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**PLANNING AND IMPLEMENTATION OF ENVIRONMENTAL TAXES (PIGOVIAN
TAXES)**

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ABSTRACT

Green taxes (environmental), being one of the main aspects of sustainable development in the countries is considered an effective policy in controlling environmental factors by means of Economic tools. By applying laws, conducting researches and building culture, new bases are developed, the progress is made and the desired result are achieved without making hasty decisions. Given that one of the aspects of sustainable development is to consider environmental issues and to preserve the environment, environmental tax as an economic tool, provides the government with the optimal allocation of resources. Theoretically, adopting an efficient stance, the Pigouvian taxes are more desired; however, in action indirect environmental taxes are widely imposed.

Keywords: taxes, environmental, Pigouvian tax, economic

1. INTRODUCTION

The main reason for pursuing economic development plans in any country is to increase the standard level and wellbeing of the society; yet almost all economic activities are associated with some damages to the environment, which negatively impacts the wellbeing of the society. Meanwhile, the environment provides a wide range of

valuable economic functions and services. Such as; providing renewable and nonrenewable resources, providing natural products including natural landscapes and recreational facilities, disposing of environmental waste created by economic activities. However, if the property rights are not well defined, the generation of pollution

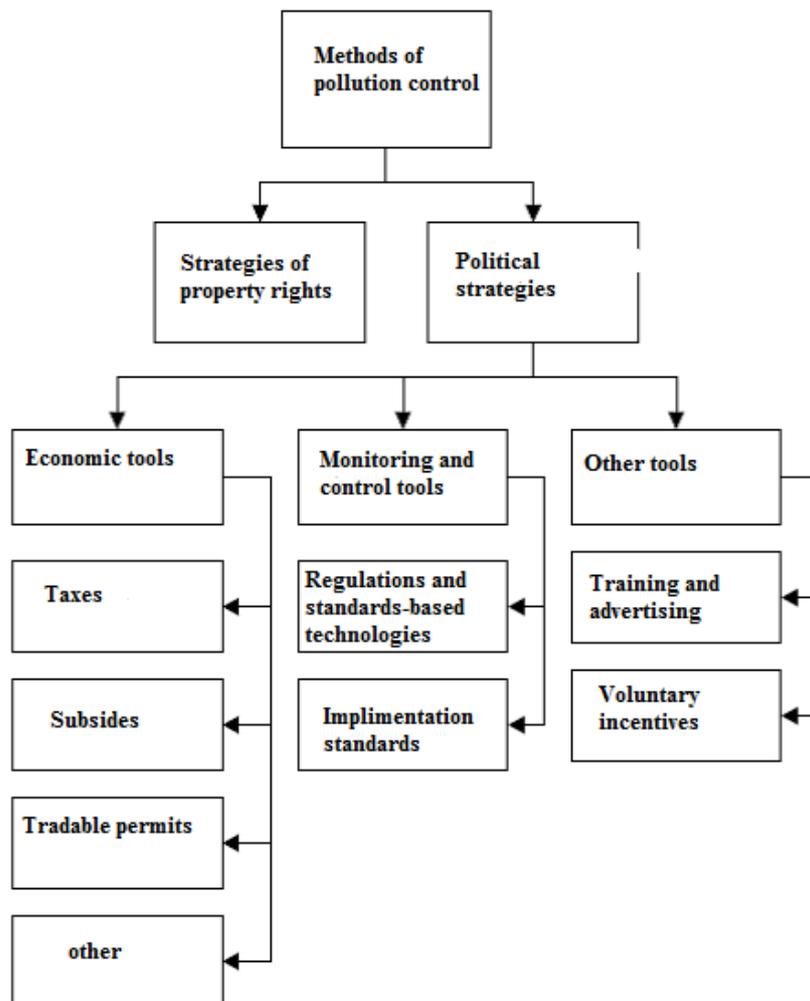
when conducting economic activities will be an externality and affect negatively the wellbeing of the society. Therefore, it is necessary for the government to formulate appropriate environmental policies to internalize the negative effects of pollution. To reduce the environmental side effects and control the pollution, the government suggests different methods, such as; direct environmental tax (Pigovian tax), and indirect environmental taxes and environmental laws (Nellore and McMoRan, 2003). In direct environmental taxes, tax affects the polluter's interests. In this framework, the polluter firm reduces production to get reduction in its tax, consequently leading to a reduction in social costs caused by pollution. Indirect taxes being another type of environmental taxes impose tax on product organizations or consumption products that damage the environment, instead of charging direct taxes on pollution units. By reducing productions and maintenances, improving technologies, direct taxes control the pollution; however, when comparing with the Pigovian taxes, they cost more. Direct and indirect taxes are both based on price systems rather than the implementation of control and command policies. Another way to control the pollution externality costs is to impose statutory

laws. This type of environmental policies determine some acceptable standards regarding the level of environmental pollutants emission. Violating these standards, Economic pollutants units should either stop production or are faced with heavy fines. Although the environment economics is nowadays known as one of the youngest sciences in the world, in recent years it demonstrated considerable improvements and created efficient policies and markets to control and manage the environmental problems. Perhaps one of the reasons for this considerable growth is the high rate of pollutant emission as well as the societies' attention to environmental issues. However, it's not like this in Iran. On one hand, environment economics, methods and environmental economic managements are still young, on the other hand, the society does not pay enough attention to environmental issues. The only common aspect of these circumstances is the high rate of pollutant emission caused by economic activities. Nowadays, the only environment management and pollutant emission policy is that of standards and fines. Unfortunately due to the costly development, implementation and monitoring of standards, the policies are not fully implemented. The plan of imposing fines is also a long and costly process.

Perhaps that's the reason why environmental problems of the country are not solved. Considering the above conditions, it seems that using tools and implementing new economic policies are necessary for managing the environment in a more efficient way. Environmental tax is one of these policies and economic plans. Taxes are not only one of the main revenues of the government, but also are ways through which the governors' policies are controlled and implemented. After the importance of the

environment was realized and international attention was paid to the environmental problems, academic studies conducted on the ways of preserving and controlling the environment as well as the ways of preventing it from deterioration. Controlling environmental pollutions and preserving the environment was one of the most important subjects in the economic literature that is remarkably grown.

Ways to control pollution are mentioned below:



As it is observed, economic tools used in pollution control are divided into three subsections among which 'taxes' is one of the most widely used methods. Environmental taxes were created since Pigou in 1920 introduced taxes on foreign products (Darvishi, 2011).

2. Theoretical Foundations

Morris et.al (1999) conducted a research in Hungary and adopting a cost-benefit analysis approach showed that the policies on environmental tax reformation include appropriate pollution taxes and rotational costs, in fact, these policies offer a benefit to cost ratio which is so much higher than one. Although this ratio may be reduced in the presence of restrictive environment taxes. Caffet (2005) considered the mutual benefit from a different angle. He stated that, by enhancing environmental health and generating externalities in markets, raising environmental taxes (so called environmental tax reformation) might be effective in economics generally. So higher environmental taxes result in the creation of a healthier environment; in addition, when taxes are higher, the efficiency of people increases, causing more labor supply and more efficient economic in the society. Parry and Bento (2000) showed that if some taxes such as house ownership or health care

services are included in the model, the tax on these services are reduced and workers are able to purchase a wider consumer goods. Therefore, the consumptions are demonstrated in a more realistic way and the total welfare increases. Barkera et al. (1993) claim that those firms which raise their environmental standards and generate cleaner technologies, don't pay environmental taxes and may take advantage of their conditions. They also may improve their competitive conditions towards the firms that don't pay environmental taxes. In other words, this advantage confirms the existence of a process that is particularly suitable for the environment.

1-2. Green taxes

Nowadays the environment being one of the pillars of sustainable development and development of other economic and social sectors is dependent on its stability and proper functioning. For this reason, in recent years and especially from 1990s and after the leadership conference in 1992 in Rio de Janeiro, Brazil, the subject of preserving the environment has been addressed internationally; thus regional and international agreements are signed in international community to preserve the environment. On one hand, Environmental developments at the international level and

development processes of environmental degradation in the country on the other hand, has caused the issue of environmental protection to be the focus of politicians and decision makers. That's why, over the past years, the development of environmental policies and programs have evolved and the status of the environment in the country in the planning system is improved as well as attention to the various environmental considerations. Hence, over the years, many attempts have been succeeded in preserving the environment but it requires persistence to accomplish goals. Green taxes (environmental) are one of the most important bases of taxing. This kind of taxing being a monetary policy tool has different consequences. Green taxes can be divided into 2 groups:

- **Direct taxes**
- **Indirect environmental taxes**

In The Future Outlook of the Islamic Republic of Iran, some items such as health, welfare, food security, social security, equal opportunities, income distribution, poverty and corruption and enjoying a favorable environment have been emphasized on. Therefore, the use of green taxes will help the government in meeting the objectives of this document.

- Environmental direct taxes (Pigouvian taxes)

These taxes are imposed based on the ratio of pollutant emissions per unit or Environmental degradation. The tax rate equals the social final cost at the socially efficient level of emissions. Socially efficient level of emissions occurs when the final benefits of the elimination of pollutions equaled the final social cost of pollution emissions. Generally, Pigouvian taxes raise the price of pollution by raising social costs causing the polluters face with their personal and social costs of their actions. This type of tax is only imposed on a limited scale and is used mainly in Europe (Shemirani and Shabani, 2008).

- **Indirect environmental taxes**

Using incentive pricing mechanism, the indirect taxes allows producers and consumers to change their behavior of pollution disposal and emissions. In this type of taxing, the tax is imposed on industrial or consumer goods that the use of them damages the environment rather than getting taxes based on the division to per unit pollution. This type of taxing is widely used in industrialized countries but developing countries don't use this tool. Some indirect environmental examples are; specific energy taxes that are run by some European

countries, adverse effects of chemical fertilizers and taxes on beverage containers. (Haj Mohammadi, 2009).

2-2- The effects of environmental tax on emissions

According to the financial loads of green taxes for businesses and individuals, and also because of the Originality of imposing taxes and their implementations, the process is assumed to be resisted. On the other hand all sectors of the economy that somehow use aids, exemptions, and government subsidies and in other words are dependent on government support would react this new method of taxing. Of course a lot of resistance may be related to non-economic reasons and, in practice, social, cultural and management issues. Also, it is not possible to estimate accurately the cost of pollution and the process is not well recognized. The planning and implementation of green taxes differs in countries.

An overview of green tax reform in OECD countries

In Austria, a waste tax had been implemented in 1989, and an energy tax on gas and electricity was introduced in 1996. The tax rate on electricity was increased in mid-2000. In 1993, Belgium introduced a new tax on some energy products which amounted broadly to a tax on the private use of energy.

Denmark introduced a CO₂ tax on fuels in 1992 and has been engaging in a general reform of its tax system with a continuing evolution of energy-related taxes planned until 2002. The main objectives of the reform are: the reduction of marginal tax rates in all income brackets; the elimination of a series of loopholes in the tax law; and a gradual transfer of tax revenue from income and labor to pollution and scarce environmental resources. However many of these taxes have numerous exemptions and a complicated structure that may reduce their environmental effectiveness.

Finland was the first country to introduce taxes specifically targeting CO₂

Emissions A mostly uniform carbon tax on fossil fuels (albeit with exemptions e.g. for fuels used as reduction agents in metallurgical processes) was introduced in 1990.

In France, a major restructuring of environmentally related taxes and charges was initiated in 1999. This included a government proposal to extend the tax générale sur les activités polluantes (“general tax on polluting activities”) to fossil fuels and electricity.

Germany implemented an ecological tax reform in April 1999. The main goals of the program are to generate incentives for

energy savings and accelerate industrial change, to fund renewable energy programmers, and to increase employment by reducing the burden of labor taxation. The German reforms include phased-in rate rises, for both mineral oils and electricity taxation.

In 1998, Italy adopted a number of environmentally related taxes, including a phased-in CO₂ tax on mineral fuels.

The Netherlands introduced a general fuel tax in 1988 and a number of other environmentally related taxes, for example on waste, groundwater, and a new regulatory energy tax in 1995 and 1996.

Sweden introduced a major tax reform in 1991 in a strict revenue neutral context.

In the UK, a landfill tax came into force in 1996, with revenues allocated to reductions in social security contributions, and a “climate change levy”, a tax on industry and business use of energy, introduced in April 2001. A tax on virgin sand, gravel and rock was planned for 2002.

Norway followed with a CO₂ tax on mineral oils in 1991.

The Swiss electorate rejected two proposals for a green tax reform in a referendum held in September 2000: 1) a tax on all non-renewable energy, the revenues of which would have been used to lower social contributions. 2) a small levy on non-

renewable energies earmarked for promoting renewable energy sources and enhancing energy efficiency.

Reference: OECD

3- Planning and implementation of environmental Pigou taxes

3-1. the planning

Since there is often a wide scale for social costs, determining the final cost remains difficult to assess.

For example, to estimate the social costs of a pollutant, we might collect some information regarding the effects of pollution on human health as well as the formation of human habits, natural parks and recreational facilities. If the effect of pollution on these factors varies spatially and temporally, evaluating the problem will become more complex. Planning indirect environmental taxes are faced with another problem. To determine the tax rate based on the desired amount we need to be aware of the flexibility of malicious activities towards taxing and the flexibility of pollution towards malicious activities.

3-2. implementation

The measurement and monitoring of physical pollution committees might be difficult, theoretically and practically in the implementation of the Pigou taxes. For example, measuring the pollution from a

source like a factory chimney may be easier than the execution of this tax on multiple pollution sources (such as vehicle exhaust). If the spatiotemporal aspects of environmental issues are addressed by taxes, more administrative problems, will arise, because it is difficult to measure the amount of pollution in the geographical areas. For example, if an efficient environmental tax is set for pollutant emissions of vehicles, the tax agency will have to adjust the levels for vehicle emissions and the levels of emissions in urban and rural areas to determine the basis on which taxes apply. In general, if the environmental indirect taxes are imposed, there wouldn't be implementation problems any more. Because the tax is calculated based on the manufacturing and consumer goods' prices. So we can claim that although Pigou tax planning is difficult, but its implementation is much easier. (Moharamnejad, 2006).

3-3-Economic and structural conditions

Structural and economic conditions can limit the efficiency of environmental taxes in any country and this would be considered a major obstacle to impose such taxes.

3-3-1. stable macroeconomics

If macroeconomics is instable, Pigou tax introduction will be difficult. For example, since the Pigou tax has a certain rate; high

inflation rates or efficient variables limit these taxes. Inflation diminishes the real value of tax rates that are in fact a reflection of the social final costs.

3-3-2- state-owned companies

Since state-owned enterprises are likely to respond to price signals generated by environmental taxes. Provided that these companies play an important role, the indirect environmental taxes are no more efficient. This problem mostly exists in developing countries in which the major polluters of the environment are state owned (such as heavy industry, energy sector and other related industries).

3-3-3. Lack of market efficiency

When replacing environmental taxable products is not possible due to lack of market efficiency, environmental damage may increase severely by tax introduction. Imposing efficient taxes like Pigou may solve an environmental problem but may create environmental damages in different ways due to changing relative prices. Due to the lack of market efficiency and relative increase in fuel, indirect environmental taxes on petroleum-based fuels may expand the use of fuel wood fuels and worsen the situation by the destruction of forests.

3-4. CONCLUSION

The importance role of taxation in achieving sustainable growth and economic stability, employment, reduction of inflation, the stability of the general price level as well as being the most important source of government revenue of the government after oil is so obvious for economic and political experts. Macro projects in the field of taxation reflects its importance in the country's economics. Achieving coverage of 85% of the current cost of the government is one of the goals of the in the 20-year outlook of the state. Regarding other government and organization policies such as; increasing public satisfaction (taxpayer) is a one of the rational strategies of tax bases extending organizations instead of increasing the level of taxes. In this regard, using the economic tools may play a key role in increasing market efficiency and allocating optimal resources to achieve the maximum social goals. Perhaps, at first the existence of new bases are justified by the purpose of revenue making for the government; however, considering its effects on the orientations suggests a goal beyond the revenue and the legislative considerations. For instance, taxes on environmental pollutants are one of the new tax bases that apart from the income effects, is so important in allocating taxes which is now performed in many countries of

the world. Green taxes (environmental), being one of the pillars of sustainable development in the countries, are some effective policies in environmental control by economic tools. By applying laws, conducting researches and building culture, new bases are developed, the progress is made and the desired result are achieved without making hasty decisions. Given that one of the aspects of sustainable development is to consider environmental issues and to preserve the environment, environmental tax as an economic tool, provides the government with the optimal allocation of resources. Theoretically, adopting an efficient stance, the Pigouvian taxes are more desired; however, in action indirect environmental taxes are widely imposed.

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