

# The Importance of Green Bonds in Financing the Sustainable Environment<sup>1</sup>

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## Abstract

Goods and services produced for people's unlimited demands for goods and services are limited. Natural resources, which are among the factors of production, are succumbing to the demands and ambitions of consumers. Sustainability of natural resources is vital not only for protecting the environment and ensuring the continuity of production, but also for leaving a livable world to future generations. It is imperative that individuals, the private sector, the public sector and international organizations work together to combat the negative externalities of production and consumption activities. Capital market instruments created to meet the financing needs of the private sector can serve a sustainable environment. Public incentives for green bonds issued by companies with proven environmental sensitivity will help raise and spread environmental awareness. Consumer awareness will increase the environmental sensitivity of private sector firms. The contradiction between the limited natural resources and the unlimited demands of people brings environmentally sensitive financing instruments to the forefront in terms of sustainability of natural resources.

**Keywords:** sustainable environment, ecology, negative externality, green bond, Türkiye

**Jel Codes:** H23, K34, P18

## Sürdürülebilir Çevrenin Finansmanında Yeşil Tahvillerin Önemi

### Özet

İnsanların sınırsız mal ve hizmet talepleri için üretilen mal ve hizmetler sınırlıdır. Üretim faktörleri arasında yer alan doğal kaynaklar tüketicilerin talep ve hırslarına yenik düşmektedir. Doğal kaynakların sürdürülebilirliği, yalnızca çevrenin korunması ve üretimin sürekliliğinin sağlanması açısından değil, gelecek nesillere yaşanabilir bir dünya bırakılması açısından da hayati önem taşıyor. Üretim ve tüketim faaliyetlerinin olumsuz dışsallıklarıyla bireylerin, özel sektörün, kamu sektörünün ve uluslararası kuruluşların birlikte mücadele etmesi zorunludur. Özel sektörün finansman ihtiyacını karşılamak amacıyla oluşturulan sermaye piyasası araçları sürdürülebilir bir çevreye hizmet edebilir. Çevre duyarlılığı bugüne kadar kanıtlanmış şirketlerin ihraç ettiği yeşil tahvillere ilişkin yapılacak kamu teşvikleri, çevre bilincinin oluşmasına ve yayılmasına yardımcı olacaktır. Tüketici bilincinin oluşması özel sektör firmalarının çevre duyarlılığını artıracaktır. Doğal kaynakların sınırlı olması ve insanların sınırsız talepleri arasındaki çelişki, doğal kaynakların sürdürülebilirliği açısından çevreye duyarlı finansman araçlarını ön plana taşımaktadır.

**Anahtar Kelimeler:** sürdürülebilir çevre, ekoloji, negatif dışsallık, yeşil tahvil, Türkiye

**Jel Kodları:** H23, K34, P18

<b>Research and Publication Ethics Statement</b>	The study does not require an ethical committee approval.
<b>Contributions of the Authors</b>	The contribution of H.M.A to the article is 40 % the contribution, A.S. is 30% and the contribution of N.G.A is 30%.
<b>Conflicts of Interest Statement</b>	There is no conflict of interest.

<sup>1</sup> This study was presented as a paper at the International Congress of Climate Change Effects on Health, Life, Engineering and Social Sciences (ICLIC) on 27-30 September 2022 and published as a full text (pp.109-114).

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## 1. Introduction

Goods and services are produced to meet human needs. Within the economic system, goods and services are produced by the introduction of production factors into the production process by the public and private sectors. Production is the name given to the efforts to create goods and services that will meet human needs directly or indirectly. While the purpose of the private sector is to increase its profits, the public sector increases the social benefit. Firms with private sector representatives ignore nature in order to make more profit. Production is the activities carried out to increase the quantity or utility of limited goods and services in order to meet their unlimited and constantly increasing needs. Factors of production consist of labor, capital, entrepreneur and land (natural resources) used in the production process. Soil, or in a broader sense, natural resources, is all the wealth that has arisen spontaneously in nature, in which there is no effort and technique of the human factor. These self-created riches have the characteristics of being animate and inanimate. Living and non-living natural resources are ready-made riches that facilitate human life and help it continue. Air, water resources, agricultural lands, oil, wind, forests and natural vegetation are among the natural resources (Gürler et al., 2017, p. 15). Natural resources are divided into renewable and non-renewable resources. There is a risk of deterioration in the quality of resources such as water, air and soil from renewable resources as they are used. Minerals such as oil and coal from non-renewable resources have the risk of depletion and polluting the nature. Natural resources have the feature of being scarce compared to other production factors (Başol et al., 2005, p.64).

Capital factor defines physical tools such as money, machinery, equipment, factory. At the beginning of industrialization, entrepreneurs are also capitalists. Factors such as the increase in consumption, new inventions and technologies that encourage production, companies that cross national borders, and globalization have increased the capital need of entrepreneurs. Capital markets, other than banks, meet this need of entrepreneurs or companies with increasing demand for funds. The market is where buyers and sellers exchange money and goods. The market can be physical or virtual, local or global, perfect or imperfect. The value, cost and pricing of the products in the market are related to the supply and demand in the market (The Economic Times). The transfer of funds with the capital market is more efficient and organizations that have more productive ways to invest in funds contribute to economic growth by using these funds (Darškuvienė, 2010, p. 6).

While the market where the supply and demand of goods and services are faced is the real market, the market in which people with excess funds supply their savings to people with a shortage of funds is called the capital market (SPLSEK, 2014, p. 4). Is the name of the modern financing system consisting of intermediary and auxiliary institutions such as banks, investment trusts and investment funds. This market has advantageous features for different participants in the economy. For a company in need of financing, it provides an alternative financing source outside the bank that can complete its financing. The capital market can offer better pricing and longer maturities, as well as access to a wider investor base (International Finance Corporation World Bank Group, 2017, p. 1).

With the development of capital markets, capitalism has become dependent on a wild increase in production. This situation has brought along a production approach in which social and environmental conditions are ignored. All world resources, especially the natural environment and resources, are rapidly depleted as a result of production and even consumption activities. Developed countries and international organizations that are aware of this apply some measures, although not enough, to give due importance to the environment, which is the primary source of production, and to all processes of ecological systems. Countries that impose some sanctions, especially tax and incentive policies, take initiatives to protect the environment and increase its sustainability. It is inevitable to take some necessary measures and increase the effectiveness of these measures in order to combat problems with devastating consequences such as global warming and climate change, which individuals, companies and public institutions cannot remain indifferent to.

The most commonly used debt instruments in the capital market are bonds and stocks. Bonds are debt securities with an obligation to repay the principal and interest. Their maturity is longer than one year. A

share is a valuable document issued by a company and represents the partnership capital share. It does not offer interest income as in bonds, it gives a profit share at the end of the period. Some Swedish pension funds have explored opportunities and made a number of initiatives to support environmentally responsible solutions through Skandinaviska Enskilda Banken (SEB). These funds exchanged information with the World Bank on the effects of the investments made. As a result of the studies carried out to design a different and new product, the concept of green bond was born (The World Bank, 2018, p. 5). Countries targeting low carbon are making changes in providing the necessary financial capital. Revenues provided through green bonds will be directed to sustainable assets and will take their place in the capital market as fixed income securities (International Energy Agency, 2020, p. 3).

## 2. Ecology and Economics

The term ecology is derived from the Ancient Greek words “oikos” meaning home, family and “logos” meaning science (Schwartz and Jax, 2011, pp. 145-146). This concept was first introduced by Reuter in 1865. A year later, in 1866, Haeckel developed the word "ecology" as it is used today (Rich, 2021, p. 1; Zengin, 2021, p. 1). Ecology is the science that determines the regional distribution and quantity of organisms and examines their mutual relations. Ecology has important rules that have been determined as a system. When these rules are violated, humans and other creatures pay a price. In order not to encounter man-made risks, it is necessary to take into account the basic ecology laws. Some laws of ecology are: (Kıslalıoğlu and Berkes, 1999, pp. 20-26; Callenbach, 2011, pp. 50, 136; Fukuoka, 2006, p. 44):

- Nature is a whole,
- Nature is limited,
- Nature controls itself,
- Diversity is essential in nature,
- Nothing will disappear,
- No benefit for free,
- Every action produces a reaction,
- Nature finds the most suitable solution.

Humans are faced with many environmental risks. These risks can be grouped as exogenous and manufactured risks. External risks are natural disasters such as floods, droughts, famines and earthquakes. Manufactured risks arise as a result of excessive human intervention in nature (Giddens, 2012, p. 106). Global warming, nuclear risk, decrease in potable water resources, air pollution are some of the produced risks. The transition from the agricultural society to the industrial society has accelerated the intervention of man in nature. The wild consumption of natural resources has increased as a result of the production ambition of multinational companies. The rhetoric that 'poverty is a hierarchical problem, while air pollution is a democratic problem' has begun to gain acceptance. As a matter of fact, according to the report titled "Limits to Growth" published by the Rome Association in 1972, economic growth states that it pushes the limits of natural resources. The 'Brundtland' report (Our Common Future) prepared by the United Nations in 1987 introduced the concept of 'sustainable growth'. This report has been prepared to meet the needs of today's people without jeopardizing the natural resources that future generations need. However, excessive consumption and the profit ambitions of entrepreneurs and capitalists pushed the limits of production and increased the negative externalities of companies that harm the environment. Examples of the pressures of consumption on ecology; increase in the use of fossil fuels, decrease in forests, environmental pollution, decrease in water stocks.

According to Simon Kuznets, winner of the Nobel Prize in economics, underdeveloped or developing countries necessarily harm the environment during their industrialization processes. Even if the level of technology is a little low, ecological degradation can reach frightening proportions (Grundmann, 1991, p. 23). However, this environmental degradation can be reversed as the country successfully overcomes the industrialization process and progresses towards becoming a developed country. Kuznets measures this level of development when per capita income exceeds \$10,000. Countries that reach this income level now

have the necessary technical knowledge, technology and capital to combat environmental degradation and other market failures (Kuznets, 1955, p. 17; Torras and Boyce, 1998, p. 152). British Economist Robert Coase has put forward a theorem claiming that the effect of negative externalities can be terminated within the market mechanism. Thus, optimum resource allocation will be achieved in free competitive market conditions. Coase cites as examples the factory polluting the river for environmental problems or environmental negative externalities and the residents of the towns that are negatively affected by it (North, 1992, p. 24).

Paul Sweezy (1989, pp. 8-9) explains capitalism's pressure on the environment as follows: "What distinguishes capitalism from a simple system that meets the basic needs of human beings is its obsession with capital accumulation. A system that is limited by capital accumulation or excessive profit concerns has no chance to stand still. It replaces the old production and distribution relations with new ones, opens new areas and new markets in line with its aims, makes societies and countries incapable of protecting themselves dependent on itself. As a result of unbridled renewal and development, this diseased system, which is always in search, does not even spare its owners. In the case of a natural environment or ecosystem, capitalism does not see these values as something that should not be harmed. Rather, it sees nature as the main source of greater profits and greater capital accumulation". In the absence of humans, nature has a structure that can provide its own sustainability. However, measures should be taken to protect the sustainability of nature against humans (Mengi and Algan, 2003, p. 60).

The subject of economics is scarce resources and human needs. The gradual decrease of scarce resources and the increasing variety and number of human needs have increased the importance of economics. In addition to economics, the support of public policies such as tax, finance, incentive and penalty policies is required. Negative externalities caused by firms depend on strict policies to be followed by states and international organizations. Ecological economists, on the other hand, have worked on environmental problems and sustainability since the 1970s and have attracted the attention of the public. Ecological economists argue that natural resources are scarce resources that are largely irreproducible. They argue that these resources cannot be substituted by technology and other factors of production such as labor or capital. They even think that market-oriented solutions will harm the ecology more. These economists, considering that sustained economic growth, frantic consumption endanger the sustainability of future generations, recommend zero economic growth, shrinkage or very moderate growth models.

Energy production and consumption show the level of development of countries and societies. Therefore, energy is an important factor of economic and social development. The intensive use of energy in production and consumption has led countries, international organizations and non-governmental organizations to focus on the issue of sustainability. Global public goods such as global warming and air pollution have increased the environmental awareness of public administrations and conscious producers and consumers. The governments of countries aiming at low carbon go to different quests in finding the financial capital needed. At this point, a livable world will be left to future generations within the framework of principles such as resources to be obtained with green bonds, sustainable environment, reducing pollution and turning to renewable energy sources.

### **3. Green Bonds and Environmental Sustainability**

Green bonds are fixed income securities issued to raise capital to further finance or refinance initiatives that contribute to the improvement of the natural environment. These bonds differ from regular bonds in the commitment to use the funds (Jun, Kaminker, Kidney and Pfaff, 2016, p. 4). However, like conventional bonds, green bonds also guarantee principal and interest income by the issuing companies. Green bonds aim to develop a low-carbon and climate change-resilient economy beyond providing financing needs to companies (Menteşe, 2021, p. 96) and providing income to savers (Laskowska, 2017, p. 71). Green bonds are seen as one of the newest instruments in the global financial world. Green bonds are issued by the government, private sector or multilateral organizations to finance climate-friendly and environmental projects (Kandır and Yakar, 2017, p. 161). Funds from these bonds are used for ecological purposes.

Besides supporting the environment, the main purpose of green bonds is fixed income. For this reason, it is seen that it is not much different from classical bonds. Green bonds were first issued by the European Investment Bank in 2007 under the name of climate awareness bond. One year later, in 2008, the World Bank used the term “green bonds” and started issuance. Although green bonds are used for all green projects, they attract more attention especially in the fields of renewable energy and energy efficiency. (Irena, 2020, p. 3).

The green bond market can offer several important benefits for green investment (Jun, Kaminker, Kidney and Pfaff, 2016, pp. 5-6):

- Providing an additional source of green financing,
- Enabling more long-term green financing by addressing maturity mismatch,
- Enhancing issuers’ reputation and clarifying environmental strategy,
- Offering potential cost advantages,
- Facilitating the “greening” of traditionally brown sectors,
- Making new green financial products available to responsible and long-term investors.

Green bond principles are voluntary process guides that give importance to the development of the green bond market, transparency of the issuance of green bonds, and information sharing. Green bond principles have four basic components (Menteşe, 2021, p. 100): 1- Terms of use of the fund 2- Project evaluation and selection process 3- Income management 4- Reporting.

In 2020, the global green bond issuance exceeded US\$270 billion. The issuances were mostly realized in US dollars and Euro currencies (Irena, 2020, p. 9). Cumulative issuance of green bonds is less than \$1 trillion. As the global bond market hovers around USD 100 trillion, the share of green bonds in the total bond market is less than 1%. Many green bonds finance more than one "green" category. Regionally, 21% of green bonds in Europe, 19% in Africa, 16% in America and 14% in Asia Pacific are allocated to renewable energy (Irena, 2020, p. 10).

Highlights for 2021 (Amundi and IFC, 2022, p. 3):

- US\$ 95 billion emerging market green bond issuances in 2021,
- 58% increase in emerging market ex-China green bond issuances from 2020,
- US\$ 323 billion emerging market green bonds cumulative issuance through 2021,
- US\$ 64billion emerging market social, sustainability, and sustainability-linked bond issuances in 2021,
- US\$ 150billion projected annual emerging market green bond issuance by 2023,
- 50 emerging markets have issued green bonds since 2012,
- 7 emerging markets with debut green offerings in 2021,
- 77 basis points outperformance of emerging market green bonds.

There are exchanges with special sections for sustainable, social and green bonds. They are traded on stock exchanges such as Oslo, Stockholm, London, Shanghai, Mexico, Luxembourg, Italy, Taiwan, Japan, Nasdaq (Helsinki, Copenhagen, Baltic), Moscow under different names such as green bonds, sustainable bonds, green and social bonds (CBI, 2022).

#### **4. Green Bond Market and Its Future in Türkiye**

In Türkiye, green bonds were first issued by the Industrial Development Bank of Türkiye in 2016. The issuance, with a maturity of 5 years and an amount of 300 million dollars, was demanded 13 times more than the planned amount. It received a demand of 4 billion dollars from 317 institutional investors in international markets. 44% of the demand for bond issuance in the Irish Stock Exchange came from the UK, 39% from Continental Europe, 9% from US off-shore funds, and 8% from Asia and the Middle East. The fund provided by this issuance, realized under the coordination of seven banks authorized by TSKB, is used only in financing green and sustainable projects. With this resource obtained according to the impact

report published by TSKB in 2016, 5 renewable energy projects with a total installed power of 606.9 MW, 5 in hydroelectric and 2 in the wind field, a city hospital project in Ankara, 5 electricity distribution projects. Financing was provided for 4 port projects and 2 energy and resource efficiency projects in the Marmara region (Yeşil Ekonomi, 2017).

The companies that issue green bonds in Türkiye are: YDA Group, Rönesans Healthcare Investment, Garanti BBVA, Yapı ve Kredi Bankası A.Ş., Vestel Elektronik Sanayi ve Ticaret A.Ş., QNB Finansbank, Arçelik A.Ş., Aydem Energy, Tough Energy. A significant portion of the green project investments made in Türkiye goes to the financing of renewable energy. Along with this, it is seen that banks that support environmental projects tend to sustainability funds, green mortgages and green vehicle loans. (Yazıcı, 2020, p. 8).

On April 9, 2019, Istanbul Technical University hosted the 6th Istanbul Carbon Summit, organized by the Sustainable Production and Consumption Association (SÜT-D). The summit's focus was on achieving a green economy path to prevent global warming from exceeding 1.5 degrees through carbon management. During the 5th summit in 2018, which focused on 'Climate Finance', competent speakers and delegates discussed climate and carbon finance, climate change mitigation mechanisms, climate change support and financing programs, the Green Climate Fund, green bonds, and compulsory and voluntary carbon markets. At the summit, the 'Low Carbon Hero Award' was presented to institutions and individuals who had reduced their carbon footprints (İKZ, 2019, p. 2).

The proliferation of private sector debt instruments issued as green bonds will increase both the stock market trading volume and clearing commissions. There is no separate regulation regarding green bonds in the SPK (Capital Markets Board). Currently, all issuances from TR are recorded on the Irish Stock Exchange by TSKB. The Irish Stock Exchange was chosen due to its low cost and systematic habit, but it is not in the targets since the domestic bonds will be in TL and the investor will be limited (Menteşe, 2021, p. 113). For this reason, incentives are necessary.

Tools such as green bonds, public-private partnership and other institutions in Türkiye have only just begun to be discovered with the support provided by multilateral development banks (OECD, 2019, p. 114). Supporting green finance flows and a significant achievement in financial innovation, green bonds are an effective tool for the fast-growing and emerging asset class to manage climate risks and finance low-carbon assets (Dünya Enerji Konseyi, 2018).

In academic studies, tax policies have a positive relationship with capacity for all renewable energy types. In Türkiye, although there are tax reductions within the scope of general investment incentive policies, there is no specific tax incentive for renewable energy investments. According to the results obtained, tax policies should be implemented more effectively for the development and diffusion of renewable energy in Türkiye. In this context, in addition to general investment incentive policies, it is considered that the development of tax incentive mechanisms such as tax reductions, exceptions, exemptions and tax credit policies applied in developed countries will be effective in the development of renewable energy (Kaplan, 2021, p. 157).

Since Türkiye is a candidate country for the EU, it must adopt effective incentive policies in line with the renewable targets of the EU. It is thought that the continuation of incentive policies, especially the fixed price guarantee, which has been effectively implemented since 2010, will further increase investor interest in renewable energy. However, the tariffs applied in the fixed price guarantee policy in Türkiye are given in Turkish Lira instead of US dollars as of July 2021. In the upcoming periods, it is considered that it would be more appropriate to continue the tariff implementation in US dollars in the current economic conjuncture.

- Things to do to develop the green bond market in Türkiye are as follows:
- Green bond standards should be determined.
- In order to evaluate whether the bond is “green”, an internal and external evaluation should be made.

- Tax incentives should be brought to green projects.
- Borsa İstanbul (BIST) should make decisions to encourage the issuance of green bonds.
- Necessary arrangements should be made for green sukuk.
- Green bond markets should be established in Borsa İstanbul.
- A green bond index should be established.
- Consumer awareness should be created.
- The developments in the world should be followed closely and necessary steps should be taken without delay.

## 5. Conclusion

Financing a sustainable environment is a must for the people of today and tomorrow. Although the destruction of nature by human beings is very old, studies on the sustainability of nature are unfortunately more recent. Since global problems affect all people, finding a solution is closely related to all countries. It is a necessity to take joint decisions on global issues such as global warming, migration, decrease in water resources and air pollution by economically powerful and large countries and supranational institutions. There is also a need for conscious consumers and companies with environmental awareness regarding the sustainability of the environment. At this point, it is important for companies to abandon fossil fuels and turn to renewable resources. In order for sustainability to turn into an economic model, the tools of conventional financing were insufficient and lost its popularity. The interest in green finance instruments has increased and thus alternative financing has become a necessity.

Countries targeting low carbon are making changes in providing the necessary financial capital. Revenues provided through green bonds will be directed to sustainable assets and will take their place in the capital market as fixed income securities. Green bonds are fixed income securities issued to raise capital to further finance or refinance initiatives that contribute to the improvement of the natural environment. Today, clean energy means renewable energy. These energy sources, their dependence on foreign reduces and creates employment. Renewable energy financial incentives, tax breaks, extension of purchase guarantee, land usage opportunities, speeding up bureaucratic procedures and information sharing, international cooperation, opportunities need to be diversified.

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