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Environmental Taxes as A Contemporary Approach to Developing the Libyan Tax System

Dr. Fareg Mustafa Abodher

Department of Accounting, Faculty of Economics and Commerce, Alasmarya Islamic University, Zliten, Libya

Abstract:
Given the increasing interest in environmental issues in recent decades, environmental taxes have emerged as a mechanism for reducing environmental pollution and protecting the environment. This paper highlights the concept of environmental taxes and reviews the most important motivations behind their adoption. Environmental taxes are an important tool that can help reduce negative environmental impacts and improve environmental performance, as well as achieve environmental sustainability. A review of previous literature shows that most countries that apply environmental taxes in their tax system are developed countries, while in developing countries, especially Libya, environmental taxes are still not applied. In fact, the issue of environmental taxes is still in its early stages in developing countries, especially in Libya. This paper contributes to the environmental tax literature by clarifying the extent to which this type of tax can be applied in Libya as a developing country, and the possibility of using environmental taxes to develop the Libyan tax system. Environmental tax reform could provide a double return in the form of a tax system; less distorted money as well as a less polluted environment. Therefore, this paper provides an important theoretical basis for improving tax policy design and reducing environmental pollution, and for further practical research on environmental taxes in the future. It proposes conducting a practical study to obtain the opinions of non-governmental organizations and stakeholders.
Keywords: environmental taxes, pollution, double return, Libya.

1. Introduction:

In general, the primary goal of any tax system in imposing various taxes is to provide financial resources to the state. Which, in turn, is used to meet public spending needs and carry out its assigned functions, additionally to achieving other goals, including: financial, economic, and social. For example, taxes are used to redistribute and thus reduce the unequal distribution of wealth. Governments also use taxes to direct the private sector and protect domestic producers (Avi-Yonah, 2006). In recent decades, taxes related to the environment, known as environmental taxes, have appeared, mainly aiming combating pollution and improving the quality of the environment. Environmental protection is an important issue for the world, and pollution negatively affects the population and endangers future generations. Therefore, adopting measures such as environmental taxes is important to improve behavior (Santos et al., 2025).With the increasing interest in environmental issues in the

Corresponding author. Email: f.abuthair@asmarya.edu.ly
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world, Libya has drawn the world's attention by ranking 20th in the world for the most polluted countries in the air during the year 2023 (Adekunle, 2024). In the midst of the serious environmental challenges facing Libya after this global classification, the government must take this matter seriously. Addressing environmental violations is a collective responsibility involving the public and private sectors and people, towards achieving sustainable environmental goals (Generis Global, 2024)

Growing concerns about climate change have put environmental issues at the top of the political agenda in many countries of the world. Environmental taxes and other economic tools can have an important role in achieving effective control of environmental pollution. Its contribution to revenues also has many broader implications for economic and financial policy. In the 1990s, many countries around the world, especially European countries, imposed environmental taxes, such as carbon taxes. Recently, attention has increasingly turned to environmental taxes, although there is still no global agreement on a carbon tax, many countries, especially developed countries, have implemented implementation plans for environmental taxes (Martinsson et al., 2024). Therefore, the government in developing countries should intervene by imposing such a tax, making pollution more expensive for polluters. If producing pollution becomes more expensive, this will lead to the polluter producing less pollution.

Previous literature indicates several important advantages of environmental taxes, which can generate good revenues within the state’s tax system, and also eliminate the problem of external economic effects. Dahmani, (2024) study provided empirical evidence that environmental taxes play a very important role in dropping environmental pollution and reducing greenhouse gas emissions and the association is negative between environmental taxes and environmental pollution. The study recommended adopting and developing a more efficient environmental tax policy and also recommended granting tax exemptions to establishments that rely on green technology in their industry. Although taxes are sometimes effective in reducing pollution, this performance cannot be relied upon alone; efforts must be intensified at all levels to achieve environmental goals and sustainable development (Alshawabkeh, 2025). In addition, Soares (2011) argued that, the double dividend the utilize of environmental taxes can produce environmental benefits, as well as a financial return. Its revenues can also be used to reduce the distortions that occur from tax imposition, which in turn leads to achieve positive economic results related to the fair distribution of income, the efficiency of resource allocation, employment, and economic growth.

Bluffstone (2003) argued that there are two motivations for developing countries to adopt environmental taxes. The first is that these taxes increase state revenues, and if these revenues are used well in developing countries that suffer from resource shortages, environmental taxes will increase the welfare of those societies. The second motivation is that this type of tax reduces negative externalities, because it forces polluting companies and institutions to bear the environmental costs resulting from practicing various activities, and as a result of the competition between these companies, companies will try to reduce pollution, which makes environmental taxes an effective dynamic role. However, the study of Tan et al., (2022) recommended that developing countries adopt a policy in which environmental taxes are imposed in a manner that is consistent with the social circumstances and economic intentions of those countries. Although environmental tax policy is a powerful and focused tool to decrease environmental pollution, studies are lacking that evaluate these policies and their effectiveness in emerging societies. Karmaker et al. (2021) confirmed that we need more research and additional studies on developing economies regarding the influence of environmental taxes on environmental externalities.

The use of environmental taxes has increased in many countries in recent years, and although energy taxes such as the carbon tax are the most widely used in many countries that apply environmental taxes, there is currently a growing trend to expand the base of environmental taxes to extend to other areas related to the environment. As the use of this tax developed, it went beyond its environmental goal. Some literature has touched on environmental tax reform (He & Jing, 2023), which includes developing the tax system, consequently that part of the taxes on labor income and capital are transferred to taxes on environmental pollutants. However, when designing fiscal policies, focus should be on green fiscal policies such as environmental taxes that aim to reduce pollution and decarbonize, especially in countries rich in oil resources such as Libya (Eyvaz-Zada, 2024). In addition, the study of Rojas-Rueda et al. (2024) concluded that the Libyan government and decision-makers in Libya must follow strict policies to reduce air pollution and maintain a healthy environment for the community. In light of these developments related to environmental taxes, this research seeks to study their various dimensions, as a potential entry point for developing the Libyan tax system, especially since the tax system in Libya has not implemented any of its forms yet. Therefore, this study came to demonstrate the importance of using environmental taxes as an effective economic tool to reduce pollution and direct consumer behavior towards a green economic environmental culture.

There is a lack of information about the possibility of applying environmental taxes in the Libyan environment, as no previous research has endeavored to identify the factors through which environmental tax policy can be enabled. This

study attempts to fill this knowledge gap by presenting a proposal for implementing such policies that achieve more than one goal at the same time: protecting the environment and generating revenues for the government.

2. Theoretical Background:

2.1Environmental taxation:

The main impact of human activities on the environment is climate change, mainly through gas emissions such as the burning of fuels (Driga & Drigas, 2019). The widespread use of fossil fuels results in the emission of carbon dioxide, which causes global warming (Yoro & Daramola, 2020). The scale of natural phenomena associated with the problem of global warming has had significant negative effects on many parts of the planet Earth. These negative effects, which disrupt the normal social and economic activities of humans, also affect the world economy for the same causes (Upadhyay, 2020). Influenced by these catastrophic phenomena, the international community considered it necessary to take the serious measures to reduce these phenomena in various sectors of human activity, as well as in the economic sphere (Nukusheva et al., 2021).

Tax systems in various countries of the world have relied on income, wealth, and spending taxes for centuries, with the advantages and disadvantages of these taxes (Schöb, 1997). However, with the economic and cultural development of humanity, there has recently been a need for the emergence of environmental taxes. To represent a tool for improving the quality of the environment and confronting pollution on the one hand, and then an attractive entrance to raise the efficiency of tax systems instead (Soares, 2011).

The initial reason for the emergence of the idea of environmental taxes is due to the presence of a number of production and consumption activities that generate negative external effects on the environment. It is often difficult to estimate and incorporate it into the costs of these activities. The English economist Arthur Cecil Pigou was the first to draw attention to the problem of negative external effects on the environment in 1920; as a social cost, failure to take it into account is one of the causes of market failure (Pigou, 1932). Pigou claimed that it was not these effects can only be treated through taxes. Thus, environmental taxes primarily aimed to integrate external effects into production costs and force those who caused them to bear their cost by adding an additional tax to the market price. The use of tax policy to protect the environment has an impact on the environmental behavior of institutions and companies. It belongs to the environmental protection tax (Pigou tax), which mainly controls behaviors that negatively affect the environment and encourages behaviors that have positive effects. The government can limit the negative externalities resulting from

companies' environmentally polluting emissions by imposing taxes or fees, thus forcing companies to reduce polluting emissions. Ameer et al. (2024) claimed that by imposing environmental taxes and applying environmental technology, the country can reduce polluting emissions by 28%. In addition, Jabeen et al. (2025) recommended for a future free of polluting emissions and to achieve environmental sustainability, environmental tax policy should be used. Thus, environmental taxes have a significant and beneficial effect on the environment and the country's economy.

2.2Definition of environmental taxes:

Taxes are generally a compulsory financial imposition by the government on individuals or entities, and their primary objective is to collect the revenues necessary for government spending, although they have other objectives. The report of European Environment Agency (EEA, 2005) indicated that there is no comprehensive definition of environmental taxes in the current literature, and therefore it has been difficult to establish a formal definition that is agreed upon, and therefore any tax imposed that concerns environmental rules is considered an environmental tax. Bruvoll (2009) argued that instead of defining a theoretical definition of environmental taxes, any taxes on pollution, transport, energy and resources could be called environmental taxes.

The definition currently generally accepted by the European Commission and the Organization for Economic Cooperation and Development (OECD) is based on the rationale that an environmental tax is defined by the tax base. Environmental taxes are any amounts of money that are compulsorily deducted by the government without providing any benefit in return, imposed on an appropriate tax base (Milne, 2011). In the context of environmental tax reform, the European Environment Agency (EEA) explained that the traditional tax burden is shifted to environmentally harmful actions, such as resource extraction or pollution. Also, the European Union Statistical Framework defines an environmental tax as a tax whose base is a material unit on anything harmful to the environment and which is determined in accordance with the laws regulating it (Milne & Andersen, 2012). In this context, it can be said that the term environmental taxes mention to taxes with an environmental rather than a financial motive.

Chiroleu-Assouline and Fodha (2014) argued that environmental tax revenues could be utilized to decrease distortionary taxes and hence decrease the cost of efficient environmental tax reform. Even if the environmental benefits are difficult to achieve, the desirability of environmental tax reform is increasing. Thus, environmental taxes are currently preferable to ordinary taxes. In addition, environmental taxes are sometimes called Pigou taxes, a tax levied on activities that produce negative environmental impacts through production and

consumption (European Union, 2024). Thus, the cost of imposing an environmental tax on negative environmental impacts is equal to the cost of the damage caused by these emissions. According to Pigou logic, the challenge of the environmental tax rate could also include the tax rate on the damage caused by the production and use of energy.

The tax rules in determining environmental taxes refer to the estimated amount of emissions from the pollutant, and determining this estimated amount of harmful emissions is not easy and is also considered expensive. Therefore, there are many rules on which environmental taxes are imposed. With reference to EU Regulation (EU) No. 125/2022 amending Regulation (EU) No. 691/2011, which defines the main types of environmental taxes (European Union, 2024):

- Energy taxes, this type includes taxes imposed on the production and use of energy. Such as gasoline, diesel, fuel oils, coal, electricity, and natural gas. Also, taxes on biofuels.
- Transport taxes include taxes related to the ownership and use of various means of transport. This tax may be a one-time tax such as the sale and import of means of transport or a recurring tax such as an annual road tax. In some countries, the basis for imposing an environmental tax is the CO2 emissions rate of the vehicle.
- Pollution taxes, this type focuses on polluting emissions to water, air and soil as well as noise and solid waste estimates.
- Resource taxes are imposed on the depletion of natural resources, by extraction or use, such as groundwater, trees and plants.
- Carbon Dioxide Taxes (CO2), this tax focuses on emissions of carbon dioxide and other greenhouse gases.

2.3The polluter-pays principle:

To achieve the goals of environmental policy, the polluter pays principle must be promoted. This generates revenues for the state and is considered compensation for the effects of pollution, while at the same time acting as a deterrent from the beginning to reduce environmental pollution. Environmental taxes aim to significantly reduce the cost of emissions, and those who pay this cost are polluters (Bruvoll, 2009). Dahmani (2024) pointed out that when adopting environmental tax policies, it is essential that these policies are fully consistent with the polluter pays principle.

The OECD was the first to adopt the polluter pays principle, and this principle was first introduced in 1972, this principle provided the theoretical basis for environmental taxation (Tan et al., 2022). To preserve the environment, the polluter essential bear the costs necessary to reduce and prevent pollution

(Nurhayati et al., 2024; Q. Xu et al., 2024). Even under this principle, the polluter has no right to pollute the environment. The polluter pays principle is considered the basis of environmental policy, as it stipulates that whoever causes environmental damage, whether an individual or a company, bears full responsibility for any social cost caused by this environmental damage, with the aim of reducing environmental damage and returning it to the ideal level.

Khan (2015) argued that over the past twenty years, the polluter pays principle has been applied in a number of economic systems through taxes and fees. Theoretically, an environmental tax (Pigou tax) should be set at a level that reflects the cost of environmental damage caused by environmental pollution. Experience has shown that the Pigou tax has not been fully implemented due to inaccuracies in the cost of environmental damage such as greenhouse gas emissions. Sahu and Bagchi (2023) claimed that the environmental tax is considered a reliable reference tool to reduce negative external impacts, but sometimes there is difficulty in identifying the polluter and thus does not achieve an ideal solution for the environment. However, this type of tax must be implemented, but with caution, because the wrong policy leads to adverse results.

As a result, a number of countries have adopted a more pragmatic approach called the Baumol-Oates approach (Baumol & Oates, 1971), it proposes to set environmental standards, and in order to meet these standards, potentially arbitrary charges on pollution emissions, to influence the behaviour of individuals and companies. The results of the Hamlen (1977) study show that fees imposed in the Baumol-Oates approach achieve results on externalities at the lowest cost. However, this approach may have a negative influence on environmental quality policy and investment decision due to the change in these fees to achieve the appropriate standard. Thus, this creates concern for the responsible environmental institution (Horner, 1974).

2.4The economic basis of environmental taxes:

Environmental pollution has negative effects on the development process and the economy in general. It negatively affects agricultural and animal production and workers in polluting factories, which leads to a decrease in labor productivity. Here, the government needs huge sums of money to address the effects of pollution, which burdens the government treasury and negatively affects the economy. Hence, the role of legislation and laws to protect the environment comes, including environmental taxes, which can play an effective role in improving the environment at a low cost to the state (Baumol & Oates, 1971). The environmental tax system encourages the development of environmental technology, reduces carbon pollution, and stimulates economic growth (Karmaker et al., 2021).

2.4.1 Environmental taxes as a tool aimed at achieving environmental policy objectives:

Consequently of the economic growth witnessed by the world and its accompanying harmful effects on the environment, many countries face challenges to decrease pollution and preserve the environment. Y. Xu et al. (2023) and Ghazouani et al. (2021) pointed out that environmental taxes play an effective role in pollution control and environmental protection. The use of environmental tax to reduce environmental pollution problems is considered one of the main pillars of confronting the phenomenon of climate change (Shahzad, 2020). In China, the outcomes of a study conducted by Y. Xu et al. (2023) argued that environmental taxes have an important and effective impact on reducing environmental pollution and promoting sustainable development, and the environmental tax policy can be strengthened in cooperation between governments. The study also indicated that a comprehensive approach to reducing pollution and protecting the environment can be implemented by changing the external costs of pollution into internal costs on the polluter through paying the tax, supporting green innovation and strengthening environmental protection facilities. In addition, study of Wang et al. (2022) conformed that imposing a carbon tax reduces emissions of pollutants and mitigates global warming by 8.6%. The research concludes that to achieve sustainable development and protect the environment from pollution, stringent policies such as green taxes must be followed. And Ding et al. (2019) suggested that adopting environmental policies and environmental taxes in the most polluting economies reduces carbon emissions by 28%. Thus, environmental taxes and their binding laws are effective tools that force companies to produce in less polluting ways, and the revenues from these taxes can be used to achieve sustainable development (Doğan et al., 2022).

On the other hand, in developing economies that suffer from fiscal deficits in their budgets, environmental taxes can be used in addition to reducing pollution to offset this deficit (Halkos & Papageorgiou, 2018). And the developing countries can benefit from the experiences of developed countries in implementing environmental tax policy and achieve the desired results in a faster time frame (Karmaker et al., 2021). Bluffstone (2003) claimed that the imposition of environmental taxes to reduce pollution in developing countries and countries with economies in transition is an effective and significant contribution to reducing environmentally harmful behaviors and thus to environmental protection.

2.4.2 Environmental taxes and the idea of double dividend:

Among the first to address the term double dividend were Pearce (1991) and Oates (1993), who indicated that the main objective of the environmental tax is to keep and improve the environment, while at the same time using its revenues to improve welfare by reducing existing taxes and increasing the gross domestic product. Thus, the trend becomes to impose more environmental taxes and use their revenues to improve the environment. This argument emphasizes the choice of tax policies in which the shift to environmental taxes rather than traditional taxes is effective, and the choice of environmental policies that reduce pollution.

Moreover, Fullerton and Metcalf (1997) explained that we can limit the benefits of environmental taxes on polluting actions are divided into two types, firstly benefit is preserving the environment and secondly benefit is using environmental tax revenues to improve the economic efficiency of the state and reduce other types of taxes. Also, Goulder (1995) and Schöb (2005) suggested that environmental tax revenues can be utilized to decrease distortionary taxes, and thus environmental taxes improve the environment and increase non-environmental welfare at the same time. Although the double dividend hypothesis is a rather weak hypothesis, it is widely accepted among economists, and thus environmental tax reforms are desirable at present (Schöb, 2005).

Although there were many doubts among scholars in the 1990s, during the boom of environmental taxes, about the validity of the double dividend hypothesis of environmental taxes, a number of studies in recent decades have shown the high potential of double dividends even in developing countries (Bento, 2024). Eyvaz-Zada (2024) and İnceiplik and Şimşek (2024) also confirmed that environmental taxes, especially carbon taxes, reduce environmental pollution and achieve climate goals, and can also increase government revenues. Consequently, environmental taxes, through the double return hypothesis, provide an effective mechanism to preserve the environment on the one hand and achieve sustainable development on the other hand, that lead to social and economic progress (Ben Youssef & Dahmani, 2024).

2.4.3 Environmental tax assessment:

In this section, the evaluation of environmental taxes will address some principles in tax evaluation such as revenue abundance, justice and efficiency. For environmental taxes and revenue abundance, the ratio of environmental tax revenues to total tax revenues in the European Union countries ranged on average between 6.71% and 5.02% during the period 2003-2022 (Statista Research Department, 2024). Different countries have achieved higher ratios, in 2020 at 13% in Guyana (Cottrell et al., 2023) and in India 17.470 % in 2018

(CEIC, 2024). These ratios make environmental taxes a potential source of public revenue that can contribute a significant share to these revenues.

Despite doubts about the sustainability of environmental taxes as a source of public revenue for the state, there is currently a growing trend towards implementing environmental taxes (Dahmani, 2024), and possibly this demand can be explained by the success of environmental taxes in reducing the amount of emissions or activities that pollute the environment, which has led to the relative erosion of its tax base, compared to other taxes whose tax base may expand with the shift to environmentally friendly activities. Accordingly, the decrease in its proceeds is a positive indicator that it has achieved one of its main objectives, which is to advance the quality of the environment and curb pollution. Therefore, this positive impact on the environment is also an indication that environmental taxes may not be a reliable alternative to taxes on labor and capital in the long term, leading to the belief that the idea of double returns may be limited to the short term only; as environmental taxes generate a large share of tax revenues. It is worth noting that this result is not inevitable, as the decrease in the volume of environmentally polluting activities is accompanied by growth in the volume of environmentally friendly activities and in innovation and development activities, and thus an increase in the growth of the gross domestic product, which leads to an expansion of the tax base from other aspects, and thus a rise in the total tax revenue.

Regarding the principle of environmental taxes and justice, environmental taxes are widely believed to be unfair taxes that lead to greater income inequality (Kumar & Stauvermann, 2024), as this tax targets goods that consume a large proportion of the income of poor families compared to rich families, which means that poor families bear a higher relative burden than rich families, increasing inequality and injustice in the distribution of income. Therefore, it does not take into account the principle of ability to pay, which gives justification for the unacceptability of environmental taxes by many people.

In fact, the justice of environmental taxes can only be assessed in light of how their proceeds are used. The distribution of costs that affect fairness is a critical component of general acceptance of environmental taxes among the public (Muhammad et al., 2021). The acceptance of environmental taxes, especially carbon taxes, depends on the mechanism of use of revenues (Maestre-Andrés et al., 2021). If environmental taxes are designed as revenue-neutral taxes, and their revenues are used to reduce taxes on capital, this will lead to an improvement in the incomes of capital owners and more inequality in the distribution of income. However, if they are used to reduce taxes on labor such as wages and salaries, in addition to providing cash transfers to low-income households, they will improve the incomes of the poor, and thus achieve more

justice in the distribution of national income. Accordingly, the final impact of environmental taxes varies from one case to another, and depends on the degree of use of mechanisms to recycle the revenues of those taxes.

On the one hand, the principle of environmental taxes and efficiency, the environmental taxes are considered effective tools for achieving environmental sustainability. Basically, generating income is not one of the main objectives of imposing the tax, but rather the goal is to change behavior and reduce pollution (Koval et al., 2022). However, the idea of efficiency addresses the issue of the ability of the tax to achieve the goals for which it was designed, at the lowest possible cost. These goals are protecting the environment and stimulating a healthy economy, while at the same time increasing the state budget (Piciu & Trică, 2012).

3. Environmental taxes and the Libyan tax system:

3.1 The Libyan tax system and the most important challenges:

There are legislations in Libya that regulate the tax system, and a number of these legislations have been issued since 1968. The latest law currently in effect is Law No. 7 of 2010, which divided taxes into direct taxes and indirect taxes (Abodher, 2019). In this law the direct taxes include taxes on income and capital. Income taxes are divided into income of natural persons, taxes on corporate income, and general income taxes. Capital taxes include the tax on vacant land, the tax on residential real estate, and the tax on livestock and poultry. Indirect taxes are divided into consumption taxes and a tax on circulation (stamp), as consumption taxes include customs taxes, production taxes, and entertainment taxes.

The Libyan Audit Bureau report for 2016 indicated that Libya faces problems due to its weak ability to mobilize revenues in an appropriate size to finance public expenditures. Libya suffered from a decline in oil revenues after the 2011 revolution due to political problems and unrest, in addition to the volatility of global oil prices and a decline in oil production (Abodher et al., 2018, 2020). In addition, tax revenues also constitute a small percentage of the state's general revenues. According to the Audit Bureau report, tax revenues represent only less than 1% of the state's total revenues for the fiscal year 2022 (LAB, 2023). Therefore, imposing new taxes, such as environmental taxes, may increase this percentage, which will achieve more revenues for the state to meet its public expenditures. Migliavacca (2004) pointed out that environmental taxes are a powerful tool to increase government revenues while allowing the government to limit polluting behavior.

Although the key objective of environmental taxes is to improve behaviors by reducing environmental pollution, not to generate revenues or enhance profits

for the government. The use of environmental taxes for revenue purposes and to address the shortcomings of the tax system may not achieve the economic returns related to efficiency, equity and growth. This problem may be true in general, but in the Libyan case, environmental taxes may be able to increase the total collection of tax revenues, and at the same time, they may be able to achieve economic gains, by reducing taxes on labor income and capital.

3.2 Environmental pollution in Libya:

In Libya, pollution is one of the largest environmental problems, which has negative effects on the quality of soil, water and air (Generis Global, 2024). In Libya, Law (15 of 2003) concerning the protection and improvement of the environment defined environmental pollution as the occurrence of any condition or circumstance that results in the exposure of human health or the safety of the environment to danger as a result of pollution of the air, sea water, water sources, or soil, or an imbalance of living organisms, including noise, vibrations, and unpleasant odors, and any other pollutants resulting from the activities and work carried out by a natural or legal person. Libya, as other North African countries, is going through a phase of development and industrialization, and its primary reliance on the manufacture of petroleum, natural gas and fossil fuels, in addition to the spread of cement factories, has all contributed effectively to the increase in pollution in the country (Rojas-Rueda et al., 2024). In addition, Libya is an oil producing country and the eighth largest oil reservoir in the world is located there, which has led to an increase in the need for electricity, which ultimately leads to increased pollution and waste generation (Elmnifi et al., 2024).

In addition, according to the Environmental Performance Index 2020, Libya ranks 123 out of 180 countries in the Environmental Quality Index. Also, the per capita share of carbon dioxide emissions in 2015 was estimated at 10.2 tons/capita, with total emissions estimated at 2.4 billion tons in the same year. This average of 10.2 tons is higher than the global average of 7 tons/capita (Alsharef & Hassan, 2024). A study on Libya in 2017 conducted by Nassar et al. (2017a) showed that the total emissions into the air are approximately 61.1 million tons per year, with carbon dioxide emissions accounting for 96.76%, which is considered the largest percentage. In terms of carbon dioxide emissions, Libya ranks 53 out of 225 countries. The outcomes of the study also found that air pollutants are emitted from the electricity industry, which accounts for the largest percentage of 33.9%, followed by the transportation sector at 30.7%, followed by the residential and commercial sector, then the cement industry at 14.2% and 10.9% respectively.

Libya relies mainly on fossil fuels for electricity production, and during electricity generation it produces carbon dioxide, which causes environmental damage in Libya of $51 per ton, three times the value used in the United States (Makhzom et al., 2023). Recently, the results of a study on Libya to assess carbon dioxide pollution emissions indicated that these emissions have not witnessed any decrease over the past two decades, which is an indication that there are no efforts by the government to reduce these emissions that cause global warming. The results of the study also confirmed that the association between economic action and pollution in Libya is a direct relationship. The study concluded that the government should exert more efforts and take serious steps towards reducing carbon emissions (Alkawfi, 2023) .Consequently, the situation in Libya is characterized by a type of excessive emissions that pollute the environment, making it a truly fragile environment.

Libya among the ten most polluted countries in Africa in 2023, ranking seventh in terms of air pollution, and 20th in the world (Adekunle, 2024). This ranking indicates that Libya faces a major challenge in terms of environmental pollution and how to reduce it, as these levels are considered high and the Libyan government must put in place policies to protect the environment effectively. Table 1 shows Libya's ranking among the most polluted African countries according to IQAir:

Table 1. The 10 most polluted countries in Africa:

Country	Pollution	African Rank	Global Rank
Burkina Faso	46.6	1	5
Egypt	42.4	2	9
Democratic Republic of Congo	40.8	3	10
Rwanda	36.8	4	15
Zimbabwe	33.3	5	16
Ghana	33.2	6	17
Libya	30.4	7	20
Gambia	28.5	8	24
Senegal	28.2	9	26
Uganda	27.3	10	28

Source: Adekunle (2024)

3.3Employing environmental taxes in Libya:

Libya, as a developing country, is trying to transform into industry and expand its economy. In the coming periods, it will face an increase in environmental problems, due to the connection between environmental issues and the oil industry and other causes of environmental pollution (Otman et al., 2007). To protect the environment from pollution, several laws were issued in Libya, especially after Libya joined the International Convention for the Prevention of Pollution of Sea Water by Oil issued in London in 1954, amended on April 13, 1962. These laws focused on imposing penalties on polluters as a means to reduce pollution. Among these laws is the issuance of Law No. 8 of 1973 regarding the prevention of pollution of sea water by oil. Health Law No. 106 of 1973 was also issued, the articles of this law focus on protecting public sources of drinking water from pollution or the risk of pollution. The purity of the human environment and its protection from pollution are considered basic components of the safety of society.

The Libyan Law (No. 15 of 2003) on the protection and improvement of the environment is considered one of the important laws that deal with the phenomenon of environmental pollution and attempts to reduce it. One of the objectives of the law that it seeks to achieve is the implementation of environmental control. The environment is a place where humans and all living beings live. It must be protected from pollution, and efforts must be made to find the best ways to measure pollution and work to reduce it, and efforts must be made to prevent the various damages resulting from pollution, improve life, and develop future scientific plans for that. This law aims to achieve sustainable development and benefit from natural resources and work to exploit them optimally. Despite the legal legislation put in place by the Libyan management to protect the environment, environmental violations in Libya are on the rise, posing a threat to Libya's natural resources and biodiversity (Generis Global, 2024).

Nassar et al. (2017b) argued that in Libya, as a result of the increased demand for fossil fuels in the energy sector, pollution from carbon emissions has increased. The solution, from author's point of view, is to impose environmental taxes to reduce pollution problems, as environmental taxes have advantages over other tools, such as the ability to decrease environmental pollution at lesser costs, while at the same time enabling environmental taxes to obtain new revenues that can help in the transition to environmental technology. Yagub et al. (2024) also confirmed that one of the arrangements that can be adopted in Libya as one of the solutions to reduce or limit carbon dioxide emissions and other pollutants is carbon taxes. However, Nassar et al. (2017a) suggested that the amount of pollutant should be estimated by the mass of the pollutant from

the manufactured product or fuel consumption to determine environmental damage and estimate the price of the environmental tax on industrial activities as applied in developed countries. Note that Libya does not have such measurements of pollutants and work should be done in this direction to determine strategies and policies that mitigate pollution in Libya. Iessa et al. (2022) recommended that environmental issues should be dealt with more seriously and policies should be developed and designed by the government and decision makers to effectively reduce pollution.

4. Conclusion:

This research summarizes the important factors behind the emergence of environmental taxes, which included tax legislation, government initiatives, and the challenges of imposing environmental taxes. Therefore, this may indicate the need for more efforts by the government to impose environmental taxes to reduce environmental pollution that may negatively affect sustainable development.

There were shortcomings in the current Libyan legislation regarding reducing pollution and protecting the environment, which negatively affected Libya's position compared to countries of the world, as Libya became ranked twentieth in the world and seventh in Africa in terms of air pollution in 2023, and this matter casts a shadow on the difficulty of addressing the problem of environmental pollution by the government.

There is also weakness in state agencies regarding tracking polluters, whether individuals or institutions, in addition to not seeking to address this phenomenon due to weak legislation and proposing solutions. Therefore, there is a need to develop the current tax system to keep pace with recent international developments to reduce pollution, such as imposing an environmental tax on the polluter, and the experiences of countries that have implemented such a type of tax indicate a positive impact in reducing environmental pollution as well as obtaining a double return as additional revenue for the government.

To impose new legislation in Libya, we recommend working to make environmental protection a significant part of sustainable development and that these legislations include environmental taxes. Environmental taxes should also be adapted to be consistent with the polluter pays principle. Finally, we recommend raising awareness of the significance of environmental taxes and their role in preserving the environment and reducing pollution, with the government adopting an environmental tax as a step towards deterring polluters from continuing this wrong behavior. The thoughtful phased application when adopting environmental taxes, similar to developed countries, will have an effective impact on polluting behavior. This study proposes conducting a

practical study on environmental taxes as a tool to reduce pollution and obtaining the opinions of non-governmental organizations and stakeholders.

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الضرائب البيئية كمدخل معاصر لتطوير النظام الضريبي الليبي

د. فرج مصطفى أبو ظهير

قسم المحاسبة، كلية الاقتصاد والتجارة، الجامعة الأسمرية الإسلامية، زليتن، ليبيا

f.abuthair@asmarya.edu.ly

الملخص:

في ظل الاهتمام المتزايد بالقضايا البيئية في العقود الأخيرة، برزت الضرائب البيئية كآلية للحد من التلوث البيئي وحماية البيئة. تسلط هذه الورقة الضوء على مفهوم الضرائب البيئية وتستعرض أهم الدوافع وراء تبنيها. تعتبر الضرائب البيئية أداة مهمة يمكن أن تساعد في الحد من التأثيرات البيئية السلبية وتحسين الأداء البيئي، فضلاً عن تحقيق الاستدامة البيئية. يُظهر استعراض الأدبيات السابقة أن معظم البلدان التي تطبق الضرائب البيئية في نظامها الضريبي هي بلدان متقدمة، بينما في البلدان النامية، وخاصة ليبيا، لا تزال الضرائب البيئية غير مطبقة. في الواقع، لا تزال قضية الضرائب البيئية في مراحلها المبكرة في البلدان النامية، وخاصة في ليبيا. تساهم هذه الورقة في أدبيات الضرائب البيئية من خلال توضيح مدى إمكانية تطبيق هذا النوع من الضرائب في ليبيا كدولة نامية، وإمكانية استخدام الضرائب البيئية لتطوير النظام الضريبي الليبي. يمكن أن يوفر إصلاح الضرائب البيئية عائدًا مزدوجًا في شكل نظام ضريبي؛ أموال أقل تشويهًا بالإضافة إلى بيئة أقل تلوثًا. لذلك، توفر هذه الورقة أساسًا نظريًا مهمًا لتحسين تصميم السياسة الضريبية والحد من التلوث البيئي، وللمزيد من البحث العملي حول الضرائب البيئية في المستقبل. ونقترح إجراء دراسة عملية للحصول على آراء المنظمات غير الحكومية وأصحاب المصلحة.

الكلمات المفتاحية: الضرائب البيئية، التلوث، العائد المزدوج، ليبيا.