is clear: the assumption that all growth is damaging to the environment, not only due to the problems of conceptualizing and measuring the quality of growth, but also potential environmental injustices during the transition period, where brown and green growth can co-exist [38]. The problem of de-growth is that this model does not resonate well with policy makers, especially those in poor countries with structural inequalities, where most sectors of the population need to grow out of poverty [39][40].

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