OECONOMIA
COPERNICANA

VOLUME 13 ISSUE 3 2022

p-ISSN 2083-1277, e-ISSN 2353-1827

Received: 27.06.2022; Revised: 22.07.2022, Accepted: 28.08.2022, Published Online: 30.09.2022

DOI: 04.36294/oeco.584815

# THE EFFECT OF THE SUSTAINABLE DEVELOPMENT EXPENDITURES ON THE ENVIRONMENTAL PERFORMANCE IN THE GOVERNMENT OF JORDAN

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**Abstract**

The current paper examines the significance of sustainable development, i.e. the environmental expenditures' role in the public departments and ministries in Jordan, centering on environment-based public departments and ministries. The paper gives insight into the relationship between environmental expenditures allocated allocates to public departments and ministries by the Jordanian government and their effect on the general environmental performance. Using a mixed approach enhances the results' quality. To study the budgets of 22 environment-based public departments and ministries, the quantitative approach is used. With the use of time series from 2006 to 2015, the study is carried out. The qualitative approach is applied to raise environment-based subject matters unaddressed in the quantitative study and comprehend the respondents' perception of the Jordanian public departments and ministries on the items and factors incorporated into the budgets of public departments and ministries affecting their environmental performance. The findings demonstrate that environmental

spending and environmental performance in Jordan share a significant relationship. The findings provide novel and applicable implications for the sustainability development thinkers and specialists, showing the significant impact of environmental expenditures in public departments and ministries and their relationship to the Jordanian government's environmental performance.

*Keywords:* Environmental performance, expenditures, sustainable development, public sector, Jordan

## 1. Introduction

Environmental issues have become one of the focal points of discussion among countries all over the world (Fulekar et al., 2014; Kapp, 2018; World Health Organization, 2018; Messerli et al., 2019); as the world lives on the edge of constant emergency due to increasing environmental issues such as global warming, biodiversity deterioration, and the abuse of natural resources (Fereidoun et al., 2007; Watts, 2019). As a result of this, most countries in the world have sought to reduce the effects of pollution by imposing environmental laws and sustainable development plans for the protection of the environment in the future (Bharucha 2005; Latu, 2009). Consequently, great attention is paid to concentrating on international organizations and shareholders from the entire public and private sectors. For the government sector, few research and studies have addressed the role of the public sector's performance in environmental protection and sustainable development whereas most studies relating to the environmental performance of countries are drawn from international bodies such as the UN and OECD (OECD, 2004; Chai, 2009). Public expenditure management is an important aspect of a country's environmental policy. The current context of the global economy also challenges governments facing budget pressures and excessive debts to find solutions to achieve public policy objectives while trying to make effective use of limited resources. This requires efficient actions in the public sector on individual components. The logic of this approach is in line with what the literature recognizes as a convex relationship between public expenditure and benefits (Masca, 2014; Shahwan & Altrad, 2021).

The patterns of government have greatly changed in developing countries in the past few decades (Fan, Yu, & Saurkar, 2008). Consequently, interest to monitor the content and levels of the government expenditures to estimate the factors causing the shift in trends over time has risen as well. It has become even more important to analyze the relative contribution of various miscellaneous expenditures as it will aid in providing significant information for more efficient targeting.

Governments and companies have become increasingly accountable for their performance in a range of sustainability factors such as pollution control and natural resource management along with human resources and economic challenges (Roy & Goll, 2014). Economic theory suggests that improvement in environmental performance continues as countries develop. Esty and Porter (2005) noted that countries should improve their investments in environmental aspects and control of environmental contaminants. Additionally, Jahn (1998) indicated that the developed countries with high economic growth can strongly combat and deal with environmental problems because they have huge budgets and financial resources. Gallego et al., (2014) explained that the rich countries may be able to invest money to improve their environment in contrast to developing countries and poorer countries. Therefore, the basic concept of this theory is to identify tools that will be effective in reducing

environmental degradation in developing countries. The concept of economic theory is consistent with two main elements: costs and benefits. Turner, Pearce, and Bateman, (1994) pointed out that the main objective of economic theory is to achieve efficiency through the effective investment of financial resources to achieve the best outcomes which can only be achieved through active participation with stakeholders. The development of the stakeholder theory accompanied the advent of financial and environmental issues and was seen as an essential tenet to initiate the country's economy by coordinating governments and their political instruments on the monetary and natural strategy. Governments established laws and regulations to protect the environment which are then applied to the stakeholders. This allowed the government to have nature administration power. Whether it is the government or different organizations, it is mandatory to possess the ability to realize the stakeholders' needs and feedback (UNEP, 2001; Dodds, 2015). Following that perspective, the government needs to effectively manage its finances to cover its expenditures to achieve the wishes of the stakeholders through minimizing costs and reducing risk.

## 2. Prior Literature

Environmental protection is widely regarded as public goodness and the key responsibility of the government. The environmental condition has been and is still the subject of many scientific studies due to the fear of scientists and the increasing understanding by individuals and governments of the damage caused by environmental pollution, especially at this stage of the spread of the COVID-19 pandemic, causing the collapse of most of the health and economic sectors in the countries of the world.

Many studies have discussed the impact of the government's plans and measures to preserve the environment and the growth of the economy in the long term (Aschauer, 1989; Barro, 1990; Tanzi & Zee, 1997). Other studies have looked forward to identifying and examining the links between the state of the environment and other economic indicators (Condrea, & Bostan, 2008; Bostan, Burciu, & Condrea, 2010) to find appropriate solutions to confront the process of environmental degradation and amend environmental policies (Oueslati, 2002; Fischer, & Heutel, 2013; López, & Palacios, 2014)

Moreover, there are numerous pieces of literature discussing the public sector of expenditures by correlating government expenditures with socio-environmental and economic indicators such as education enrolment ratio, gas emission ratios, and infant mortality ratio. Tanzi & Schuknecht (1997) indicate a comparison of the economic performance in their analysis such as growth rates, gross fixed capital formation, inflation, unemployment, and debt, and social performance such as life expectancy, infant mortality, education, and income distribution for 17 small, medium and large OECD countries. It is found that there is an upper limit to the efficient provision of vices and benefits by government and that relatively smaller government is more effective at achieving standards for less cost than larger governments. Moreover, it is observed that "There is no evidence that countries with big governments have outperformed the countries with medium and small-sized governments" (Tanzi & Schuknecht, 1997.p:167). Gupta and Verhoeven (2001) assess the efficiency of government expenditure in the case of 37 African countries from 1984 to 1995. Their main findings stress that the spending of these countries on education and health is inefficient on average. The study shows that the relationship between efficiency scores and public expenditure is negative, implying that higher educational

achievement and health output require efficiency improvement more than increased budgetary allocations. Afonso and Aubyn (2005) compare the performances of 24 OECD countries in education and find no significant relationship between public-to-total education expenditure and efficiency. The authors also argue that "This is probably because most spending in this level of education is essentially public and high for most countries" (p.23). Besides, OECD (2007) shows that the institutional settings such as aging populations, increasing health care and pension costs add to budgetary pressures influencing the efficiency of spending.

The efficiency of spending is an important factor in improving the performance of the public and private sectors. The target of the private sector is to increase profits through the efficiency of spending such as return on profitability (Kumar, 2008; Keramidou et al., 2013) and working capital (Mehmet & Eda, 2009). However, studies in the public sector have looked at the efficiency of spending by examining the impact of spending on education each year, with the success rate of students (Verstegen & King, 1998) and health care expenditure and annual mortality growth (Nixon, & Ulmann, 2006; Kim & Lane, 2013).

As revealed by Alexiou (2009), public spending is a key mechanism to promote growth and resolve social and economic issues such as social cohesion, poverty reduction, social conflicts, and environmental pollution to create a stable environment. The environmental issues in Jordan have become one of the most critical challenges faced by decision-makers in the government. Stone (2004) has showed that an effective institutional framework is what creates good environmental strategies to operate more efficiently. Additionally, the budget deficit and accumulated debt are one of the reasons for increasing the importance of the financial efficiency of expenditure in Jordan. However, Dosi (1982) explains that several reasons leading to the imbalance in the protection of the environment are the lack of financial resources, poor management, and the absence of an appropriate framework for the government. Additionally, Ercolano and Romano (2018) review the models of environmental expenditures at the European level by looking at the composition of public expenditure for environmental protection. They found that the results reject the existence of a homogeneous model of expenditure for environmental protection at the European level. Furthermore, a higher level of environmental performance seems to be positively correlated with the public expenditures in the environmental domain and partially with the different components of the expenditure. Through the above, the majority of the empirical studies have found significant evidence of the available relationship between government expenditures and performance. Therefore, a relationship is predicted between government expenditures and the level of environmental performance. Importantly, this is consistent with the economic theory. Therefore, the following hypothesis is tested:

Hypothesis: Environmental expenditure and environmental performance share a significant relationship.

## 3. Methods

Using annual budgets, public departments and ministries generally disclose their environmental allocations. These environmental financial allocations are available in the public departments and ministries' annual budgets having a direct or indirect association with the environment. Therefore, data from public departments and ministries' annual budgets are collated to observe the information

relating to the environmental expenditures and allocations. Consequently, the period extending from 2006 to 2015 is selected thanks to the efforts of the Jordanian officials to issue the general environment act, laying the first stone to create the Ministry of Environment. Additionally, qualitative and quantitative methods have been used to investigate data to make amends for weaknesses in the related literature. Likewise, the mixed-methods assist in comprehending the complex data and deliver a thorough analysis in this research paper (Creswell et al, 2003; Bryman, 2006). The evaluation of the significance of the environmental expenditures and allocations and their association to environmental performance in the public departments and ministries are required to compose, analyze, and compare the relevant quantitative data. Regarding the qualitative approach, managers in the Jordanian public departments and ministries are selected to conduct semi-structured interviews. To achieve the aims of the study, it is evident that the face-to-face method is the most convenient method among the entire methods. The said method includes a question-based list properly processed so that discussion of several issues is accurately explained. Then, this approach is used to analyze the content by studying each case independently (Yin, 2003; Kohlbacher, 2006).

**3.1 Samples**

The study sample adopted consists of the public departments and ministries associated with the context of the environment. Jordan includes 22 pertinent public departments and ministries, signifying 18 percent of the Jordanian public departments and ministries. The whole data is collated from 12 departments and 10 ministries of the government of Jordan. The annual environmental expenditures of the said departments and ministries between 2006 and 2015 are suitably analyzed. The starting year has been decided to be 2006 because of the Environmental Protection Law issued together with the creation of the Ministry of Environment. What's more, Jordan has witnessed the issuance of the nationwide plan for environmental protection in 2006. Using a mixed approach enhances the current paper results' quality. The adoption of the statistical analysis program EViews 7 helps in employing a quantitative approach to assess the association between environmental expenditures in the public departments and ministries' budgets and government environmental performance.

Additionally, in the course of interviews with the managers in the Jordanian public departments and ministries, qualitative data is collated. Given the panel data method analysis, the following regression equation can be used:

$$EP = \beta 0 + \beta 1AIRit1 + \beta 2\ DEATHSit2 + \beta 3\ WASTEit3 + \beta 4AGRICUlit4 + \beta 5WATERit5 + \beta 6ENERGYit6 + \beta 7BIODit7 + \varepsilon \quad (1)$$

Where

EP =Environmental performance

AIR QUALITY = Annual air quality growth rate

DEATHS = Child mortality growth rate

WASTE = Growth rate of wastewater treatment

AGRICUL = Growth rate of agricultural contribution in GDP

WATER = Growth rate of available water quantities per year

ENERGY = Annual renewable energy growth rate

BIOD = Growth rate of annual cultivated area of total land
ε = Error Term.

The current paper uses the environmental performance (EP) as a dependent variable symbolized by several performance indicators, namely: "AIR QUALITY, DEATHS, WASTE, AGRICUL, WATER ENERGY, & BIO". However, this paper uses the Total annual environmental expenditures and allocations (EE) as the independent variable. All environmental expenditures for the seven sectors identified in this study have been measured through the general budgets issued by the General Budget Department. Environmental expenditures are measured as a percentage of GDP by collecting environmental expenditures for all Jordanian public departments and ministries and divided by the Jordanian dinar GDP.
The total annual environmental expenditures and allocations (EE) are used by the previous researchers to justify the results of their studies (Nixon, & Ulmann, 2006; Kim & Lane, 2013; Masca, 2014; Ercolano & Romano, 2018; Alqotaish & Qatawneh,2017). Since the relevance and significance between environmental expenditures and environmental performance are comprehended, this enhances the sustainability development level in the public sector amongst government departments and ministries as well.

## 4. Results & Discussion

Table (1) shows the results related to the 40 observations for the 10 years between 2006 and 2015 for the 22 public departments and ministries in Jordan. The dependent variable mean of the environmental performance (EP) is "0.08 represented by air quality, death rate, treated water, agriculture GDP, water value, energy rate and biodiversity performance, i.e. -0.06, -0.10,0.43, 0.11, -0.05, 0.33 and -0.32, respectively". Besides, the environmental expenditure (EE) means is of 7.22. Regarding the current paper, "The environmental performance's standard deviation is 0.105 with a standard deviation for air quality, death rate, treated water, agriculture GDP, water value, and energy rate and biodiversity performance, being 0.046, 0.134, 0.220, 0.143, 0.136, 0.229 and 0.097, respectively". However, the environmental expenditure represented by a percentage of the gross domestic product includes a 1.332 standard deviation.

Table 1

*The Descriptive Analysis Results*

| Variable | Mean | Median | Std. Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| **Air quality** | -0.069 | 0.065- | 0.046 | -0.140 | 0.000 |
| **Infant mortality** | 0.106- | 0.060- | 0.134 | 0.350- | 0.000 |
| **Treated water** | 0.430 | 0.420 | 0.220 | 0.000 | 0.830 |
| **Agriculture GDP** | 0.111 | 0.100 | 0.143 | 0.080- | 0.420 |
| **water available** | 0.050- | 0.075- | 0.136 | 0.240- | 0.250 |

| | | | | | |
|---|---|---|---|---|---|
| **Renewable energy** | 0.337 | 0.330 | 0.229 | 0.000 | 0.820 |
| **Biodiversity** | 0.320- | 0.015- | 0.097 | 0.260- | 0.090 |
| **All performance** | 0.089 | 0.065 | 0.105 | 0.040- | 0.320 |
| **Environmental expenditure** | 7.22 | 7.000 | 1.332 | 4.800 | 10.320 |

**Notes:** All Performance is all environment performance indexes representing the dependent variable. Air quality is the annual rate of air quality, Infant mortality, is the deaths of infants ratio, Treated water is the quantity of treated water annually, Agriculture GDP is the contribution of the agricultural sector of GDP, Water available is the amount of water available annually, Renewable energy is the energy quantities of renewable energy annually, Biodiversity performance is the total cultivated area annually, Environmental expenditure, represented by the ratio of environmental expenditures to GDP.

**4.1 Relationship of the government environmental expenditure & environmental performance**

The current piece of the paper aims to decide on the availability of the relationship between the expenditures paid by the government towards the environment and the environmental performance in Jordan. The results revealed in Table (2) show that the environmental performance and the environmental expenditure in Jordan share "A significant relationship (B = 0.035, T = 3.29, P = 0.002). Therefore, the hypothesis is accepted. The said result signposts that the spending plans set by the government towards the environment improve environmental performance in the Jordanian public departments and ministries.

Table 2

*The Environmental Expenditure & Environmental Performance Results*

| Hypothesis | Coefficient | T-Statistic | Prob. | Remark |
|---|---|---|---|---|
| **H1: Environmental Expenditure → Environment Performance** | **0.035** | **3.290** | **0.002** | **Supported** |

**5. Conclusion**

In a nutshell, this paper's results demonstrate that environmental expenditure plays an important role in environmental protection within environmental management through managing the environmental protection activities in Jordan. Additionally, this also indicates that Jordanian environmental management uses financial and administrative measures to analyze interactions in environmental indicators and expenditures. This result is consistent with existing literature, confirming the importance of environmental expenditure to enhance environmental performance and the effectiveness of the government's use of public funds (OECD, 2007; López, Galinato, & Islam, 2011). Djurović-Todorović & Djordjević, (2009) point out that public sector management shall be developed and the basic expertise and literature on the spending approach should be used, along with stressing that there is a lack of parliamentary expertise responsible for monitoring the performance of expenditure and the

functions of effective control in the country. On the other hand, Wadongo and Abdel-Kader (2011) mention that there should be assessment and accountability of ministers to explain the differences between planned and actual performance. This result also agrees with the stakeholder theory, focusing on the role of public finance in the context of sustainable development, which is to maintain the sustainability of public finances and ensure the growth of the country's economic development by meeting social and environmental needs through enhanced environmental expenditure.

Importantly, previous studies and stakeholder theory mention that improving environmental performance requires providing the government with information that facilitates the allocation of funds toward high-performing programs. Furthermore, this affirms the stakeholder theory as managing expenditures and resources effectively by the government leads to good ethical behavior in which stakeholders' interests are respected. As revealed by the economic theory, the government seeks public finance to stimulate the economy by preserving the environment and increasing social welfare (Sinevičienė, 2015). Moreover, legitimacy theory encourages governments to take care of the environment, and act in the best interest considering societal norms and values. This result aligns with the results reported by (Halkos & Paizanos, 2013; Maleka et al., 2017; Gholipour & Farzanegan, 2018). The level of government environmental expenditure represented by the ratio of environmental expenditures to GDP is closely linked to the environmental performance of countries. To put it another way, the higher the government's environmental expenditure, the higher the environmental performance.

Regarding the answers of the respondents, the respondents emphasize that the involvement of stakeholders in environmental plans leads to better utilization of expenditures and contributes to supporting and improving environmental performance. This is confirmed by previous studies that have urged community participation in building plans and decision-making (Buchecker, Hunziker, & Kienast, 2003; Carter & Gronow, 2005; Hansen & Mäenpää, 2007; Reed, 2008). All of the respondents' views are similar concerning the determination of environmental expenditures and the development of environmental performance in the government sector. Most of the answers gathered indicate that the ministers and the financial department are responsible for the allocation of environmental expenditures in the budget. Furthermore, the majority of the respondents comment on the development of the budget in terms of the design of the items and the preparation of the budget. In the same vein, respondents show the significance of creating effective budget items and linking these items with annual indicators to measure the achievement of the objectives of the ministry. As well, some respondents emphasized the need to train staff and improve measurement tools and expenditure control, particularly capital expenditures.

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