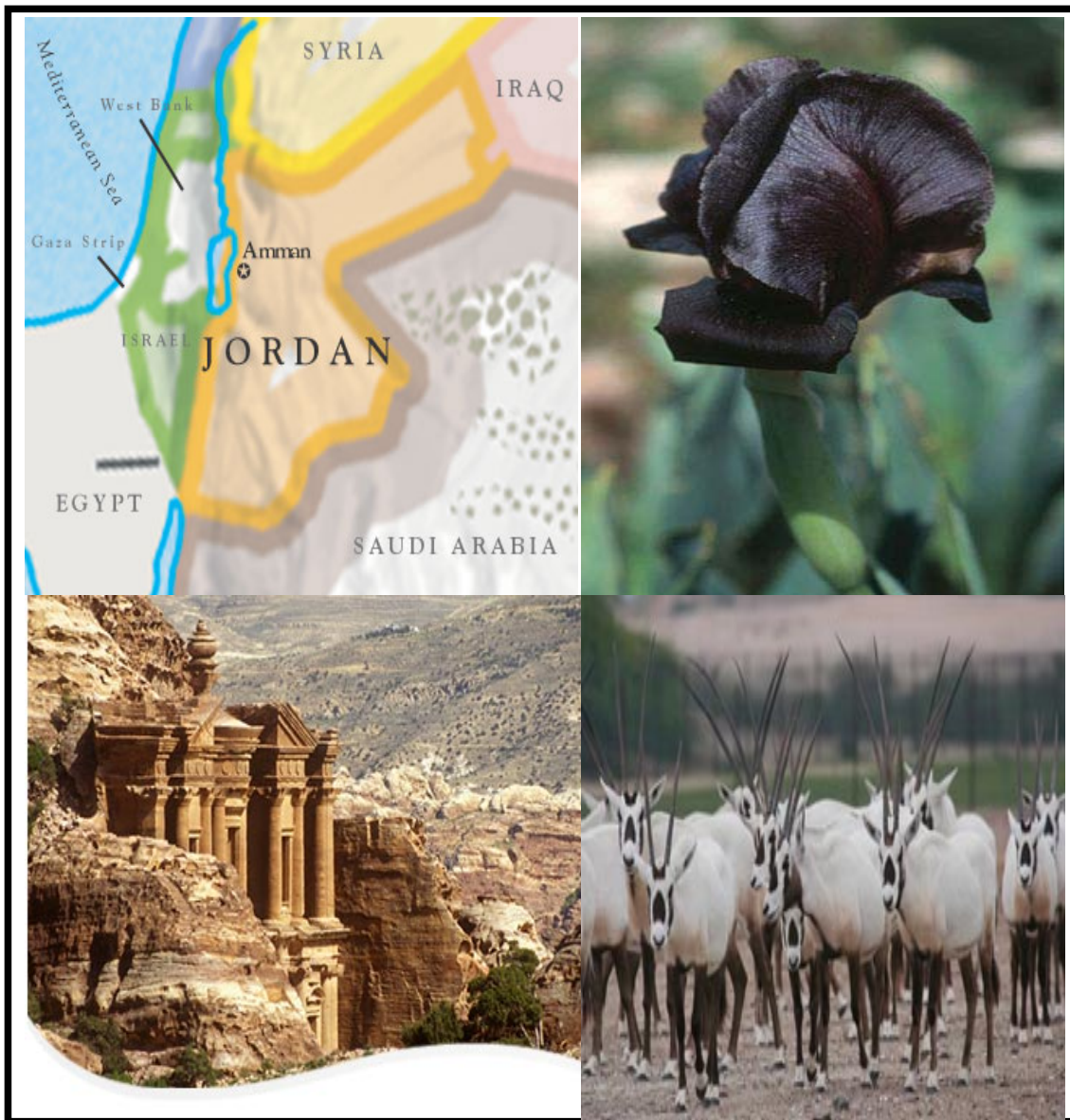


UNESCO-IHE INSTITUTE FOR WATER EDUCATION



Comparing Public Environmental Expenditures with Environmental Priorities - Jordan

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Master of Science Thesis
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Abstract

This Research presents a detailed analysis of the public environmental expenditures in Jordan. The research includes 13 public ministries and one of NGOs. It examines the extent to which the expenditures are connected to MDG goal– 7 (Ensuring Environmental Sustainability) for the time frame of 2000 to 2007.

The research is based on international systems of environmental accounting established by the UN System of Integrated Environmental and Economic Accounting revised UN SEEA 2003 (particularly the Environmental Protection Expenditure Account, EPEA). The scope of the analysis includes expenditures on environmental domains compatible with Classification Environmental Protection and Expenditure CEPA that for the most of these expenditures are better categorized and related to goal -7

The information provided by PEERs greatly increases the visibility of environmental protection and management activities. Also provided guidance to the environment and finance ministries on areas where reforms were urgently needed. Once a public expenditure review is about much more than statistics on budget execution, it should provide a context for environmental policy including key issues, and links to development strategies priorities such as ensuring environmental sustainability (goal-7).

The aim of the research is to show the current situation of environmental expenditure in Jordan regarding the priorities achieved to given date. It gives peer view for policy makers to evaluate expenditure programmes in term of adequately and allocation over environmental priorities. Moreover, it gives estimations of the necessary fund to mitigate environmental impacts. Furthermore the current research represents the first database for public environmental expenditure in Jordan.

The key findings from the analyses of environmental expenditure are as follows:

- In aggregate terms, public environmental expenditures have increased from about JD 220 million in 2000 to about JD 306 million in 2007 in constant prices (2000=100). Total public expenditure on the environment as a percentage of GDP is 3.7% in 2007. Expressed as a percentage of total governmental expenditures, the public environmental expenditures amount to 8.1% of total government expenditure.

- Most of the public environmental expenditure is from budgetary sources (Treasury), typically at average 70% of total PEE over the period (2000-2007) and at average 30% of total PEE over the same period from off-budgetary sources like foreign loans, grants and other sources.

The final conclusion of the research states that, environmental expenditure programmes were reflected totally in 3 out of 6 activities linked with the progress indicators of (goal 7).

The largest percentage of money is spent on proportion of population using an improved drinking water source and an improved sanitation facility, which indicated that this is the upmost priority of the Jordan government.

Also, the research results show that there were reflecting of environmental expenditures programmes to some extent in two priorities, forest and waste management. While there was missing alignment between environmental expenditures programmes and air pollution patterns.

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CURRENCY EQUIVALENTS

(Exchange Rate of JD is Fixed with US\$, for the study time frame (2000-2007))

Currency Unit	=	Jordanian Dinar (JD)
1 JD	=	US\$1.41
US\$1	=	0.708 Jordanian Dinar

FISCAL YEAR
January 1-31 December

List of symbols

CEA	country environmental analysis
CEPA	Classification of Environmental Protection Activities and Expenditure (SEEA, Eurostat/UNECE)
CO ₂	Carbon Dioxide
COFOG	Classification of the Functions of Government
EFS	environmental financing strategy
EPER	Environmental Protection Expenditure and Revenues (OECD/Eurostat questionnaire)
EPR	environmental performance review
EU	European Union
GDP	gross domestic product
IMF	International Monetary Fund
ISIC	International Standard Industrial Classification of All Economic Activities
J/Q	Joint OECD/Eurostat questionnaire
MDGs	Millennium Development Goals
MoEnv	Ministry of Environment
MOF	Ministry of Finance
NEAP	National Environmental Action Plan
NGO	Nongovernmental Organisation
OECD	Organisation for Economic Co-operation and Development
PAC	Pollution Abatement Control
PEE	Public Environmental Expenditure
PEERs	Public Environmental Expenditure Reviews
SEEA	System of Environmental and Economic Accounts
RSCN	Royal Society for Conservation the Nature

1 Introduction

Many developing countries are experiencing serious financial difficulties, which constrain their ability to spend on environment protection. Also, spending on the environment is often a small fraction of total governmental budget, to manage this problem policy makers are deemed to distribute scarce resources over alternative competitive means. As alternatives, they need to prioritize the spending on the environment.

Policy makers in Jordan also have tried to cope with the challenges. Therefore, many initiatives have been started in the last two decades by environmental policy makers in Jordan in terms of developing legislation, policy documents, and taking part in international environmental agreements. In this sense Jordan is to a certain extent exemplary for the global trend to give increasing attention to environmental issues.

As respond to the challenges policy makers set many policies to meet the eight millennium development goals (MDGs) and devoted institutional, human and financing resources to achieve by 2015 the (MDGs). The majority targets and indicators of (Goal 7) “ensuring environmental sustainability” are corresponding to the national environmental priorities in Jordan.

Achieving environmental sustainability (MDG7) is a particular challenge in a country that suffers from environmental degradation, drought and severe shortages of water. The Government of Jordan has long been committed to strengthening the environment as part of its strategy of attaining a degree of sustainable development (UNDP 2007).

Policy priorities outcomes can be assessed from policy documents (laws, regulations etc...) and from the public environmental expenditures which defined by Eurostat (2005) as environmental protection expenditure (EPE) is the money spent on all purposeful activities directly aimed at the prevention, reduction and elimination of pollution or any other degradation of the environment (EUROSTAT 2005).

Environmental Protection Expenditure is an indicator of the response from society to reduce environmental pressure and move towards sustainability. Since Jordan has been paying attention to environmental issues since the 1960s improvements are also attributed as part of day-to-day activities, where no specific expenditures to protect the environment can be identified.

Apparently the need of integrate the environment and the economic which will help to measure the contribution of the environment to the economy and the impact of the economy on the environment. The research at hand aims to compare public environmental expenditures with the progress of environmental priorities and Goal-7 that will evaluate to which extent the environmental policies priorities are reflected in public environmental expenditure programmes in Jordan over the period (2000-2007).

1.2 Jordan Background

Due to its location and climatic conditions, Jordan has limited fresh water resources supply that have been approximated at around one billion cubic meters annually. Jordan is one of the ten most water-poor countries in the world, already running at a water deficit of 500 million cubic meters per year, thus, the challenges are daunting (Saqr 2001).

Notwithstanding the difficult regional political environment and the lack of resources, Jordan has achieved above-average development outcomes compared to other lower middle-income countries. This favorable situation can be credited to sound development policies,

Environment is one of the major challenges in Jordan, during the last few years, Jordan made substantial efforts in strengthening its environmental institutions by establishing a Ministry of Environment, and in enacting an environmental protection law and environment impact assessment (EIA) regulations. However, more progress is needed to consolidate the institutional setup for environmental management, particularly on EIA and pollution management (monitoring, enforcement). In addition, management of solid waste consumes increasing public resources and requires both a comprehensive strategy and innovative approaches.

The performance of Jordan's water sector has seen significant progress through efforts to improve the operational efficiency of both water supply and irrigation sub-sectors.

In order to enhance the country's water resources, recent major investments in capital improvements have both increased the supply of bulk water and enhanced the wastewater treatment capacity. The Government is also working to invest in expensive non-renewable sources (e.g. Disi-Amman transfer). The capital expenditure and financing cost of the project will cause significant financial strain.

1.3 Scope of the research

The research is based on international systems of environmental accounting established by the UN System of Integrated Environmental and Economic Accounting revised UN SEEA (2003), particularly the Environmental Protection Expenditure Account (EPEA). The international acceptance especially it was revised by the most concerned international bodies such as United Nations, Eurostat, IMF, OECD and the World Bank. The scope of the research involves the analysis of public sector environmentally concerned, because environmental protection activities in Jordan are attributed to the public sector ministries and state-owned enterprises the special producers which their activities mainly concentrated in the infrastructure sectors (transport, electricity, water, and housing urban development).

The research excluded environmental expenditures by NGOs, private sector and households. Investments of private sector are still far away in environmental protection activities despite some initial investments on waste management and recycling.

1.4 Environmental Policies in Jordan

The review of the historical development of environmental policies in Jordan and the out comes of those policies is essential in order to show the development of Jordan

environmental priorities and the linkage between those priorities and (Goal-7). Also to measure what is being done to protect the environment in terms of protection and management activities and the expenditures of those activities. Moreover to track the development and shifting with priorities setting which in turn responsible for the shifting of environmental expenditure programmes in Jordan.

Another major development affecting Jordan's environmental policy is the adoption since 2001 of the Millennium Declaration and the pledge to reach the eight Millennium Development Goals (MDGs), Goal 7 "Ensuring Environmental Sustainability which will be highlight and compare with public expenditures in this review as set of Jordan environmental priorities.

Concerning the specific targets related to Goal 7 (Ensure Environmental Sustainability), the centre of this research, Jordan registered sharp improvement in the proportion of population with access to improved water resources, sanitation and secure tenure. Some studies carried out on air quality in certain areas show that overall lead concentration during 2002 reached an average of 0.23 micrograms per cubic meter of air compared to the 0.50 level permitted by international standards.

Goal 7 of the MDGs is "ensuring environmental sustainability" and it has three specific targets (targets 9-11 of the MDGs) as follows:

_ Target 9: Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources.

_ Target 10: Halve by 2015 the proportion of people without sustainable access to safe drinking water

_ Target 11: Have achieved by 2020 a significant improvement in the lives of at least 100 million slum dwellers. The table below shows the detailed analysis of progress made in environmental sustainability (Goal 7) in Jordan

Table 2.1 Progress made in environmental sustainability (goal 7) in Jordan

Target 9: Integrate the principles of sustainable development into country policies and programs and reverse the loss of environmental resources					
Indicator	1990	2001/2	2005	State of Goal Achievement	State of Supportive Environment
Proportion of land area covered by forest	0.44%	0.84%	0.90%	Potentially	Weak but improving
Land area protected to maintain biological diversity	0.14%	0.44%	10.90%		
Energy use (Kg oil equivalent) per \$1,000 (PPP) GDP	205	243	260		
Carbon dioxide emissions (per capita) (plus two figures of global atmospheric pollution: ozone depletion and the accumulation of global warming gases)	2.2 835 ton	3.15 251 ton	3.07 201.2 ton		
Target 10: Halve by 2015 the proportion of people without sustainable access to safe Drinking water					
Indicators	1990	2001/2	2005	State of Goal Achievement	State of Supportive Environment
Proportion of population with sustainable access to an improved water source	92.8%	97%	97%	Achieved	Well developed
Target 11: Have achieved by 2020 a significant improvement in the lives of at least 100 million slum dwellers					

Indicators	1990	2001/2	2005	State of Goal Achievement	State of Supportive Environment
Proportion of people with access to improved sanitation	48%	60.1%	65.0%	Potentially	Fair
Proportion of people with access to secure tenure (urban/rural disaggregating)	72%	76.2%	-----		

Source: Jordan MDG Report 2004 and (UN 2007)

1.4.1 Jordan Environmental Priorities

Several documents have established a prioritisation in Jordan which derived from both national and international actions that Jordan was committing since the 1990s.

In April 2006 as one of considerable steps toward process of capacity building and strategic planning The Ministry of Environment has formed a committee of its staff to undergo the process of review of previous and current environment and development strategies, and perform a detailed content analysis of those strategies resulting in a suggested conceptual framework for a new Environmental Action Plan that will cover the period 2006-2012.

The Strategy Review “Taskforce” divided the priorities mentioned in the previous strategies into three levels (Ministry-of-Environment 2006):

- Level 1: recommendations/ themes that are still a priority and were not achieved yet.
- Level 2: recommendations/ themes that are still a priority but a considerable amount of effort has been done to achieve them.
- Level 3: Recommendations/ themes not considered a priority now.

(1): Themes included in the National Agenda

It is important to focus in this new environment strategy and action plan on the themes included in the National Agenda hence that these themes will be the government's priority of work in the years to come and these priorities are:

1. Institutional, organizational and legislative framework for the environmental sector in Jordan.
2. Environmental pollution: (Which includes the health and the environment, industrial pollution, transportation vehicles caused pollution and all types of chemical pollution)
3. Waste Management.
4. Biodiversity (which includes eco-tourism and the protection of the Natural Heritage)
5. Land use Management and combat desertification (and that include the sustainable agro-culture and the rehabilitation of the environmentally deteriorated spots).
6. The protection of the costal zones.

(2): the main environmental themes in the previous strategies

A group of the main environmental strategic themes can be concluded repeatedly mentioned in all the previous environmental strategies as follows:

7. Water Resources Management.
8. Energy and environment – and that include the climate change and the alternative energy.

(3): themes that were not covered properly in the previous sectoral strategies

9. Poverty and Environment. (That includes socio-economy and local development projects)

(4): new themes arise from the strategic objectives of the ministry and the paper produced by the committee for sustainable development

10. Environmental economy: and that includes environmental incentives, trade and environment and cleaner production.

In addition to these technical themes a group of other cross-cutting issues and technical instruments will be used as common themes included in each of the general themes which are:

1. Capacity building
2. Education and awareness
3. Knowledge management
4. Environmental impact assessment
5. Monitoring and auditing
6. Regional and international cooperation
7. Development of financial resources
8. Public participation
9. Academic research and technology

The relationship between (Goal-7) “ensuring environmental sustainability” and environmental priorities in Jordan is apparently closed and has a directly linkage, especially priorities from level 1 and level 2. This linkage helps us to identify environmental priorities in Jordan which is the first step toward rational decisions on public environmental expenditure programmes PEEs. The conception of that is when government wants to address environmental problems, priorities must be set and ranked so that limited resources can be channelled toward solutions to the most acute problems (Fulai 2006).

The identification of priorities is particularly needed in times of financial difficulty in such country like Jordan in order to shield the most important environmental objectives from disinvestment. Also, when we link and compare public environmental expenditures (PEEs) to the environmental priorities, which are represented in this research by Ensuring Environmental Sustainability (Goal-7), such a linkage will enable us to target PEEs to specific environmental problems, justify the relative weights given to various priority issues, and assess the effectiveness of PEEs in achieving established environmental goals.

2 Methodology

This chapter presents the methodological procedures applied in this research which consist of theoretical and technique methods. It starts with the research design to show the consisting of used methods with the research objectives, then it shows the definitions and guidelines (see annex 1) which are followed in this research to make the borders for data collections procedures.

2.1 Research design

2.1.1 Problem statement

Although the pro-activeness of Jordan's policy makers is commendable, up to now there is no monitoring of the public spending on the environment and there is a problem of a lack of insight into prioritisation both in terms of policy documentation and expenditures, and that connects with the progress in realization of the MDGs. Also, there is no information available on levels, trends and distribution of public environmental expenditure.

An important initial step is to determine what should be considered the policy priorities these may be contained in fulfillment of Agenda 21 or the country's Millennium Development Goals. This research examines the set of priorities in fulfillment of Jordan Millennium Development Goals mainly (goal-7).

2.1.2 Aim of the research

The research compares and evaluates to which extent progress and environmental public expenditure reflect the policies priorities in Jordan for the time frame 2000-2007. This comparison will instrumental to surface the progress with respect to the realization of Goal 7 the Millennium Development Goal of ensuring environmental sustainability; (Goal-7, Target-9, 10 and 11).

2.1.3 Research Objectives

Main Objectives of the research

- 1- Analysis the current situation of environmental expenditure over all and providing a database of public environmental expenditure in Jordan.
- 2- Examines the shift that might occur in environmental priorities and the affect of that shifting on the expenditures programmes.
- 3- Presents the relation ship between public environmental expenditure and the progress of (goal-7) "ensuring environmental sustainability".
- 4- Measure the performance and achievement of the Millennium Development Goal of ensuring environmental sustainability; (Goal-7, Target-9, 10 and 11).
- 5- Establish the levels, trends and distribution of environmental expenditure in relation to the country's environmental priorities.

2.2 Research Techniques

The framework of the study involved a complete survey for all the environmental concerned public institutes in Jordan as a scope of the study by categorizing those institutes on base of their spending on environmental protection activities linked with MDGs (Goal-7).

2.2.1 Scope of the research

Since environment is a crosscutting issue, expenditure on it is made and found in different sectors as well as at national and sub national levels, therefore it has been gathered from the review of different sector's programmes/strategies, planning/budget, and the budget allocation and expenditure on environment policies made by central government.

The framework of the research involved 13 public institutes and one NGOs (The Royal Society for the Conservation of Nature RSCN) for its mandatory role from Ministry of Environment as executed institute to be concerned of Biodiversity and Reservations in Jordan.

Each institute nominated one mandatory as working group member in CEA leading by the ministry of environment as focal point of his/her institute and to represent the institute in PEERs meetings which held to discuss the scope and definitions of environmental protection activities. The necessary harmonised UN System Classification of Environmental Protection Activities CEPA (see annex 3), and other definitions and guidelines of definitions criteria were provide to the working group members.

2.2.2 Definition and Classification of Environmental Expenditure

According to the World Bank Environment Strategy Paper Lundethors and Swanson (2003), public environmental expenditure is defined as expenditure by public institutions for purposeful activities aimed directly at the prevention, reduction, and elimination of pollution or any other degradation of the environment resulting from human activities, as well as natural resource management activities not aimed at resource exploitation or production.

The key innovations in this research are to cover all environmental expenditure activities in relation to SEEA methodological principles, guidelines and the definitions (see research methodology annex 1). Also the first step in conducting the PEER was the development of a proper classification system compatible with conventions established at the international level, the procedures were as the following:

- Introduce of **CEPA definitions and its subcategories** for environmental protection expenditure domains (see annex 2). A major part of the form completion guidance document was devoted to the explanation of these definitions.
- Inclusion of **environment related expenditure** items for water resources (including drinking water supply), forest and housing and urban development.
- Introducing activities related to **Rehabilitation of facilities** in each CEPA groups as result of detection of this activity in the majority Ministries activities.
- Compliance with SEEA explored criteria guidelines of environmental expenditure activities definition

The above principles adopted under agreement with the different ministries working group members and through a first round of data collections to cover all expenditures related to environment activities that might not fit to CEPA classification alone (see table 2.1).

Table 2.1 Environmental Expenditure Activities

Environmental Expenditures			
Environmental management			
Environmental extended expenditure			
Environmental protection (CEPA)			
Pollution abatement and control (PAC) [air, water, waste, soil, noise, radiation]	Protection of biodiversity and landscapes	Mobilisation of natural resources (e.g. water supply)	Other natural resource Management (agri-env. payments, sustainable forestry)

Source: OECD/Eurostat, EPE and Revenue, Joint Questionnaire (2005)

In addition to the classification of environmental protection activities expenditures CEPA and for combined expenditures on Goal-7 with CEPA and with the accounting system the Classification of the Functions of Government (COFOG), we introduced additional addendums Functional Classification which covered water supply, forestry and housing development as shown in the table (2.2).

Based on the functional classification this classification was harmonized with the United Nations Handbook of National Accounting - Integrated Environmental and Economic Accounting (SEEA) CEPA. The one digit for CEPA was edit to match the functional classification codes, that for making the aggregation of expenditures easy and comparable for the coming years. Also to make the expenditures comparable with other countries that might use such a system.

Table 2.2 Summary of Estimated Public Expenditures According to Functional Classification

code	Functional Division	code	Functional Group	Current Expenditures	Capital Expenditures	Total
704	Economic affairs	7042	Agriculture, forestry, fishing, and hunting			
		7042.1	Forestry			
		Total				
705	Environmental protection	7051	Waste management			
		7052	Waste water Management			
		7053	Pollution abatement			
		7054	Protection of biodiversity and landscape			
		7055	R and D Environmental Protection			
		7056	Environmental Protection n.e.c.			
		Total				
706	Housing and community amenities	7061	Housing development			
		7063	Water supply			
		Total				
710	Social Protection	7106	Housing			
		Total				

Source: General Budget Law Report (2007)

Note: Item 7042.1 Forestry separated from 7042 to serve the purpose of this research.

2.2.3 Data Collection

As different sources individually could be insufficient to have complete data on environmental expenditures in public sector, it was useful to consider different sources of data. The approach used to collect data is the mixed approaches which include:

1- Survey, questionnaire

The data from all governmental institutions are firstly obtained by questionnaire which prepared and developed based on CEPA. This questionnaire of the environmental expenditure (Harmonised CEPA) was breakdown to sub environmental domains categories similar to CEPA in (Annex 2)

The questionnaire was distributed to the involved Ministries, and the working group members were asked to provide the data on specific deadlines.

In addition to that they were asked to distinguish expenditures on the financial sources criteria and by type of expenditures, current and capital expenditure:

- One's own sources
- Budget (Treasury)
- Grants and subsidies from public budget
- Grants and subsidies from abroad
- Grants and subsidies from other sources
- Loans and financial assistance

2- Budget, Annual Reports and Annual Accounts analysis

Budget analysis is a method of deriving data directly from the budgetary document reports and annual accounts published by the various government units. Economic information on government transactions in these budgetary documents includes the receipts and uses of funds by the various government units.

Within each ministry, province or municipality, the various departments have their own budget which follows an economic classification (current and capital expenditure, salaries, purchase of goods and services or transfers).

The budgetary documents used were:

1. **Central government budget:** data from budget lines within the environmental field.
2. **Annual reports:** environmental protection expenditures within central ministries not identified by study of the government budget or by the survey.
3. **Annual accounts for municipalities:** environmental protection expenditure for municipalities (Greater Amman Municipality).

In addition to the questionnaire the annual budgets, reports and accounts of these ministries and municipalities were collected and analysed as complementary to the questionnaire and to avoid data gaps.

A budgetary analysis means running a syntactic analysis. As the label of the budget line is often not sufficient to classify the expenditure as in CEPA group and more information describing the activity are usually needed. Thus each expenditure item is analysed based on all the information available in the budgetary document, such as the description of the expenditure, whether or not the item falls within the field of analysis, its nature and the domain it belongs to.

This work required a detailed list of activities by domain and the explanatory information for each domain, as budgets do not always clearly define the purpose of

transactions, the classification of expenditure in environmental or non-environmental expenditure category, and also in a specific environmental domain. This work was quite difficult and took a long time.

The analysis of these reports despite the difficulties mentioned above was useful because the analysis made it possible to:

- Avoid the misleading of definitions by working group members that might occur during filling the questionnaire.
- Reviewing the aggregated expenditure data providing by the questionnaire to make sure there is a full understanding of CEPA.
- Providing enough time to follow up the working group members and to correct data on time.
- Some expenditures data especially the old one was difficult to be found in the specific ministry.
- Comparing the obtained data from questionnaire with data in the reports as a reference to the totals of data summations.
- The Ministries' reports generally provide physical data, such as the volume of waste collected or the area of land purchased for environmental protection.
- Provide general scope about where the environmental expenditure could be found.

2.2.4 Data Verification

After the data were collected and manipulated the data were validated through reviewing visiting to each ministry to approve the data. The visits involved financial and projects managers in each institutes. Also the visits involved the financial analyst of each ministry in General Budget Department.

2.2.5 Analytical framework

The core of the analysis will include the linkage of expenditures with policies priorities, mainly target 9, 10, 11 of (Goal-7). The analytical needed for PEERs, a multidimensional, analysis classification system is proposed. Depending on data availability, the underlying principle is that total expenditure should be the same for each dimension. The proposed dimensions, with examples of coverage for each, are:

- Institute (department or other institution, Core and non Core Institute)
- Economic (capital or current expenditure)
- Functional role of government (execution, policy development, regulation)
- Environmental domain (air, water, waste)
- Financial (Source of funds such as foreign aid, loans).

After data were collected and verified, actualized value of the prices applied to reflect the inflation rates over the period (2000-2007) based on year 2000 (2000 = 100). Thereafter, a critical analysis to the public environmental expenditures data was done to make sure that the objectives of the research were accomplished. Next chapter shows that analysis.

3 Data Analysis and Results

Analysis and interpretation of the data improve the approach to the information that the decision-maker can use to take a decision. The objective of this chapter is to show how to use the results, on an aggregate level, how important and useful are the different variables, different environmental domains and the sectors concerned.

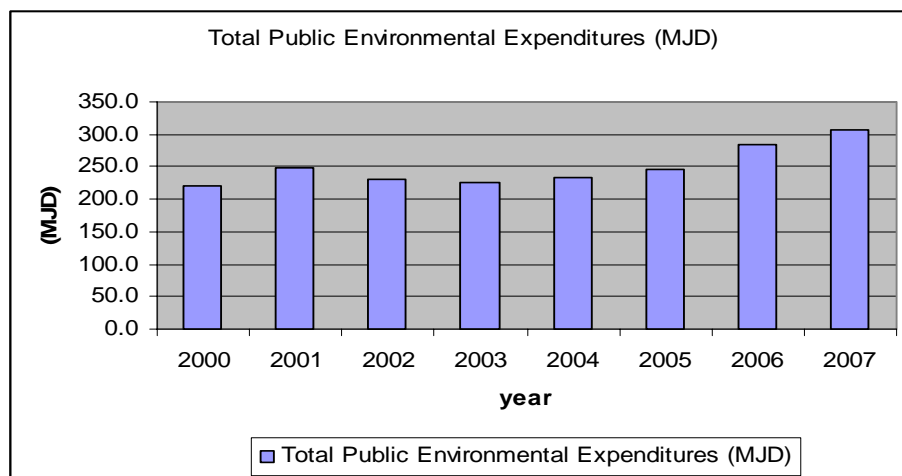
The analysis presented in this chapter involves the following dimensions:

1. Economic, to show who is pay the money (Total, capital or recurrent expenditure)
2. Ministry, to show who is spending (department or other institution, Core and non Core Ministries)
3. Functional role of government, to show where the money is spending (Provision services, policy development, regulation).
4. Finical, to show different sources of the spending money (Source of funds such as foreign aid).
5. Special Producers, Water Authority of Jordan (WAJ) and Housing and Urban Development Corporation (HUDC).
6. Environmental domains, to link expenditures with environmental priorities (air, water).
7. Activities related to the indicators of goal-7 targets.

Total public environmental expenditures by Economic dimension

Figure 3.1 shows the evolution of total public environmental spending during 2000-2007, from 29.9 MJD in 2000 to 306.1 MJD in 2007. It is obvious from the chart that the total government expenditure on environment is increasing which is explained the extent does the General Government assumed responsibility for such producing environmental protection services and the increasing importance of the environment that is given by the government. The largest spending was in the last year 2007.

Figure 3.1 Total Environmental Expenditure over the period (2000-2007)

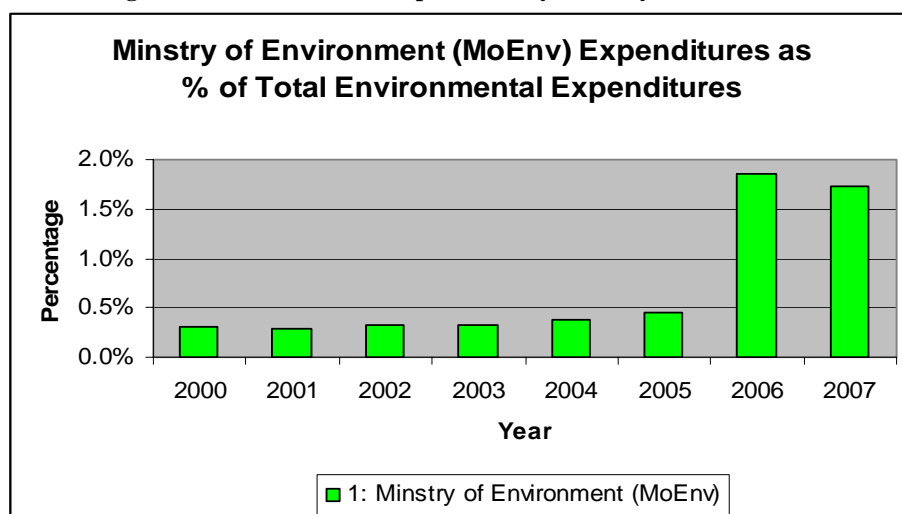


Source: Public Environmental Expenditures (PEE) data obtained from the current MSc thesis research

Also in Figure 3.2 another indicator to show that is increasing attention of the government with environmental issues. This indicator is the increased expenditure of

Ministry of the Environment in the last two years comparing with the period from (2000-2005). In some countries environmental expenditures by ministry of environment consider as a proxy for the total environmental expenditures in all the country.

Figure 3.2 Environmental Expenditure by Ministry of environment



Source: Public Environmental Expenditures (PEE) data obtained from the current MSc thesis research

Public Environmental Expenditure as a percentage of GDP

The proportions of total public environmental expenditures (PEE) to gross domestic product (GDP) and the public environmental expenditures to total government expenditures is estimated and presented in table 3.1.

Table 3.1 Total PEE Proportion in GDP and Total Public Expenditure (Constant Prices, 2000=100)

	2000	2001	2002	2003	2004	2005	2006	2007
GDP at Constant Prices (Million JD)	5,989.1	6,181.3	6,587.1	6,841.3	7,522.8	7,845.2	8,083.8	8,230.7
Inflation Rate	0.7	1.8	1.8	2.3	2.6	6.5	6.3	5.4
Total Governmental Expenditure (MJD)	2,529.0	2,636.6	2,695.7	3,075.0	3,352.4	3,497.2	3,698.7	3,794.7
% of GDP	42.2%	42.7%	40.9%	44.9%	44.6%	44.6%	45.8%	46.1%
:-of Which from Central Government	2,187.1	2,258.7	2,294.5	2,628.7	2,898.2	3,015.1	3,123.2	3,220.4
:-of Which from Independent Institutions	341.9	378.0	401.1	446.3	454.2	482.1	575.5	574.2
Environmental Expenditure (MJD)	219.9	249.0	230.4	226.8	232.8	245.9	283.4	306.1
% of GDP	3.7%	4.0%	3.5%	3.3%	3.1%	3.1%	3.5%	3.7%
% of Total Governmental Expenditure	8.7%	9.4%	8.5%	7.4%	6.9%	7.0%	7.7%	8.1%

Source: Data for GDP and General government expenditure by Department of Statistics. PEERs data obtained from the current MSc thesis research

Ratios of Current to Capital expenditures

Another critical indicator of environmental expenditures is the ratio of current to capital expenditures. Its obvious that Jordan is building the environmental infrastructure, the distinction between investment and current expenditures has been to help in identifying patterns of environmental protection efforts over time, typically,

when PAC measures or Waste Water Treatment are first implemented, actual expenditure accounts for a large share of total PAC expenditures. Over time, current expenditure becomes increasingly important. A very high ratio of current to capital expenditures may mean that the state is not investing enough in the sector and is incurring large recurrent costs. The obtained data shows that the main components of the operating (current) spending are in the form of salaries, wages, operating cost, transferring cost and others.

Table 3.2 Public Capital and Current Environmental Expenditures

Expenditure	2000	2001	2002	2003	2004	2005	2006	2007
A+B: Total Expenditures	219.9	249.0	230.4	226.8	232.8	245.9	283.4	306.1
A: Total Public (C1+C2)	164.2	175.1	170.0	168.0	149.6	158.9	162.7	217.6
% of Total Expenditures	75%	70%	74%	74%	64%	65%	57%	71%
C1: Public Current	65.6	69.4	69.6	68.4	66.8	67.6	71.9	53.1
% of Total Expenditures	30%	28%	30%	30%	29%	28%	25%	17%
% of Total Public Expenditures	40%	40%	41%	41%	45%	43%	44%	24%
C2: Public Capital	98.7	105.6	100.4	99.6	82.8	91.3	90.8	164.5
% of Total Expenditures	45%	42%	44%	44%	36%	37%	32%	54%
% of Total Public Expenditures	60%	60%	59%	59%	55%	57%	56%	76%
B: Total Capital from non Budgetary sources	55.7	73.9	60.4	58.8	83.2	87.0	120.7	88.5
% of Total Expenditures	25%	30%	26%	26%	36%	35%	43%	29%

Source: Public Environmental Expenditures (PEE) data obtained from the current MSc thesis research

It's apparent that in 2007 a great jump occurred with capital expenditures. This attributed to allocated 250 million JD in this year to establishing different Sewerage systems in different areas in Jordan. Also, that related to establishing Environmental Police by Ministry of Environment with approximately cost JD million 25, to be the executive tool of the environmental regulations and acts in Jordan. That is reflecting again the adopting policies outcomes which aimed to achieve environmental priorities.

Efficiency and effectiveness of environmental expenditures

Another indicator for assessing public environmental expenditure is the efficiency of the expenditure. Table 3.3 provides a comparison of targeted and actual spending of five ministries during the fiscal year 2006. Despite the usual bureaucracy of public systems, the government was able to process and actually spend about 73 percent of the targeted environmental expenditure of five ministries. Through the field observations it's noticed that even this actual spending is inadequate and its self is a subject to budgetary ceilings constraints from regulated system inside the ministry its self also applied as instructions from ministry of finance.

Table 3.3 Targeted vs Actual spending of expenditure in 2006 (JD)

Ministry	Targeted	Actual	Actual Fund as % of Target
Ministry of Municipalities	4,017,000	3,277,000	0.82
Ministry of Planning	3,320,000	1,550,000	0.47
Ministry of Energy	1,000,000	1,000,000	1.00
Ministry of Transport	1,730,000	1,652,000	0.95
Ministry of Environment	1,590,000	1,077,000	0.68
Total	11,657,000	8,556,000	0.73

Source: Ministry of Finance, Department of General Budget

Expenditures by core and non Core Environmental Ministries

The results in table 3.4 and in table 3.5 represent as it was expected the wide gap between core and non core Environmental Ministries. This analysis helps in examining the degree of environmental mainstreaming within the government ministries. Also, give a clear picture about the proposed activities in each sector that need to be done. Also shows the consistence with environmental polices. In table 5.4 its obvious that the Ministry made the big considerable expenditure is the Ministry of water and its bodies Water Authority of Jordan (WAJ) and Jordan Valley Authority (JVA), this big expenditures reflect the wide extent the financial burden for environmental protection fall and show that the expenditures and environmental interventions are concentrated in water sector.

Table 3.4 Public Environmental Expenditures by Core Environmental Ministries

Expenditure (000 JD)	2000	2001	2002	2003	2004	2005	2006	2007
By core environmental agencies:	189,164.6	214,283.6	196,402.9	192,490.1	192,423.0	200,759.9	234,162.0	242,132.0
% of Total PEE	86.0%	86.1%	85.2%	84.9%	82.7%	81.6%	82.6%	79.1%
1: Ministry of Environment (MoEnv)	669.1	715.7	765.1	720.8	887.2	1,105.3	5,260.9	5,300.4
% of Total PEE	0.3%	0.3%	0.3%	0.3%	0.4%	0.4%	1.9%	1.7%
2: Royal Society (RSCN)	1,710	1,564	2,126	2,091	2,604	1,922	1,659	1,262.5
% of Total PEE	0.8%	0.6%	0.9%	0.9%	1.1%	0.8%	0.6%	0.4%
3: Water Sector, MWI, WJA and JVA	186,785.8	212,003.6	193,511.5	189,678.8	188,931.9	197,732.4	227,242.2	235,569.1
% of Total PEE	84.9%	85.2%	84.0%	83.6%	81.2%	80.4%	80.2%	76.9%

Source: Public Environmental Expenditures (PEE) data obtained from the current MSc thesis research

The activities of this Ministry are concerned water issues in Jordan, and especially water supply and waste water. Those two activities separately formed around 42% of total environmental expenditures in Jordan, with percentage 36 % for water supply and 8% for waste water respectively of total environmental expenditures, considering the trend in pressures on the quality of the environment those two activities are the sectors with higher levels of pollution (the more polluting activities) and they are the same as those spend more on environmental protection.

The track of environmental expenditures in table 3.5 apparently seems that no adequate fund is provided in non core environmental ministries. This misleading fund with the activities of those ministries is attributed to lack of financial resources.

Ministry of Health\ Environmental Health Directorate for example is currently takling a lot drinking water quality control measurements, controlling medical hazardous wastes, Air pollution measurements (before establishing Ministry of environment in 2003) but as it obvious it received the lest fund.

Table 3.5 Public Environmental Expenditures by non Core Environmental Ministries

Expenditure (000 JD)	2000	2001	2002	2003	2004	2005	2006	2007
By noncore environmental agencies	30,014.4	33,766.6	33,192.0	33,508.9	39,671.1	44,129.3	48,349.1	64,004.3
% of Total Environmental Expenditure	13.6%	13.6%	14.4%	14.8%	17.0%	17.9%	17.1%	20.9%
Ministry of Agriculture	4,105.6	3,961.5	3,880.7	3,916.3	4,136.4	4,145.4	5,217.4	6,680.6

% of Total Environmental Expenditure	1.9%	1.6%	1.7%	1.7%	1.8%	1.7%	1.8%	2.2%
(MoH)\ Environmental Health Directorate	231.0	205.8	195.3	218.0	192.3	209.6	254.3	148.0
% of Total Environmental Expenditure	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.05%
Ministry of Energy (MoE)	3,363.0	1,799.4	1,555.9	2,469.9	3,101.8	2,249.3	2,905.9	2,299.6
% of Total Environmental Expenditure	1.5%	0.7%	0.7%	1.1%	1.3%	0.9%	1.0%	0.8%
MoT (Metrology & Airport)	1,405.3	1,308.5	1,319.9	1,365.3	1,355.5	1,380.9	1,350.0	1,365.0
% of Total Environmental Expenditure	0.6%	0.5%	0.6%	0.6%	0.6%	0.6%	0.5%	0.4%
Ministry of Municipality	795.0	1,009.3	882.1	926.2	852.3	1,124.6	1,720.8	2,152.4
% of Total Environmental Expenditure	0.4%	0.4%	0.4%	0.4%	0.4%	0.5%	0.6%	0.7%
Ministry of Planning	2,066.7	3,123.2	3,540.1	4,861.4	4,038.6	4,046.7	4,152.5	4,531.3
% of Total Environmental Expenditure	0.9%	1.3%	1.5%	2.1%	1.7%	1.6%	1.5%	1.5%
Total GAM Expenditure	5,509.6	6,034.3	7,266.7	7,784.3	13,200.3	16,130.0	13,122.0	15,938.6
% of Total Environmental Expenditure	2.5%	2.4%	3.2%	3.4%	5.7%	6.6%	4.6%	5.2%
Ministry of Tourism & Antiques	0.0	345.2	203.4	993.6	1,290.3	1,508.0	565.2	1,069.4
% of Total Environmental Expenditure	0.0%	0.1%	0.1%	0.4%	0.6%	0.6%	0.2%	0.3%
Housing & Urban Development Corporation (HUDC)	12,538.2	15,979.4	14,347.9	10,974.1	11,503.8	13,334.7	19,061.1	29,819.5
% of Total Environmental Expenditure	5.7%	6.4%	6.2%	4.8%	4.9%	5.4%	6.7%	9.7%

Source: Public Environmental Expenditures (PEE) data obtained from the current MSc thesis research

Total Expenditures by financing dimension

Table 3.6 represents different sources of fund that help to examine sources of fund mainstreaming in environmental activities and how much is earmarked. Those sources in Jordan include sources from central governmental budget, and off-budget sources. Total capitals non-budgetary sources which involves only capital expenditures includes capital from privatization revenue, capital from loans, capital from national agenda and capitals from grants & others. Privatization revenue is that source of fund obtained from privatization procedures, the government used it to supply addition fund for different general activities, mainly to pay back the external debts which reached to 67% of GDP. Some parts of this revenue used as additional funds for the urgent social aspects in Jordan. Especially water and waste water activities. National Agenda fund is generated from adoption of the government to the national agenda in 2001. That reflects the government intention to reflect the expenditure programmes in the policies priorities by introducing especial fund to cover the important activities in Jordan especially the environmental priorities. Taking into account that majority of the environmental priorities initially they based on national Agenda 21. The financial resources of National Agenda consist of national and international donors resources.

Table 3.6 Total Expenditures on Environment, Current Capital and Source of Financing

Expenditure	2000	2001	2002	2003	2004	2005	2006	2007
A+B: Total Environmental Expenditures	219.9	249.0	230.4	226.8	232.8	245.9	283.4	306.1
A: Total Public Expenditures	164.2	175.1	170.0	168.0	149.6	158.9	162.7	217.6
% of Total Expenditures	75%	70%	74%	74%	64%	65%	57%	71%
B: Total Capital from non Budgetary sources	55.7	73.9	60.4	58.8	83.2	87.0	120.7	88.5
% of Total Expenditures	25%	30%	26%	26%	36%	35%	43%	29%
1: Capital From Privatization Revenue	10.78	10.70	14.13	0.00	8.88	5.11	3.12	0.00
% of Total Expenditures	5%	4%	6%	0%	3%	2%	1%	0%
2: Capital from Loans	28.67	34.81	37.95	40.09	31.47	28.36	43.29	43.14
% of Total Expenditures	0.13	0.14	0.16	0.17	0.12	0.10	0.12	0.11
3: Capital from National Agenda							26.27	

% of Total Expenditures							7%	
4: Capitals from Grants & Others	16.20	28.39	8.31	18.72	42.82	53.51	48.02	45.38
% of Total Expenditures	7%	11%	3%	8%	17%	19%	14%	11%

Source: Public Environmental Expenditures (PEE) data obtained from the current MSc thesis research

Functional dimension

Functional dimension analysis is an attempt to account for the main approaches that government can take in dealing with an environmental problem. Total public environmental expenditures for policymaking, including the development of regulations and standards related to technical research and development expenditures (R&D) whether those expenditures done for environmental protection or natural resource management: The results in table 3.7 show that there is an increasing in the environmental expenditures by the government as result of the measurements that taken by policymakers which reflected in environmental expenditures programmes in Environmental Management & Regulations which increased from 0.4% in 2000 to 1% in 2007 of total public environmental expenditures. These activities expected to receive more than this percentage as it was ranked between the first's priorities in the new Environmental Action Plan that will cover the period 2006-2012, and in R & D. The major expenditures was on research related to protection of water, its reflected again the important of this domain in Jordan. While the least expenditure was on protection of ambient air,

Table 3.7 Environmental Expenditures on Management, Regulations & capacity Building (Constant Prices)

Expenditures (000 JD)	2000	2001	2002	2003	2004	2005	2006	2007
Research and development	2,273.5	2,634.4	3,629.9	2,257.9	3,260.6	2,275.0	2,430.5	4,563.0
% of Total Domains Expenditure	1.5%	1.5%	2.3%	1.4%	2.0%	1.3%	1.1%	1.8%
Environment Management & Regulations	577.3	358.6	412.7	382.8	315.6	583.6	1,181.6	2,528.0
% of Total Domains Expenditure	0.4%	0.2%	0.3%	0.2%	0.2%	0.3%	0.6%	1.0%
General environmental administration and management		0.0	0.0	0.0	0.0	0.0	16.0	260.5
General administration, regulation and the like		0.0	0.0	0.0	0.0	0.0	803.9	1,919.0
Environmental management		0.0	0.0	0.0	0.0	294.1	91.8	37.8
Education, training and information	577.3	358.6	412.7	382.8	315.6	289.5	269.9	310.7

Source: Public Environmental Expenditures (PEE) data obtained from the current MSc thesis research

Another critical indicator is the ability of the government for provision the environmental services includes waste management and waste water management. The table 5.8 presents those two domains and their percentages of total environmental expenditures.

Table 3.8 Environmental Expenditures on Provision Services , Waste management and Waste water management domains (Constant Prices)

Expenditures (000 JD)	2000	2001	2002	2003	2004	2005	2006	2007
Waste management	6,333.9	7,462.8	8,426.8	9,618.4	15,646.3	17,838.3	17,644.2	17,539.3
% of Total Domains Expenditure	4.1%	4.2%	5.2%	6.1%	9.4%	10.0%	8.3%	6.9%
Wastewater management	13,063.6	13,225.6	11,741.6	12,562.4	17,695.8	14,852.3	29,949.3	73,852.3
% of Total Domains Expenditure	8.5%	7.4%	7.3%	7.9%	10.7%	8.3%	14.2%	29.2%

Source: Public Environmental Expenditures (PEE) data obtained from the current MSc thesis research

Recently 90% of treated water is used in agriculture, that reflect the quality of the treated water, that in one hand, in other hand this directly linked with (Goal-7) target of ensuring sanitation facilities.

The result also represents that the percentage of expenditure on waste water domain increased from 8% in 2000 to 29% in 2007. In waste management the results shows increasing from 4% in 2000 to 10% in 2005, but it declining in 2006 and 2007 respectively. Another issue represented here that is the hazardous waste. Jordan to date faces this problem and a lot of efforts should be done to mitigate this problem in proper way especially with the development industry and the population growth that expected for the coming years.

Special Producers Dimension

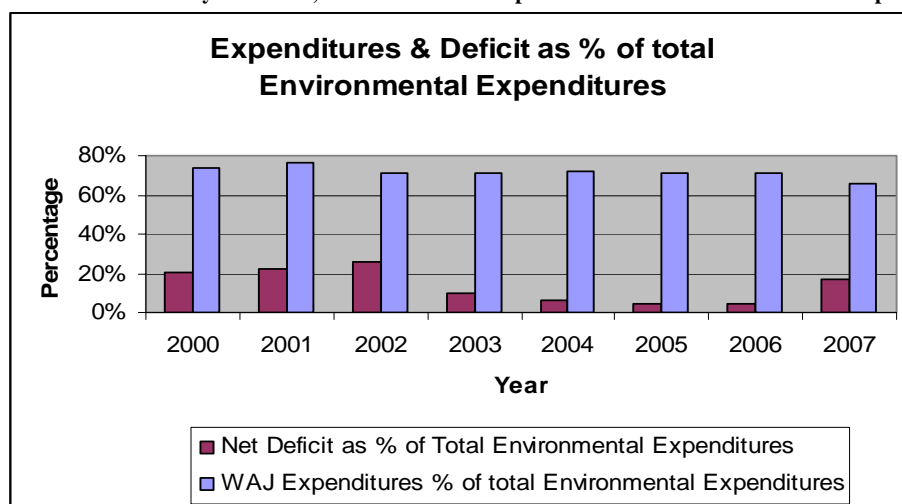
Special producers dimension refers to physical infrastructure to mitigate harmful environmental effects. These expenditures made by state-owned companies (Special Producers, locally known Independents General Institutions), they consist of two large effective institutes in the field of water and housing in Jordan.

Water Authority of Jordan WAJ represents the major body in the field of water supply and sewage management in Jordan, it provides more than 60% of total drinking water and manage the total sewerage system in the Kingdom.

The increasing deficit from JD million 45 in 2000 to JD million in 68 in 2007 reflects the burden faced WAJ to manage the pressure in such water supply, sewerage system and waste water management activities which considered the first priorities along the history of environmental priorities in Jordan.

Figure 3.9 shows that WAJ total environmental expenditures at average reached 72% of total public environmental expenditures over the period (2000-2007). Also the percentages of expenditures in WAJ in table 3.17 show that the majority of sources from off-budgetary are allocated to WAJ, at average 78% over the same period, for example 95% of total grants allocated to environmental sector over the period (2000-2007) were directed totally to WAJ. In 2007 100% of total grants for total environmental sector embarked totally to WAJ.

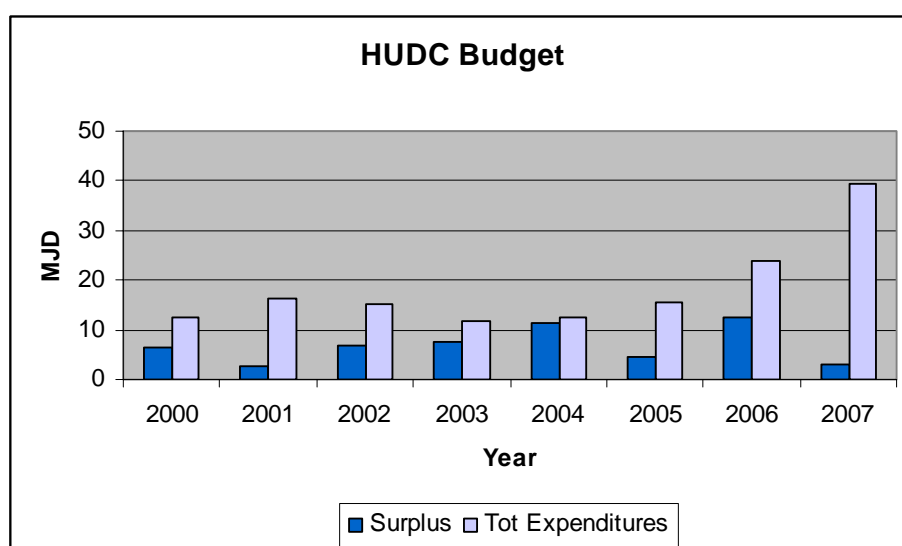
Figure 3.9 Water Authority of Jordan, % of Deficit and Expenditures of total Environmental Expenditures



Source: Budget data obtained through analysis of budgets and WAJ annual reports analysis. PEER data obtained from the current MSc thesis Research

Expenditures by Housing & Urban Development Corporation (HUDC) represent important issue concern housing in Jordan. Figure 3.10 shows the increasing trend in expenditures while at the same time the surplus decreasing especially in 2007. The results also show that the net surplus for HUDC decline from JD Million 6.5 in 2000 to JD Million 3 in 2007 and in the same period total expenditures increased from JD Million 12.5 to about JD Million 40 that reflects the government willing to improve the situation of housing and urban development in Jordan by increasing the allocated expenditures in this activity which is linked directly with goal-7, target 11. The results also show that participation of the government in development projects increased from 6.3% in 2005 to 13% in 2007, this percentage expected to increase more for the next year to reach three folds with total JD Million 15 as it estimated in budget of FYr 2008.

Figure 3.10 Revenue and Expenditures of Housing & Urban Development Corporation



Source: Budget data obtained through analysis of budgets and HUDC annual reports analysis. PEER data obtained from the current MSc thesis Research

Environmental Expenditures by domains

The environmental domain dimension concerns the specific environmental medium that the expenditure is intended to protect. The subcategories are based on categories in the CEPA, (see annex 2). Lundethors (2003) suggested that it may be possible to use the environmental domain dimension as a proxy for the program/ policy issue dimension.

Expenditures by environmental domain provide a general indication of a government's financial efforts directed towards that domain. PEER gives an indication of the type and level of service that the government provides for the different environmental domains (for example, waste water management) and the relative importance that it attaches to the domain in relation to other services.

The results show considerable increasing in different domains and activities. Apart of some declining in domains linked with Air pollutions. That related to the quite

expensive investments in this field which is difficult to provide in such limited resources country like Jordan.

Expenditures on MDGs- (Goal 7) “ensuring environmental sustainability”

Linking expenditures data with physical data which is the aim of this research could bring valuable insights on several issues relating to environmental strategies. The domain groups provided in this research by CEPA are a particular application of this linkage by using the expenditures programmes of public sector spending on those domains and link those expenditures programmes with the indicators of progress and performance towards achieving targets of (Goal-7), set in 2000, to be achieved by 2015.

Generally Goal 7 targets fill in themes of environmental domains defined by CEPA and the addendums added such as water supply, forest and housing and urban development. The expenditures of those targets are fond of the following:

1. Expenditures on the Indicator of Proportion of land area covered by forest

The table below shows the expenditures on the indicator (7.1) Proportion of land area covered by forest, the annual afforestation and forest fires. The proportion of area covered by forest is still 0.9% of total Jordan area, despite the annual increasing of afforestation activities. The extension area to some extent equal to the forest degradation in Jordan which attributes to the droughts, shortage of water and forest fires, about 42 fires occurred annually removing about 0.11% of total forest area.

The expenditures on forest are quiet considerable percentage of total public environmental expenditure, ts even increased from 9% in 2000 to 14% in 2007. By linking the performance of forestation with the expenditures it seems that in one hand there is a strong linkage between them and the expenditures in last two years increasing compare to forestation activities but in the achieved the on the other hand the progress in the target is still slightly increased. The forest in Jordan is increasingly important, since Jordan established in the 70s the Directorate of Forest and Range Lands to look after forest issues in Jordan.

Table 3.11: Forest Expenditures (000 JD) Against Afforestation Activities, (Constant Prices)

Item	2000	2001	2002	2003	2004	2005	2006	2007
Afforestation Area (hectare)	247.8	549.2	379.4	485.8	294.4	284.9	246.4	289
Replantation Area (hectare)	13.000	97.500	114.100	141.400	46.000	252.000	74.400	143.900
Forest Fires Arae (hectare)	10.800	79.200	65.310	61.700	84.950	143.400	87.300	99.400
Net Afforestation	250.0	567.5	428.2	565.5	255.5	393.5	233.5	333.5
% of Total Forest Area	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009
Forestry Expenditure (000 JD)	1,414.6	1,452.1	1,459.2	1,414.3	1,459.7	1,480.2	2,605.5	3,473.2
% of Total Domains Expenditure	0.009	0.008	0.009	0.009	0.009	0.008	0.012	0.014

Source: physical data obtained from forest & Range lands Directorate. PEER data obtained from the current MSc thesis research

The location of Jordan in an arid area and the nature of the country about 90% of the total area is desert that made a pressure on forest in Jordan. The allocated expenditures are increased over the period (2000-2007) and within the priorities envelope, but they are not enough to show a good progress in the percentage of

forested area, so this target to some extent reflected in the environmental expenditure programmes in Jordan for the period (2000-2007)

2. Expenditures on the Indicator, Ratio of area protected to maintain biological diversity to surface area

Jordan is making sophisticated efforts and comprehensive in the areas of protection of biodiversity and natural resources through several activities. In Jordan a network of nature reserves consisting of 7 reserves covering percentage 10% of the area of Jordan, there are five other proposed reserves within this network.

RSCN manages a network of nature reserves in Jordan, a national NGO namely Royal Society for the Conservation of Nature under an agreement with the Ministry of Environment represents a unique partnership based on decentralization in the management of natural protected areas is unique in the Arab world.

Table 3.12 Expenditures on Protected Area (200-2007), (Constant Prices)

Expenditures	2000	2001	2002	2003	2004	2005	2006	2007
Protected area to total surface area, percentage	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9
Protected areas, sq. km	9734	9734	9734	9734	9734	9734	9734	9734
Expenditures on Protection of biodiversity and landscapes	2466.8	2835.7	3301.2	4231.7	4890.4	4676.3	4119.5	3679.9
as % of Total environmental Expenditures	1.6%	1.6%	2.0%	2.7%	2.9%	2.6%	1.9%	1.4%
Full Domain Protection of biodiversity and landscapes	1709.7	1564.2	2126.3	2090.6	2603.9	1922.3	1658.9	1262.5
Protection and rehabilitation of species and habitats		0.0	0.0	0.0	0.0	0.0	0.0	37.8
Protection of natural and semi-natural landscapes	175.0	209.7	311.2	1102.1	909.4	1254.1	641.8	644.9
Measurement, control, laboratories and the like	530.0	672.8	588.0	617.5	568.2	749.8	1381.5	770.3
Rehabilitation of facilities, environment, etc.	40.0	384.2	255.9	391.2	446.2	411.9	386.4	870.0
Other activities		0.0	0.0	0.0	322.6	301.6	0.0	0.0
Research and development								
Protection of species and habitats	12.1	4.8	19.8	30.3	40.1	36.6	50.9	94.4

Source: physical data obtained from RSCN. PEER data obtained from the current MSc thesis research

Although the protected area remained the same there are 5 proposed reservations will taking place in the coming years with total area 1153.8 square km to add another 1% to the percentage of the current protected area to become 11.9% of total Jordan area. Regarding this target of (Goal -7) the expenditure programmes are reflected on this target over the period (2000-2007).

3. Expenditures on the Indicators:

- Energy use (kilogram oil equivalent) per \$1 GDP (PPP).
- Carbon dioxide emissions (per capita) and consumption of ozone-depleting CFCs (ODP tons).
- Proportion of population using solid fuels.

These indicators related to Pollution Abatement Control PAC, mainly on the following groups (see table 3.13). The expenditure on those targets includes 5 domains and they combined together for the closed overlap between those domains in achieving the related targets on (goal-7).

Table 3.13 Expenditure on Pollution Abatement Control (PAC) Activities (Constant Prices)

Expenditures	2000	2001	2002	2003	2004	2005	2006	2007
PAC Expenditure (Sum 1-5)	2,967.9	1,249.0	963.6	2,209.3	2,154.8	2,072.2	3,152.4	2,622.3
% of Total Expenditure on Domains	1.9%	0.7%	0.6%	1.4%	1.3%	1.2%	1.5%	1.0%
1: Pollution abatement (Protection of ambient air, and climate)	1,116.1	1,181.2	910.9	1,786.5	1,735.7	1,634.3	2,739.4	1,914.8
% of Total Expenditure on Domains	0.7%	0.7%	0.6%	1.1%	1.0%	0.9%	1.3%	0.8%
2: Treatment of exhaust gases and ventilation air	1.9	1.8	1.8	1.8	1.7	1.6	1.5	5.2
% of Total Expenditure on Domains	0.001%	0.001%	0.001%	0.001%	0.001%	0.001%	0.001%	0.002%
3: Noise and vibration abatement		0.0	0.0	0.0	0.0	0.0	12.8	75.5
% of Total Expenditure on Domains							0.01%	0.03%
4: Protection against radiation (excluding external safety)	1,850.0	0.0	0.0	346.2	337.2	315.2	295.4	430.5
% of Total Expenditure on Domains	1.2%	0.0%	0.0%	0.2%	0.2%	0.2%	0.1%	0.2%
5: Research and Development								
Protection of ambient air				62.7	43.3	76	23.9	120.8
Protection of atmosphere and climate		65.9	50.9	12.2	36.9	45.0	79.4	75.5

Source: PEER data obtained from the current MSc thesis research

The table below shows the performance of Jordan to meet the target of Carbon dioxide emissions which are still increasing indicating that the air pollution in Jordan still a serious problem. Per capita and per \$1 GDP (PPP) approximately still the same. Consumption of ozone-depleting substances is dropped from 746.6 in 2000 to 201.2 in 2005 which reflect the regulations efficiency on this regard.

The factories are the most important sources of air pollution, particularly in industrial areas such as Zarqa and Sahab, Rusifah and the Hashemite area and industrial free zones, financial investments and technical substantial effort are needed to reduce the sources of pollution. The vehicles are the second source of pollution, especially in carbon pollutants.

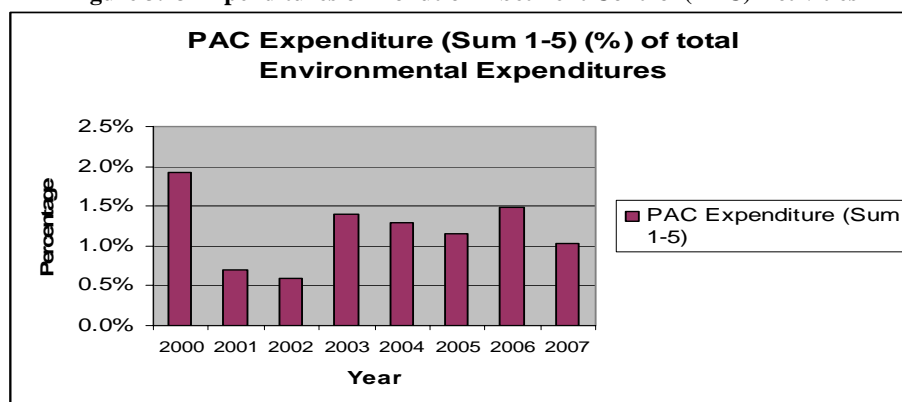
Table 3.14 on Pollution Abatement Control (PAC) Performance

Indicators	2000	2001	2002	2003	2004	2005
Carbon dioxide emissions (CO ₂), thousand metric tons of CO ₂ (CDIAC)	15,523.0	15,501.0	16,366.3	17,099.5	16,465.3	
Carbon dioxide emissions (CO ₂), metric tons of CO ₂ per capita (CDIAC)	3.2348	3.1515	3.2377	3.2842	3.0658	
Consumption of all Ozone-Depleting Substances in ODP metric tons	746.6	607.7	267	228.6	196.9	201.2
Consumption of ozone-depleting CFCs in ODP metric tons	354	321	90	74.4	58.4	59.6
Energy use (Kg oil equivalent) per \$1,000 (PPP) GDP	260	243	241	239	260	

Source: Jordan MDG Report 2004 and (UN 2007)

In figure 3.13 the trend decreased from 1.9% in 2000 to 1% in 2007, this indicate that the pressure of Air pollution is still remained which obvious from Jordan performance in CO₂ emissions.

Figure 3.13 Expenditures on Pollution Abatement Control (PAC) Activities



Source: PEER data obtained from the current MSc thesis research

Since for the last 5 years the expenditures in term of the amount of money spent on PAC are slightly increased that mean the government on the track to achieve some progress in Air Pollution as an environmental priority, that obvious from the future steps as resulted from the sectoral and national environmental priorities concerning Air Pollution. But in this current situation there is miss alignment between environmental expenditure programmes and Air Pollution.

4. Environmental Expenditure on:

Target 7.C: Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation:

Indicator 7.7. Proportion of population using an improved drinking water source.

Indicator 7.8 Proportion of population using an improved sanitation facility

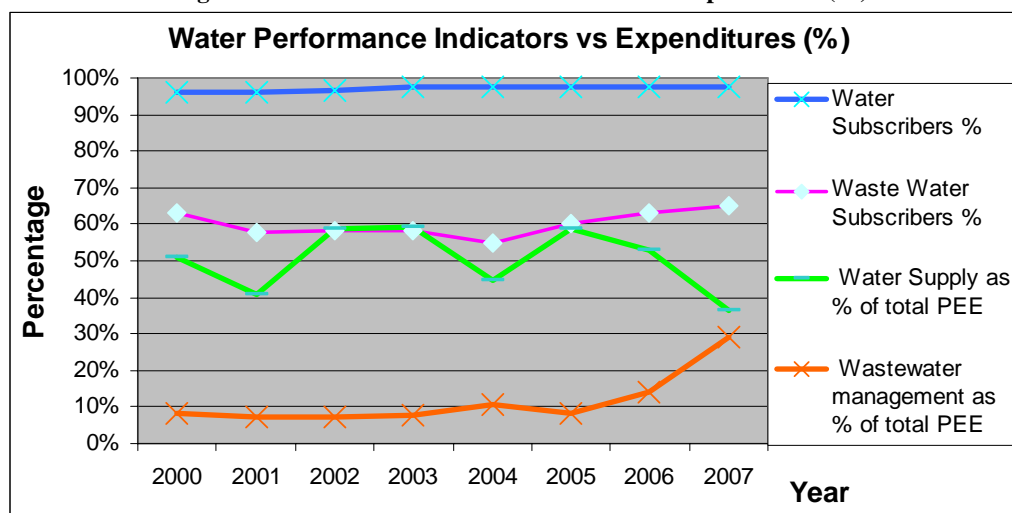
Table 3.16 shows the achievements on those indicators and figure 3.14 shows the comparison of progress on these indicators vs the expenditures.

Table 3.16 Proportion of population using an improved drinking water and an improved sanitation facility

Item	2000	2001	2002	2003	2004	2005	2006	2007
A: Water								
Subscribers No. (000)	695	723	753	770	812	826	860	865
Subscribers %	96.2	96.2	96.8	97.7	97.7	97.7	97.7	97.7
Pumped Water (MM3)	245	213	245	248	258	266	270	280
Sold water MM3	115	118	123	128	132	140	150	155
Losing Water, Percentage	0.53	0.51	0.5	0.489	0.48	0.47	0.45	0.44
B: Sewerage								
Subscribers No. (000)	400	415	432	450	488	495	510	515
Subscribers %	0.63	0.58	0.581	0.584	0.55	0.6	0.63	0.65
Treated Water (MM3)	83	88	89	91	93	101	104	110

Source: Ministry of Water and Irrigation, annual reports

Figure 3.14 Water Performance Indicators VS Expenditures (%)



Source: Ministry of Water and Irrigation, annual reports. PEER Data obtained from the current MSc thesis research

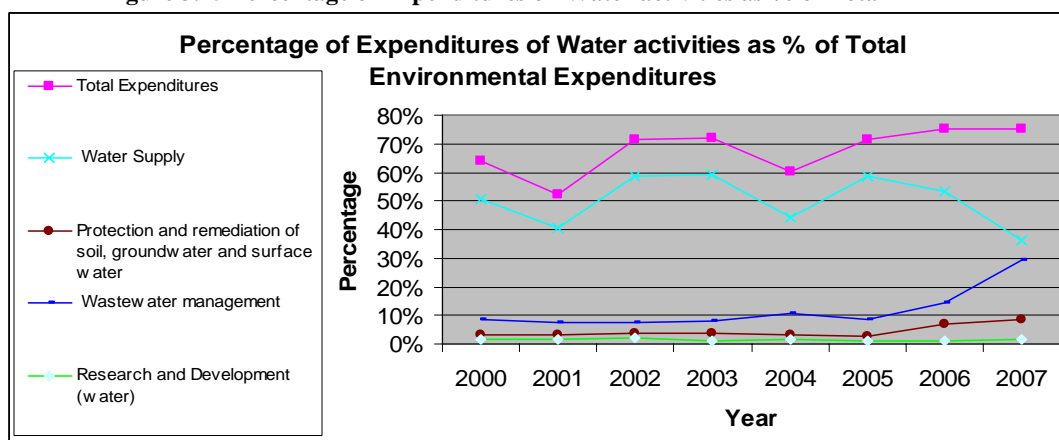
As shown in figure 5.14 environmental expenditures on both water supply and waste water are allocated effectively and increasingly over the period (2000-2007). Those two activities separately formed around 42% of total environmental expenditures in Jordan. 36 % for water supply and 8% for waste water respectively. Its obvious from the results that environmental expenditures programmes reflected on the of Proportion of population using an improved drinking water source and improved sanitation facility indicators. Even the deficit of WJA budget at average 12% of total environmental expenditures over (2000-2007) is witnessed about these increased expenditures. The results in figure 5.14 also show increasing trend of total environmental expenditures on water activities related to those indicators at average 68% over (2000-2007) and at average 75% for the last two years. The expenditures on those indicators mainly done by Ministry of Water which involves Jordan Valley Authority JAV, which provides 40% of total water supply in the Kingdome mainly from Dams, and from Water Authority of Jordan WAJ.

Table 3.17 Total Expenditure on Proportion of population using an improved drinking water source and improved sanitation facility (Constant Prices)

Expenditures (000 JD)	2000	2001	2002	2003	2004	2005	2006	2007
Total Expenditures	98,846.7	94,102.7	115,196.7	114,166.4	99,675.8	126,925.8	159,258.7	190,645.6
as % of total PEE	64%	52%	72%	72%	60%	71%	75%	75%
Water Supply	78,554.0	73,001.7	94,650.3	93,613.7	73,733.6	104,994.5	112,264.1	91,663.7
as % of total PEE	51%	41%	59%	59%	44%	59%	53%	36%
Protection and remediation of soil, surface & ground water	5,105.4	5,453.6	5,714.2	6,245.9	5,530.3	4,986.7	14,801.1	20,936.7
as % of total PEE	3.3%	3.0%	3.6%	3.9%	3.3%	2.8%	7.0%	8.3%
Wastewater management	13,063.6	13,225.6	11,741.6	12,562.4	17,695.8	14,852.3	29,949.3	73,852.3
as % of total PEE	8%	7%	7%	8%	11%	8%	14%	29%
R & D (water)	2123.709	2421.731	3090.6147	1744.4636	2716.0695	2092.3168	2244.2768	4192.9293
as % of total PEE	1.4%	1.3%	1.9%	1.1%	1.6%	1.2%	1.1%	1.7%
Protection of water	1,801.6	2,189.0	2,650.3	1,211.2	2,182.9	2,070.4	2,218.9	4,162.7
Protection of soil and groundwater	322.1	232.7	440.4	533.3	533.2	21.9	25.3	30.2

Source: PEER data obtained from the current MSc thesis research

Figure 3.15 Percentage of Expenditures on Water activities as % of Total PEE



Source: PEER data obtained from the current MSc thesis research

5. Environmental expenditure on Slum Dwellers

The recorded figure for Jordan on Slum population as percentage of urban, for the year 2001 is 15.7% slum of total urban population and the Slum population in urban areas were amounted to 623494 inhabitants. As response to that the government took vast steps to control this issue, especially in recent years, the government consider the year 2008 as a year of ensuring secure tenures for population mainly for limited and low incomes populations, the government will allocate 7 billions US\$ to this initiative which lunched on March, 2008. The expenditures on this field reflect the importance of this issue in Jordan. Table 3.18 shows the expenditures on target 11 and the projects that have been done to facilitate and enable those lower incomes population to obtain their secure tenures which reflected directly on enhancing the Slum population in Jordan. Its obvious based on the achievements of this target that environmental expenditures were on line with this target progress. So we can conclude that environmental expenditures programmes are reflected on this target.

Table 3.18 Expenditure and Performance of General Indicators in achievement a significant improvement in the lives of at least 100 million slum dwellers (Constant Prices)

	2000	2001	2002	2003	2004	2005	2006	2007
Expenditures on Housing & Urban Development	12,538.2	15,979.4	14,347.9	10,974.1	11,503.8	13,334.7	19,061.1	29,819.5
% of Total PEE	8%	9%	9%	7%	7%	7%	9%	12%
Performance General Indicators								
Projects Achieved	4	7	9	6	12	15	8	n.a
Housing Units (urbanization)	474	66	134	125	198	160	1000	n.a
Housing Units (Construction)	63	981	1101	637	3235	3370	2251	n.a
Beneficiaries No	537	1051	767	1366	2635	2750	1682	n.a

Source: Housing and Urban Development Corporation (HUDC), data obtained from analysing the annual reports

6. Environmental Expenditure on Waste Management

Waste management in this regard play a major role for ensuring environmental sustainability, reverse the loss of environmental resources and ensuring significant improvement of slum dwellers. Expenditure on waste management domain shows in table 3.20 that the percentage is increasing from 4% in 2000 to 10% in 2005, and it declining to 7% in 2007.

Table 3.20 Expenditures on Waste management domain (Constant Prices)

Expenditures (000 JD)	2000	2001	2002	2003	2004	2005	2006	2007
Waste management	6,333.9	7,462.8	8,426.8	9,618.4	15,646.3	17,838.3	17,644.2	17,539.3
% of Total Domains Expenditure	4.1%	4.2%	5.2%	6.1%	9.4%	10.0%	8.3%	6.9%

Source: PEER data obtained from the current MSc thesis research

Environmental expenditures not else were classified, n. e. c.

These expenditures mainly involved expenditures related to environmental management regulations, education, capacity buildings and information. These expenditures represent institutional capacity to manage environmental protection and management activities. Also, Environmental expenditures (not else were classified, n. e. c) are involve expenditures on other activities which didn't fit under CEPA domain groups.

The importance of these expenditures on environmental protection n.e.c, is to show the institutional capacity to manage the activities related to the indicators of goal-7 targets and to show how they spend the money wisely to achieve the progress with those indicators.

Thus this group of activities is also attributed to total expenditures on goal-7. Table 3.21 shows that the expenditures are increasing over the time for the activities environment management & regulations and for education, training and information.

Table 3.21 Expenditures on Environmental Protection n.e.c (Constant Prices)

Expenditures	2000	2001	2002	2003	2004	2005	2006	2007
Environmental Protection n.e.c-	29,638.3	56,323.3	16,666.3	15,374.3	30,206.5	11,903.7	5,648.9	5,179.0
% of Total Expenditure on Domains	19.2%	31.4%	10.4%	9.7%	18.2%	6.7%	2.7%	2.0%
General environmental administration and management		0.0	0.0	0.0	0.0	0.0	16.0	260.5
General administration, regulation and the like		0.0	0.0	0.0	0.0	0.0	803.9	1,919.0
Environmental management		0.0	0.0	0.0	0.0	294.1	91.8	37.8
Education, training and information	577.3	358.6	412.7	382.8	315.6	289.5	269.9	310.7
Activities leading to indivisible expenditure	13.0	12.7	12.4	36.1	29.0	11.1	22.4	247.7
Activities not elsewhere classified	26,848.8	53,677.2	14,150.9	12,750.1	27,641.6	8,942.1	2,020.1	15.1
Other activities	34.4	29.7	26.2	34.7	25.2	36.5	53.5	55.9
Wages	1,939.4	2,015.1	1,897.3	2,012.8	1,974.4	2,154.7	2,110.4	1,813.3
Tools	225.4	230.1	166.7	157.8	220.7	175.7	260.9	519.1

Source: PEER data obtained from the current MSc thesis research

Based on the analysis done above its obvious that the expenditures on goal-7 “ensuring environmental sustainability” are representing as a closed proxy for the public environmental expenditures on the environmental priorities in Jordan. Therefore, to examine whether the expenditures programmes are reflected on the environmental priorities in Jordan, which is the aim of the current MSc thesis research, the hypothesis of the current research will be examined in next chapter.

4. Conclusion

The core of this study is to compare environmental expenditure programmes with environmental priorities mainly (goal-7). Based on data analysis in the previous chapter it found that the total of all public environmental expenditures are directed 100% to the indicators of goal-7 targets. The analysis examined 6 environmental expenditures programmes linked with activities aimed to achieve progress on the indicators of goal-7 targets, these 6 environmental expenditures programmes list and discussed below:

1 Expenditure on the indicator ratio of area protected to maintain biological diversity to surface area. (Domain of Protection of biodiversity and landscapes).

The results shows that expenditures programmes are reflected in this indicator, these expenditure programmes forms at average 2.1% of total PEE. The shift on these expenditures was slightly observed in 2007 with 0.6% that for no additional fund from donors received at this year comparing with the other years.

2. Environmental Expenditure on (Water supply and waste water management domains):

Target 7.C: Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation:

Indicator 7.7. Proportion of population using an improved drinking water source.

Indicator 7.8 Proportion of population using an improved sanitation facility

The expenditures are reflected in the progress of those indicators which were totally achieved. The expenditure programmes forms at average 68% total PEE over the period (2000-2007) and at average 75% for the last two years. The shift on these expenditures in last two years related to the new waste water projects amounted to JD 25 million in 2007 and for the increasing expenditures in protection and remediation of soil, groundwater and surface water activities.

3. Environmental Expenditure on (Housing & Urban Development activities):

Target 7.D: By 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers.

The result shows that the target is achieved and the future investments in this field will make sure of the sustainability of this target. The expenditures programmes form at average 8.5% of total PEE over the period (2000-2007). No shift detected in these expenditures and the trend increased over the period (2000-2007).

4- Expenditures in forest

The result shows that expenditure programmes to some extent reflected in forest management. Forest performance indicator didn't show considerable increasing in forest area in Jordan, but at the same time it shows sustainability in the forest area in Jordan that reflects the increasing activities toward achieving this target. The expenditures programme form at average 1% of total PEE over the period (2000-2007). The trend is increasing over the time from 0.9% in 2000 to 1.4% of total PEE in 2007.

5- Expenditures on waste management

The result shows that expenditure programmes to some extent reflected in waste management. Waste management expenditures programmes form at average 6.8% of total PEE over the period (2000-2007). The trend shows shifting and declining from 10% in 2005 to 6.9 in 2007. That declining is for that GAM constructed in 2005 a special land fill for management solid and hazardous waste in Jordan. Generally the expenditures on waste management are inadequate regarding the challenges remind specially in hazardous waste.

6- Expenditures on air pollution patterns

The result shows missing alignment between environmental expenditure programmes and air pollution patterns. The expenditures form at average 0.9% of total PEE over the period (2000-2007) and the trend is fluctuated over time.

The future projects and regulations taking place now and in the future confirmed that the current situation is going to be changed, for example in February 2008 the government prohibited the regular gasoline and replaced it with lead-free gasoline.

Based on the hypothesis tested above, the comparison includes 6 environmental expenditure programmes on 6 activities linked directly with goal 7. The result of the test was environmental expenditure programmes success to have been fully reflected on the following activities:

The largest percentage of money is spent on proportion of population using an improved drinking water source and an improved sanitation facility. This large percentage indicated that this is the upmost priority of the Jordan government. The large attention to these environmental activities in terms of money spent is reflected in the large progress made with respect to this target which is totally achieved

The second largest percentage is spent on target “Target 7.D: By 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers” this considerable percentage at average 8.5% of total PEE over the period (2000-2000) reflected the importance that Jordan government shows to this target, also the large attention to this activity in terms of money spent is reflected with the large progress made in this target

The third largest percentage is spent on the indicator ratio of area protected to maintain biological diversity to surface area. This percentage indicated that this target is between the upmost priorities in Jordan government. Despite the percentage was not that much but it indicated that the expenditures on this target are on line with the progress made with respect to achieve this target.

Also, the test results show that there were reflecting of environmental expenditures programmes to some extent in two priorities activities, forest and waste management. While there was missing alignment between environmental expenditures programmes and air pollution patterns.

Annex 1

1. Research methodology

This part of theoretical framework of the methodology, the System of Integrated Environmental and Economic Accounting (SEEA) particularly the Environmental Protection Expenditure Account (EPEA), is chosen for the international acceptance. Also for the definition and classification system that developed by SEEA 2003 which applicable and harmonised with different definitions and classification systems of different concerned frameworks. Also its applicable for the study case in Jordan and for the research objectives mainly for (Goal 7) Ensuring Environmental Sustainability. Moreover, domains, classified by Classification of Environmental Protection Activities and Expenditures CEPA, are involving the targets of (Goal 7).

1.1 Public Environmental Expenditure Reviews PEERs

Public environmental expenditure reviews (PEERs) can be an important part of country environmental analysis (CEA).

Country Environmental Analysis (CEA): is a country-level analytical tool that can help assess the environmental priorities of countries, development and poverty reduction strategies, the environmental implications of policies, and countries institutional capacity to address their challenges.

The objective of CEA is to help integrate environmental considerations into early stages of planning and to guide capacity building and operational priorities in development assistance.

The CEA is also to be used as a framework for closer donor coordination, by helping avoid duplication of environmental analyses.

The CEA made up of three building blocks (Ahmed 2005):

1- State of Environment and Priorities for Development

2- Policy Analysis

3- PEER found on the third building block, Capacity/ Performance Assessment, which includes:

- Institutional and organizational capacity assessment.
- Methodology and processes for priority setting and cross-sectoral coordination.
- Environmental Assessment (EA) capacity assessment.
- Public environmental expenditure review (PEER).
- Indicators for measuring public sector capacity.
- Data gaps.
- Areas for intervention.

The focus In the current research on the third building block, capacity/performance assessment, which evaluates the country's capacity for managing environmental priorities by using PEER as one element of this block.

1.3 Definition and Categorization of Environmental Expenditure

1.3.1 Definition of Environmental Expenditure

Defining environmental expenditure is an important initial step for a PEER. The definition guides the selection of expenditures to be included in the review's database that then feeds into the analysis. SEEA defined Environmental Expenditure as: those which reduce or eliminate pressures on the environment and which aim at making more efficient use of natural resources.

This definition is harmonised with the proposed general definition for public environmental expenditure which developed based in the literature review. Public Environmental Expenditures are that Expenditures by public institutions for purposeful activities aimed directly at the prevention, reduction, and elimination of pollution or any other degradation of the environment resulting from human activity, as well as natural resource management activities not aimed at resource exploitation or production.

Under SEEA definition it includes those activities which are not necessarily carried out for environmental protection reasons but which nevertheless produce clear, measurable environmental benefits.

Environmental protection expenditure is classified into different economic sectors (public, agriculture, industries, and households), financial variables (treatment and prevention investments, current expenditure, subsidies etc.) and environmental domains (air, water, waste, soil, noise, biodiversity and landscape), (Eurostat, 2000).

1.3.2 Classification System

So far, once the first step in conducting the PEER was the development of a proper classification system compatible with conventions established at the international level, CEPA defines environmental protection activities, the activities are generally classified by the environmental domains which are protected for example air, water, soil and groundwater, biodiversity and landscape, (see the Box 4.1), as those where the primary purpose is the protection of the environment that is the avoidance of the negative effects on the environment caused by economic activities.

The classification suggested for this group of activities by SEEA (2003) is the Classification of Environmental Protection Activities and Expenditures CEPA.

CEPA is a generic, multipurpose, functional classification for environmental protection used for classifying activities but also products, actual outlays (expenditure) and other transactions.

CEPA defines both the environmental media and the types of expenditure to be considered. The environmental media are:

Box 4.1 Classification of Environmental Protection Activity (CEPA):

1. Protection of ambient air and climate
2. Waste water management
3. Waste management
4. Protection and remediation of soil, groundwater and surface water
5. Noise and vibration abatement
6. Protection of biodiversity and landscape
7. Protection against radiation
8. Research and development
9. Other environmental protection activities
 - 9.1 General environmental administration and management
 - 9.2 Education, training and information
 - 9.3 Activities leading to indivisible expenditure
 - 9.4 Activities not elsewhere specified

Source: Integrated Environmental and Economic Accounting SEEA (2003)

1.3.3 Guidelines of Definition Criteria

The SEEA report also explored criteria that may be used to determine whether particular expenditures should be included under its definitions. Relevant activities and expenditures are identified by the criterion of the primary purpose. Within this primary purpose definition, several variants or sub-sets have been used either in combination or separately. The guidelines criteria below were adopted as far as applicable in the current research to identify and capture the other environment-related activities and expenditures.

A) The pure purpose criterion: Activities and expenditure where the main objective is protecting the environment are included in full. This criterion works best where the main objective of protecting the environment is clear and unambiguous, for example end-of-pipe capital expenditure.

B) The extra-cost criterion: is used to identify the portion of the cost of more environmentally friendly technologies and changes in processes and products to be attributed to environmental protection. The investment and operating expenditure are compared to those of a standard or less

environmentally beneficial alternative, if there is one, or the estimated additional cost of incorporating the environmentally beneficial feature. Only the extra expenditure is included.

C) The net-cost criterion: Only expenditure undertaken for environmental protection purposes which leads to a net increase in cost (that is where spending exceeds any savings or income arising before the net cost was actually incurred) is included. When expenditure is recorded, this criterion only applies to operating expenditure.

D) The compliance criterion: Expenditure undertaken with the main objective of protecting the environment but specifically in order to comply with environmental protection legislation, conventions and voluntary agreements. This can be further sub-divided to show those activities and transactions undertaken in order to comply with legislation only.

1.3.4 Addition Environmental Activities

Natural resource management activities appear to be less firm as a category. It includes: research into management of natural resources, monitoring, control and surveillance, data collection and statistics, cost of the natural resources management authorities at various levels as well as temporary costs for facilitating structural adjustments of sectors concerned.

- Management activities

CEPA provided sound management to the conventional environmental protection activities, if those management activities are related to activities and transactions specifically for environmental protection, for example management of protected forests, are not included. (They are included under environmental protection expenditure activities where the primary purpose is the protection of the environment as mentioned above) Similarly, qualitative protection activities of natural resources, for example activities for biodiversity and landscape protection or activities aimed at preserving certain functions or the quality of the natural environment (air, water, soil and groundwater), are also included under environmental protection.

- Inland water mobilisation

Mobilisation covers all activities aimed at abstraction, treatment and distribution of water resources for their various uses, following the usefully distinguished:

1- Drinking water supply: Capital outlays for water abstraction (protection of abstraction perimeters, pumping stations, etc.), processing of drinking water, pressure build-up, storage and distribution, expenditure for major maintenance. Operating expenses such as operating cost of production facilities, energy, purchase of treatment and distribution products, metering, billing, and so on.

Industrial water mobilisation: All mobilisation activities corresponding to industrial uses of water; uses for cooling of power plants and industrial installations are included.

2- Management of water bodies

Management of water bodies may include activities involved in the transit of water from its natural status to that of controlled water status, reinforcing river banks, construction and maintenance of waterways, water engineering and dams. Dams for the production of electricity are not included. Recharging activities involved in CEPA consist of land improvement, development of vegetal cover in order to increase water infiltration and recharge groundwater bodies.

- Forest management

Management of forests includes expansion (afforestation) of wooded areas including net acquisitions of land for afforestation, their development for recreational use, inventories and assessment of forest resources, forest-related research, education, training and information activities, forest-related administration and surveillance. The increasing use of wood for construction and furniture, or use of woody biomass as fuel, etc, therefore its considered as being beneficial for the environment, as it main indicators of goal-7 "proportion of land area covered by forest". Also it substitutes products based on non-renewable resources (plastics, concrete, fossil fuels, etc.) by renewable resources and increases the net fixation of carbon.

Annex 2 Classification of Environmental Protection and Expenditures (CEPA)

Classification of Environmental Protection Activities CEPA

705 Environmental Protection:

7051 Waste management

7051.1 Prevention of pollution through in-process modifications

7051.2 Collection and transport

7051.3 Treatment and disposal of hazardous waste

7051.4 Thermal treatment

7051.5 Landfill

7051.6 Other treatment and disposal

7051.7 Treatment and disposal of non-hazardous waste

7051.8 Incineration

7051.9 Other treatment and disposal

7051.10 Measurement, control, laboratories and the like

7051.11 Rehabilitation of facilities, environment, etc.

7051.12 Other activities

7052 Wastewater management

7052.1 Prevention of pollution through in-process modifications

7052.2 Sewerage networks

7052.3 Wastewater treatment

7052.4 Treatment of cooling water

7052.5 Measurement, control, laboratories and the like

7052.6 Rehabilitation of facilities, environment, etc.

7052.7 Other activities

7053 Pollution abatement (Protection of ambient air, water and climate)

7053.1 Prevention of pollution through in-process modifications

7053.1.1 for the protection of ambient air

7053.1.2 for the protection of climate and ozone layer

7053.1.3 Measurement, control, laboratories and the like

7053.1.4 Other activities

7053.2. Treatment of exhaust gases and ventilation air

7053.2.1 for the protection of ambient air

7053.2.2 for the protection of climate and ozone layer

7053.2.3 Measurement, control, laboratories and the like

7053.2.4 Other activities

7053.3 Protection and remediation of soil, groundwater and surface water

7053.3.1 Prevention of pollutant infiltration

7053.3.2 Cleaning up of soil and water bodies

7053.3.3 Protection of soil from erosion and other physical degradation

7053.3.4 Prevention and remediation of soil salinity

7053.3.5 Measurement, control, laboratories and the like

7053.3.6 Other activities

7053.3.7 Rehabilitation of facilities, environment, etc.

7053.4 Noise and vibration abatement (excluding workplace protection)

7053.4.1 Preventive in-process modifications at the source

7053.4.2 Road and rail traffic

7053.4.3 Air traffic

7053.4.4 Industrial and other noise

7053.4.5 Construction of anti noise/vibration facilities
 7053.4.6 Road and rail traffic
 7053.4.7 Air traffic
 7053.4.8 Industrial and other noise
 7053.4.9 Measurement, control, laboratories and the like
 7053.4.10 Rehabilitation of facilities, environment, etc.
 7053.4.11 Other activities
 7053.5. Protection against radiation (excluding external safety)
 7053.5.1 Protection of ambient media
 7053.5.2 Transport and treatment of high level radioactive waste
 7053.5.3 Measurement, control, laboratories and the like
 7053.5.4 Other activities
7054 Protection of biodiversity and landscapes
 7054.1 Protection and rehabilitation of species and habitats
 7054.2 Protection of natural and semi-natural landscapes
 7054.3 Protection costs related to desertification
 7054.4 Measurement, control, laboratories and the like
 7052.5 Rehabilitation of facilities, environment, etc.
 7054.6 Other activities
7055. Research and development
 7055.1 Protection of ambient air and climate
 7055.2 Protection of ambient air
 7055.3 Protection of atmosphere and climate
 7055.4 Protection of water
 7055.5 Waste
 7055.6 Protection of soil and groundwater
 7055.7 Abatement of noise and vibration
 7055.8 Protection of species and habitats
 7055.9 Protection against radiation
 7052.10 Rehabilitation of facilities, environment, etc.
 7055.11 Other research on the environment
7056 Environmental Protection n.e.c- Other environmental protection activities
 7056.1 General environmental administration and management
 7056.2 General administration, regulation and the like
 7056.3 Environmental management
 7056.4 Education, training and information
 7056.5 Activities leading to indivisible expenditure
 7052.10 Rehabilitation of facilities, environment, etc.
 7056.6 Activities not elsewhere classified
 7056.7 Other activities
 7056.8 Wages
 7056.9 Tools
Addendum
 7063 Water Supply
 7042.1 Forestry
 7061 & 7106 Housing & Urban Development