

Evaluating International Sources and Environmental Public Policy in Egypt: The Case of Solid Waste Management

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Abstract
This paper seeks to answer the question of what are the main actors and institutions that contribute to environmental public policy change in Egypt? By examining the case of solid waste management in Egypt, the paper will discuss how environmental public policies are influenced by various organizations. The paper will also analyse various related variables: local, regional and international legal agreements; international donors, national environmental policy plans; and sustainable development strategies, environmental ministries and agencies, as well as the role of public awareness.The study uses the partnership and institutional approaches as the main theoretical approaches to the research. Thus, this study examines how partners interact in shaping the perception of society regarding the importance of environmental issues in general and solid waste management in particular in achieving sustainable development.
Keywords: Environmental Public Policy, Sustainable Development, International Donors, Solid Waste Management.

Introduction:-

Over the past few decades, environmental issues have attracted international attention, which is reflected in the public policies of most countries worldwide. Egypt, as one of the countries that signed international agreements and treaties in this respect, is obliged to attain rational environmental policies that seek to balance the requirements of sustainable economic and social development with urgent measures that are essential for preserving natural resources. To achieve this goal, the Egyptian Environment Affairs Agency (EEAA) was established in 1982 in accordance with law 4/1994, followed by the establishment of the Ministry of State for Environmental Affairs (MSEA) in 1997.[1]

Solid waste management (SWM) is considered the most important environmental problem currently facing Egypt because of its significant hazardous and harmful effects on health, the environment and consequently the national economy. These include the increasing rate of accumulated SW across cities and populated areas, inefficient methods of collecting and transferring SW (transport services are less than 30% in small towns, 70% in some metropolitan areas and virtually non-existent in most slum or rural areas), a lack of adequate storage containers and insufficient public waste dumps compatible with environmental and health requirements.[2]

Other challenges may include the lack of formal and well declared policies, strategic goals and action programs to address the increasing problem of defective SWM. Egypt's main problem is the absence of an integrated, consistent SWM system due to the nonexistence of an institutional infrastructure capable of the necessary processes of planning, organizing and implementing such a persistent SWM system,[3] coupled with the weak legislation and executive bodies required to establish a complete, integrated and ongoing SWM system.[4]

Methodology

This study uses the partnership and institutional approaches as the main theoretical approaches to the research. Approaching the study from a partnership perspective implies investigating the combined efforts of the government (with special emphasis on the governorate level), civil society and the private sector as well as national, regional or international bodies, whether through formal partnerships or informal cooperation, in facing a public environmental problem. In addition, the institutional perspective dwells on how this affects policy outcomes by investigating how they function and interact, as well as the effects of these institutions on other institutions and society.

Thus, this study examines how partners interact in shaping society's perception of the importance of environmental issues in general and solid waste management in particular in achieving sustainable development. The paper examines how goals are achieved by strengthening the roles of all partners through coordination, leading to effective participation in the preparation, implementation, plan monitoring, policy enactment,

[1]Ministry of Environment official site, retrieved from:-http://www.eeaa.gov.eg/english/main/about_detail.asp
[2] Tarek Zaki, and Amine Khayal, "Country Report on the solid waste management in Egypt," SWEEP NET,Jul.2010.
[3] Milik, Sohair Mourad. 'Assessment Of Solid Waste Management In Egypt During The Last Decade In Light Of The Partnership Between The Egyptian Government And The Private Sector'. *Dar.aucegypt.edu*. N.p., 2011, p.155.
[4] Anon, (2015). [online] Retrieved from: http://www.sweep-net.org/ckfinder/.../rapport-Egypte-en.pdf.

objectives, programs and projects. This will be analysed in terms of the policies and objectives; the instruments; the implementation; and the impact.

Regarding data collection, the study encompasses qualitative and quantitative analysis, depending on primary data-collection, through the analysis of documents attained from the MSEA and surveying NGOs members and executives (heads of environmental directorates in Suez canal governorates), as well as the target beneficiaries; academic literature, articles and reports are also used as secondary sources for the research.

Introducing Environmental Public Polices in Egypt

As stated above, Egypt's the first environmental body was the EEAA, which was initially established by Presidential Decree No. 631/1982. The agency endorsed its first National Environment Action Plan (NEAP), which marked a turning point in tackling the challenge of the environment and development in Egypt. NEAP (1992-2002) was the first public policy introduced to mobilize efforts of government, international donors and various public policy partners towards addressing major national environmental issues, in addition to building Egypt's environmental infrastructure. This first action plan known as NEAP has divided environmental policies into four major environmental issues (air quality, water quality, solid waste and coastal zone management) during the period 1992-2002.[1]

In 1994, an Environment Protection Law was enacted, restructuring the EEAA with a new mandate according to Law no. 4 for the Protection of the Environment, transforming it into the executive body of the Ministry of State for Environmental Affairs (MSEA). This body was established in June 1997 by Presidential Decree no. 275/1997. The MSEA focused on close collaboration with national and international development partners, defining environmental policies, setting priorities and implementing initiatives within a context of sustainable development.[2]

Environmental Policies in the Suez Canal Region

This section uses governmental expenditures and budget allocation for environmental development as an indicator by analysing data from three consecutive fiscal years (2013/2014, 2014/2015 and 2015/2016) in six governorates that together constitute what is known as "the Suez Canal region". These governorates resemble approximately 22% of total number of governorates in Egypt (which is 27).[3]

As shown in figures 1 – 7, which exhibit the distribution of the state budget among local basic needs, environmental development comes in third in all six Suez Canal region governorates after spending on electricity and roads. An overall average of 20% of the government's budget is earmarked to enhance environment in the Suez Canal Region governorates with the exception of North Sinai; there, security and traffic are placed before the environment, which comes in 4th place.

In Ismailia, 23,985,000 L.E. is allocated for environmental development in the current fiscal year 2015/2016, a 5% increase from the previous year 2014/2015 (22,913,000 L.E.);[4] only 7,200,000 L.E. were allotted in 2013/2014 (see figure 1). It is noteworthy that the Ismailia governorate is in the southern portion of the Suez governorates and north of Port Said along the Suez Canal. Ismailia is privileged with the Temsah and Grand Morra lakes. The governorate has diverse tourist attractions and takes pride in its clean environment and green areas.[5]

[1] Hegazy, Ibrahim Rizk. "Urban Strategies And Environmental Policy: Towards Urban Sustainability within the Egyptian Context." *Environmental Development* 11. (2014), p.201.
[2] Law 4 for the Protection of the Environment amended by Law 9/2009, retrieved from:- http://www.eeaa.gov.eg/english/main/law4.asp
[3] State Information Service official site, retrieved from:- http://www.sis.gov.eg/En/Templates/Articles/tmpArticles.aspx?CatID=2631
[4] Ministry of Planning, regional planning sector, Suez Canal, budget report, Unpublished manuscript, 2015/2016.
[5] http://www.sis.gov.eg/En/Templates/Articles/tmpArticles.aspx?CatID=2636
*1,800,100 (2013/2014)

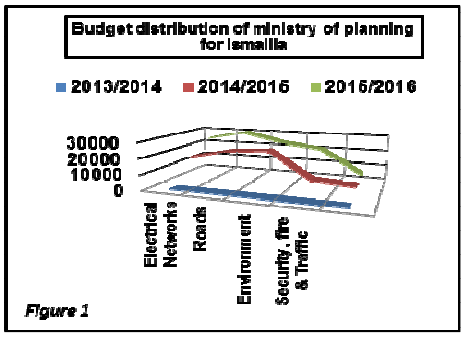

Figure 1

In contrast, government expenditure has noticeably increased in Port Said (see figure 2)* by 80% from 4,730,000 L.E. (2014/2015) to 24,115,000 (2015/2016) due to the need to address urgent environmental issues related to the deterioration of environmental conditions in Port Said from 2007 to 2013 due to the increase in industrial pollution. As the only free city in Egypt, Port Said is struggling to manage its growing population and limited geographical area.

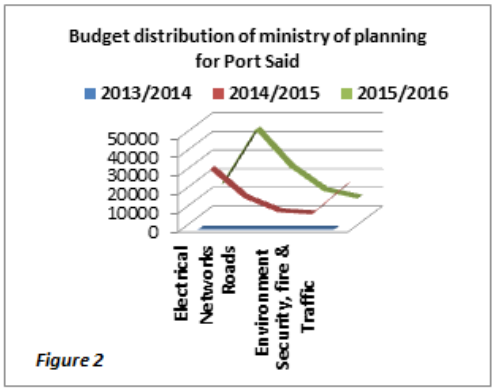

Figure 2

The South Sinai governorate lies in the southern tier of Sinai Peninsula. Famous for its touristic attractions (Saint Catherine Monastery, Ras Muhammad, Saint Catherine, Wadi Ferran, Ras Seddr, Tour Sinai, Dahab, Nuaba'a and Sharm al-Sheikh), preserving the environment is highly important for the tourism industry in Egypt. This is reflected in the 70.4% increase (see figure 3) in the governmental budget allocation for environmental development in South Sinai,* from 8,864,000 L.E. (2014/2015) to 29,914,000 L.E. (2015/2016).[1]

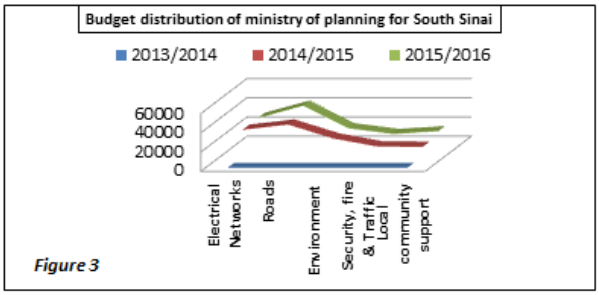

Figure 3

On the other hand, North Sinai was the only Suez Canal Region governorate that witnessed a 8.9% drop in environmental spending in the governmental expenditure budget, (see figure 4), from 18,574,000 L.E. (2014/2015) to 16,918,000 L.E. (2015/2016). This decrease could be a result of the vital need to channel allocations to other pressing issues, mainly security, local municipality support and roads due to prevailing political conditions.

[1] http://www.sis.gov.eg/En/Templates/Articles/tmpArticles.aspx?CatID=265/8
*3,100,800 (2013/2014).

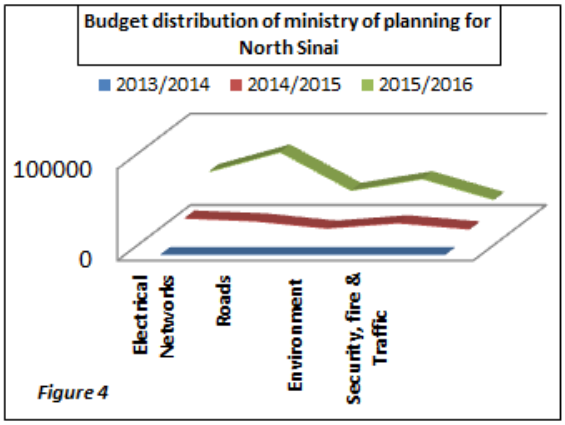

Figure 4

Suez is one of Egypt's strategic governorates. It is host to the mega project of developing the northwest of the Suez Gulf along the Red Sea. Oil distillation, processing and packing of cement, textiles industry, medicine glass bottles, fertilizers and chemicals and shipping and unloading goods are just a few of the industrial activities that may endanger the environment, a fact that was taken into consideration by policy makers. This was reflected in a 38.5% increase in the environmental development budget of the Suez Governorate, (see figure 5), from 14,927,000 L.E. (2014/2015) to 24,251,000 L.E. (2015/2016).

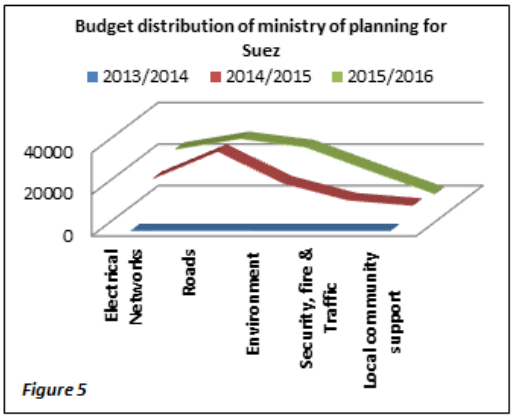

Figure 5

Al-Sharkeya governorate, known for being a heavily populated agricultural governorate, also witnessed a 40% increase in its assigned sum in the national budget for environmental development, (see figure 6), from 36,662,000 L.E. (2014/2015) to 60,948,000 L.E. (2015/2016).

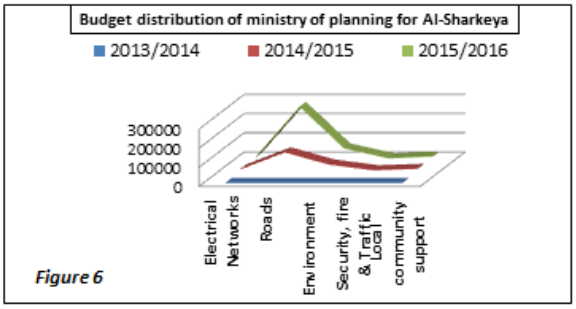

Figure 6

It can be concluded, then, by analysing data derived from the "National Governmental Expenditure Plan", during the three fiscal years mentioned above, that environmental public policies have been endorsed and supported by the Egyptian government throughout the Suez Canal region, (see figure 7).

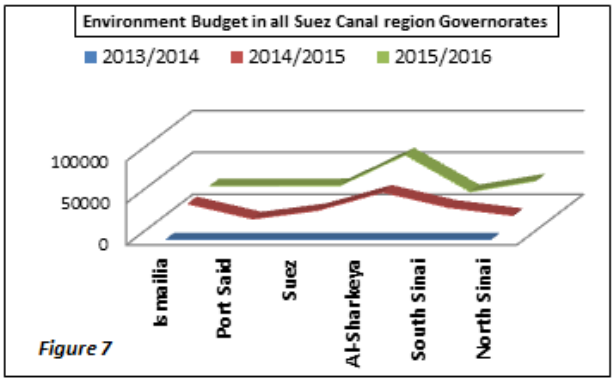

Figure 7

Solid Waste Management in Egypt

When the "Black Cloud phenomena"* first appeared in 1998,[1] there was no SWM policy in Egypt. This was one of the basic reasons for the introduction and implementation of NEAP. The 1st and second action plans aim to create a partnership between stakeholders and various development partners to assume full responsibility for the formulation and implementation of environmental policy in a bid to ensure sustainable development. NEAP reflects the Rio Earth Summit declaration of environmental protection as a key component of sustainable development along with economic growth and social development.

a- The First National Environmental Action Plan (NEAP) 1992-2002:

By 2002, Egypt had adopted the principle of Integrated Municipal Solid Waste Management (IMSWM), in which a fast track program to manage 12 million cubic meters of accumulated waste in major 11 governorates was implemented.[2] This action included the collection and transfer of waste to dumping sites in the desert, avoiding the conventional disposal method, public burning of waste. Governorates and municipalities also encouraged farmers and consumers to reuse such agricultural wastes as fodders and compost after necessary treatment. This strategy also allowed international and local private operators to provide integrated solid waste management services such as collection, transportation, treatment and disposal services.[3]

During the first NEAP, the EEAA, along with the Ministry of Local Development, have succeeded in upgrading dump sites, identifying 53 landfill sites and establishing 55 municipal solid waste composting plants at a total cost of 265 million Egyptian pounds, provided by the state.[4]

This preliminary SWM strategy did not take into consideration important issues such as public awareness, social consideration and public consultation required for the public policy process, as well as risk guarantees for private sector contractors. Also in this first action plan, SWM was only addressed in urban areas; delivering effective, simple and affordable management services to the local, rural communities of Egypt remained an unmet goal.[5].

b- The Second National Environmental Action Plan (NEAP) 2002-2017:

This 15-year action plan details 13 projects on solid waste treatment, dividing these projects into *first priority*, which includes municipal solid wastes, agricultural solid wastes and health care wastes in addition to construction and demolition wastes, and *second priority* hazardous industrial wastes.[6]

Currently being implemented, this action plan attempts to address three basic challenges. The first is the persistent problem of accumulated waste (97 million tons in 2001) in both rural and urban areas due to low collection rates currently ranging from 30 to 77%. A shortage of landfill sites for waste disposal as well as deficiencies in collecting and transporting methods is the second challenge addressed in the second NEAP. The

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[1] Earthdata.nasa.gov., 'A Black Cloud Over Cairo'. N.p., 2015. Web. 27 Apr. 2015. Retrieved from:-https://earthdata.nasa.gov/featured-stories/featured-research/black-cloud-over-cairo
*This phenomena that appears annually in September or October, at which time air pollution levels are more intense than the usual, typically exceeding ten times the limit set by the World Health Organization.

[2] EEPP Program Support Unit. (2000, June). The National Strategy for Integrated Municipal Solid Waste Management- A Framework for Action. Retrieved March 14, 2012, from National Resources Management and Development Portal:http://rmportal.net/library/content/tools/environmental-policy-and-institutional-strengthening-epiq-iqc/egyptian-environmental-policy-program-eepp-program-support-unit-psu-task-order-cd-vol-2/the-national-strategy-for-integrated-municipal-solid-waste-mana

[3] EEAA. (2009, September). Egypt State of Environment Report. Retrieved January 14, 2012, from Egyptian Environmental Affairs Agency(EEAA): http://www.eeaa.gov.eg/english/reports/SoE2009en/Egypt%20State%20of%20Environment%20Report.pdf

[4] *Comprehensive Environmental Analysis 1992-2002* (World Bank, Cairo, February 2005)

[5] The 2005 UN Common Country Assessment (CCA), 2005, p.76. Retrieved from *www.eg.undp.org/.../**egypt**/.../Common%20Country%20Report.pdf*

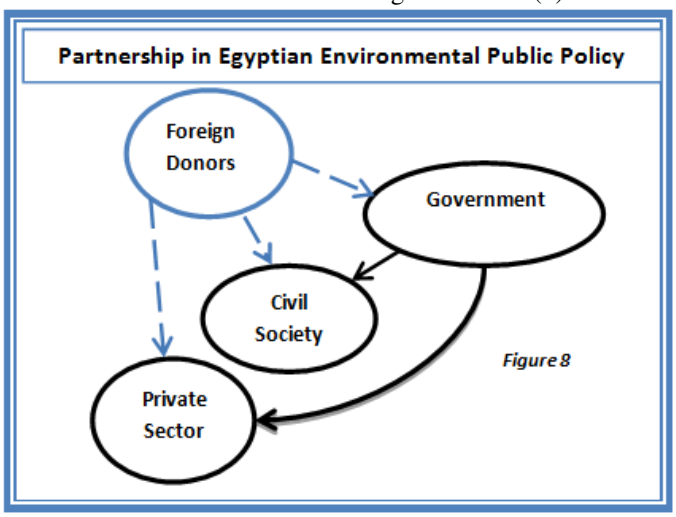
[6]Ministry of Environment official site, retrieved from:-http://www.eeaa.gov.eg/english/main/policies3.asp

final challenge is financing waste costs, which is presently dependent on the state budget and inadequate user-fee complements (residential apartments pay a monthly fee ranging between 1 and 10 L.E., the equivalent of 0.12 to 1.20 Euros, while commercial and industrial establishments pay a monthly fee ranging from 10 to 30 L.E., the equivalent of 1.15 to 3.45 Euros).[1]

This action plan is characterized by considering aspects that were not confronted in the first plan, such as involving stakeholders in costs, involving partners and the private sector, providing suitable land for landfill sites, raising public awareness, supporting recycling systems and the strict implementation of environmental legal regulations.[2]

The Private Sector, Civil Society and International Donors

It has been observed that international donors play an important role in environmental public policy making in Egypt. In reality, strategic involvement in the field of environmental protection is the result of coordinated cooperation between the Egyptian government and international agencies or direct cooperation between the civil society or the private sector and these organizations. These organizations include the World Bank, the Canadian International Development Agency (CIDA), the Danish International Development Agency (DANIDA), the European Investment Bank (EIB), the European Union (EU), the German Technical Cooperation (GTZ), the Japan Bank for International Cooperation (JBIC), the German Development Bank (KFW), the United Nations Economic and Social Commission for Western Asia (ESCWA), the United Nations Environment Program (UNEP), the United Nations Industrial Development Organization (UNIDO) and the United States Agency for International Development (USAID). The relationship between various environmental public policy partners and international donors is exhibited in figure number (8).



A good example of private, civil and international coordination in the field of environmental protection is CENACT. The acronym refers to the Community Environment Action Project funded by the Canadian International Development Agency. CENACT's purpose was to establish an effective system within Egypt for supporting community-level involvement in household and agricultural waste management, as envisioned under Egypt's National Environmental Action Plan. The system channels funds into a governorate-level coordinating body that selects, monitors and provides technical inputs to community-based NGOs – in Ismailia CENACT supports 8 NGOs that manage their community waste projects. These 8 NGOs are among a total of 14 NGOs working to improve the level of cleanliness and environmental pollution prevention in the Ismailia Governorate. Project activities led to income generation, increased employment and improved health through solid waste management initiatives. The main problems in such projects are inconsistency and concentration in urban areas, especially the city of Ismailia.[3]

CENACT's counterpart agency was the MSEA/EEAA.[4] The project worked at the operational level primarily with two of the ministry's agencies: the Environmental Protection Fund, which funds NGO initiatives, and the NGO Unit that was established to encourage broader civil society participation in environmental management. CENACT supported the enhancement of links between these national agencies with government

[1] EcoConServ Environmental Solutions, Egypt Solid Waste Overview, October 2012. P.14.
[2] SWEEPNET. (2010, July). Country report on the Solid Waste Management in Egypt. Retrieved January 24,2012, from The regional solid waste exchange of information and expertise network in Mashreq and Maghreb countries: http://www.sweep-net.org/ckfinder/userfiles/files/country-profiles/rapport-Egypte-en.pdf
[3] Environmental Action Plan, Ismailia Governorate, April 2008. P. 107-110.
[4] http://www.eeaa.gov.eg/epf/financial_support_program_2000_2001.htm#4

bodies at the regional and governorate levels (Regional Branch Offices, RBOs, and Environmental Management Units, EMUs). CENACT employed a participatory approach involving stakeholder information and consensus-building sessions. The project brought technical expertise to NGOs/CDAs (Community Development Associations) in the form of agricultural extension, business development, public awareness and outreach and health and organizational development.[1]

The Environmental Public Policy Cycle in Egypt:

a- The need for Integrated Solid Waste Management

Integrated Solid Waste Management, with a multi-dimensional view of SWM planning in which sustainable and coherent solutions to solid waste management problems are provided, is becoming a growing need worldwide.

The need is more crucial in developing countries, where the increase in the volume and types of wastes as a result of economic growth, urbanization and industrialization is becoming an escalating problem for national and local governments, making it challenging to ensure effective, sustainable waste management.[2]

Integrated waste management planning is a dynamic tool including aspects that range from policy-making and institutional development to the technical design of integrated solutions for the handling and disposal of waste.

The concept of ISWM differs significantly from the conventional approach towards waste management that seeks stakeholder participation, covering waste prevention and resource recovery, including interactions with other systems and promoting the integration of different habitat scales (city, neighbourhood, household). ISWM does not cope with waste management as a technical issue alone, but it also recognizes the importance of political and social factors. It also involves three elements: the stakeholders, the waste system and other fundamentals of the SWM system, each of which is of crucial importance and must be carefully considered during the Environmental Public Policy Planning Process. The latter fundamentals include health, financial-economic, socio-cultural, institutional, legal and political aspects.[3]

b- Public Policy Planning Process of SWM

SWM policy planning has a key role to play in achieving sustainable waste management. It aims to achieve the five basic steps/phases of public policy making, as follows:

1. **Policy Formation and Agenda setting:** This phase is initiated by collecting reliable data and other information on the existing waste situation for national, provincial or local governments or a specific industry and is a critical first step in compiling an integrated waste management plan. The aim of gathering this background information is to provide a realistic and quantitative basis for the development of the plan based on actual data and prioritized requirements and needs.
2. **Policy Formulation Stage:**

   Identifying the roles and responsibilities of key stakeholders is a must. When preparing an ISWM policy, attention shall be placed on ensuring that the roles and responsibilities of key stakeholders are clearly defined.

   i. *Identify the strengths and weaknesses of the current SWM system*: It is important to identify the true character of the current SWM system and establish its shortfalls, constraints and/or strong points. Problems may be characterized as either internal to the SWM system, such as lack of equipment or planning capacity, or external problems, such as uncontrolled urbanization or population explosions. The latter will generally have to be accepted and adapted to, while problems with internal and external dimensions such as accelerated waste generation and lack of co-ordination will generally require close cooperation with related sectors.

   ii. *Prepare the appropriate SWM future action plan*: This is the core of the planning procedure because it defines the actions to be implemented that will establish the new SWM system.

   iii. *Evaluating alternatives:* The evaluation of alternative SWM action policies through efficiently assessing costs versus benefits.
3. **Policy enactment stage (policy adoption)**, which comprises providing guidelines on how to pass from the planning phase to the implementation phase: It is crucial to ensure continuity between the planning process and the implementation. Therefore, the planning process should provide detailed guidance on performance measures and information management systems, both of which

[1] http://www.cowater.com/readProject.cfm?ID=60

[2] UNEP, 2009, 'Integrated Solid Waste Management-Training Manual', Vol. 1-4-Process to develop ISWM Plan, 5th November 2011, retrieved from: http://www.unep.or.jp/ietc/SPC/news-oct09/ Guidelines_ISWM_Plan.pdf.

3 UN-HABITAT, 2010, "Solid Waste Management in the World's Cities/Water & Sanitation in the World's Cities 2010", Malta.

should be used to monitor the performance of SWM systems and thus the implementation of the SWM policy.

4. **Policy Implementation:** This encompasses the authorization and funding of the government's program for SWM and the decision about which particular government agency will handle the execution of such plans.
   i. *Control of technological measures:* An outline of waste types ensures the identification of areas in which technological measures should be taken to eliminate or minimize certain types of waste.
   ii. *Outline of governance requirements*: SWM plans make way for the statement of financial, institutional and social requirements. On this basis, the need for future actions, such as investment in SWM plans, public awareness campaigns, training courses for the relevant authorities and so on may be determined.
5. **Policy analysis (program evaluation stage) and feedback:** Evaluations assess how well the SWM program is addressing, solving or at least mitigating the problem. In this stage, policy adopters weigh information about whether to continue, revise or terminate the policy.

Difficulties facing the implementation of the current Egyptian Environmental Public Policy Cycle:

In the following section, the challenges hindering the agenda setting and policy formulation, in addition to the financing and mobilization required for the implementation stage of the environmental public policy cycle in Egypt will be presented.

The first challenge is poorly structured environmental public policies, which stem from a general lack of accurate and comprehensive data in Egypt.[1] This, in turn, impedes the monitoring process essential for the formation and implementation stages and makes the evaluation phase almost impossible.

"Cultural constraints" are another factor that hinder both the agenda setting and implementation stages. The "lack of efficient human resources" in terms of environmental expertise is also one of the challenges facing environment public policy making in Egypt, especially in the implementation stage.[2]

The standardization of regulations and managing legal problems, in addition to the need to strengthen the institutional mechanisms necessary for effective environmental management, are also issues that may enhance the environment public policy making process in Egypt.[3] The problem here is not in the issuance of environmental legislation; the 2014 constitution ensures every person's right to a sound healthy environment and states that environmental protection is a national duty;[4] rather, the issue is ensuring compliance with and enforcement of these laws.[5]

Another major problem is the absence of any public policy directed to the optimal use of waste. The majority of municipal waste in Egypt is simply dumped (83.5%) due to the high generation rates and costs of recycling (only 2.5% of municipal waste in Egypt is recycled), while the remainder is landfilled (5%) or composted (9%). There is a significant and potentially utilizable organic content (56%) in the dumped waste amounts versus 13% plastic, 10% paper, 4% glass and 2% metal.[6]

Quantitative Analysis:-

Verifying the hypothesis:-

H1: The performance of the Suez Canal Governorates Environmental Affairs Agency is expected to have a strong significant positive relationship with the performance of the Suez Canal Governorates EAA in solid waste management.

Regression Model Analysis

A simple linear regression analysis used to investigate the effect of the performance of the Suez Canal Governorates Environmental Affairs Agency (x1) on the performance of the Suez Canal Governorates EAA in solid waste management (y). The results are listed below.

[1]Center for Economic and Social Rights, Factsheet no.13, Egypt, Retrieved from: *www.cesr.org/downloads/Egypt.Factsheet.web.pdf*

[2] Sowers, J. **Environmental Politics** in **Egypt: Activists, Experts**, and the **State,** Routledge, 2012, p.5-6.

[3] Sherif, Sherifa. 'Environmental Reform In Egypt: The Past Mistakes, Present Situation And Future Perspectives'. *Journal of Environment and Earth Science* 4.23 (2014): 195-201. Web. 29 Apr. 2015.

[4] The Egyptian Constitution, articles 29, 44, 45, 46 and 78, 2014.

[5] Ali, A. , Challenges facing the Environment, Arab Union for Sustainable Development and Environment, Retrieved from: http://www.ausde.org/?page_id=348. 30 Apr. 2015

[6] Ibid, EcoConServ, Environmental Solutions, P.10.

Model (1) service recipients

Model (1) evaluation

Table (1) Model(1) Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson Statistic
1	.865	.749	.748	.35518	1.771

b. Unless noted otherwise, statistics are based only on cases for which Service recipients.

As shown in the model summary (Table 1), the model coefficient of determination (R-square) is equal to 74.9%, which means that the performance of the Suez Canal Governorates Environmental Affairs Agency explains 74.9% of the variation in the performance of the Suez Canal Governorates EAA in solid waste management. These results support the relationship between the performance of the Suez Canal Governorates Environmental Affairs Agency and the performance of the Suez Canal Governorates EAA in solid waste management.

Table (2) ANOVA for Mode [b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	132.341	1	132.341	1.049E3	.000[a]
	Residual	44.405	352	.126		
	Total	176.746	353			

a. Predictors: (Constant), the performance of the Suez Canal Governorates Environmental Affairs Agency

b. Dependent Variable: the performance of the Suez Canal Governorates EAA in solid waste management.

The ANOVA (Table 2), which assesses the overall statistical significance of the model, revealed that model (1) is significant with a p-value < 0.05 (Healey, 2009)[1].

Table (3) Coefficients table for Model (1) [a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.453	.068		6.641	.000
The performance of the Suez Canal Governorates ironmental Affairs Agency	.847	.026	.865	32.389	.000

a. Dependent Variable: the performance of the Suez Canal Governorates EAA in solid waste management

A simple regression equation is created from the "Unstandardized Coefficients" in the coefficients table (Table 3). The Standardized Beta Coefficients provide a measure of the contribution of the independent variable to the model. Because the p-values (0.0) is less than 0.05, it is revealed that the performance of the Suez Canal Governorates Environmental Affairs Agency makes a significant contribution to the prediction of the performance of the Suez Canal Governorates EAA in solid waste management.

Checking model (1) assumptions

With respect to the assumption of independence of the residuals regarding residuals distribution, Durbin-Watson and normality tests were performed. The results showed that the Durbin-Watson computed value was 1.771, while the table upper limit value at 5% significance is DU=1.699 and the lower limit is 1.688.[2] In other words, the computed value is between the two tabulated values (DU and 4-DU), implying that autocorrelation is not an issue. Moreover, the following figure shows the normal p-plot of the residuals

[1] Healy, M., *Developing undergraduate research and inquiry*. York: HE Academy, 2009.
[2]Freund et.al, Regression Analysis Study Guide, *Elsevier Science Publishing Co Inc.,* 2006,p.9.

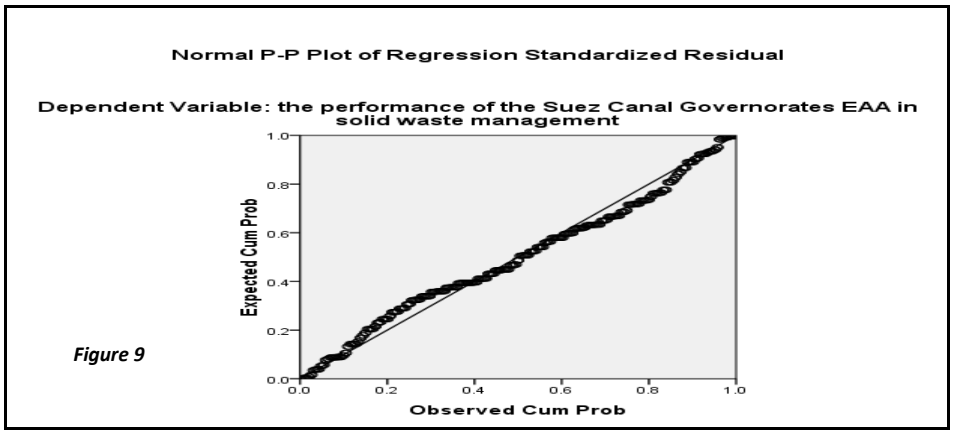


Figure 9

Figure (9) shows that the residuals have a standard normal distribution with a mean zero and standard deviation of 1.

Model (1) discussion

Finally, a simple linear regression is calculated that predicts y based on x_1. A significant regression equation was found (F (1, 352), $p < 0.05$), with an R-square of 74.9 % and R = 0.865. These results provide empirical evidence verifying the hypothesis (H1), which supports that the performance of the Suez Canal Governorates Environmental Affairs Agency has a significant positive relationship with the performance of the Suez Canal Governorates EAA in solid waste management.

Model (2) service providers

Model (2) evaluation

Table (4) Model(2) Summary [b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.296[a]	.088	.071	.33669	2.201

a. Predictors: (Constant), the performance of the Suez Canal Governorates Environmental Affairs Agency EAA

b. Dependent Variable: performance of the Suez Canal Governorates EAA in solid waste management

As shown in the model summary (Table 4), the model coefficient of determination (R-square) is equal to 8.8%, which means that the performance of the Suez Canal Governorates Environmental Affairs Agency explains 8.8% only of the variation in the performance of the Suez Canal Governorates EAA in solid waste management. These results support the weak relationship between the performance of the Suez Canal Governorates Environmental Affairs Agency and the performance of the Suez Canal Governorates EAA in solid waste management among the service providers.

Table (5) ANOVA for Model (2) [b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.589	1	.589	5.197	.027[a]
	Residual	6.121	54	.113		
	Total	6.711	55			

a. Predictors: (Constant), the performance of the Suez Canal Governorates Environmental Affairs Agency EAA

b. Dependent Variable: performance of the Suez Canal Governorates EAA in solid waste management

The ANOVA (Table 5), which assesses the overall statistical significance of the model, revealed that model (2) is significant at p-value < 0.05 (Healey, 2009).

Table (6) Coefficients table for Model (2) [a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	2.141	.428		5.002	.000
The performance of the Suez Canal Governorates Environmental Affairs Agency (EAA)	.310	.136	.296	2.280	.027

a. Dependent Variable: performance of the Suez Canal Governorates EAA in solid waste management

The simple regression equation is created from the "Unstandardized Coefficients" in the coefficients table (Table 6). The standardized beta coefficients provide a measure of the contribution of the independent variable to the model. Because the p-values (0.027) are less than 0.05, it is revealed that the performance of the Suez Canal Governorates Environmental Affairs Agency makes a weak but significant contribution to the prediction of the performance of the Suez Canal Governorates EAA in solid waste management.

Checking model (1) assumptions

With respect to the assumption of independence of the residuals regarding residuals distribution, Durbin-Watson and normality tests were performed. The results showed that the Durbin-Watson computed value was 2.201, while the table upper limit value at 5% significance is DU=1.699 and the lower limit is 1.688.[1] In other words, the computed value is between the two tabulated values (DU and 4-DU), implying that autocorrelation is not an issue. Moreover, the following figure shows the normal p-plot of the residuals.

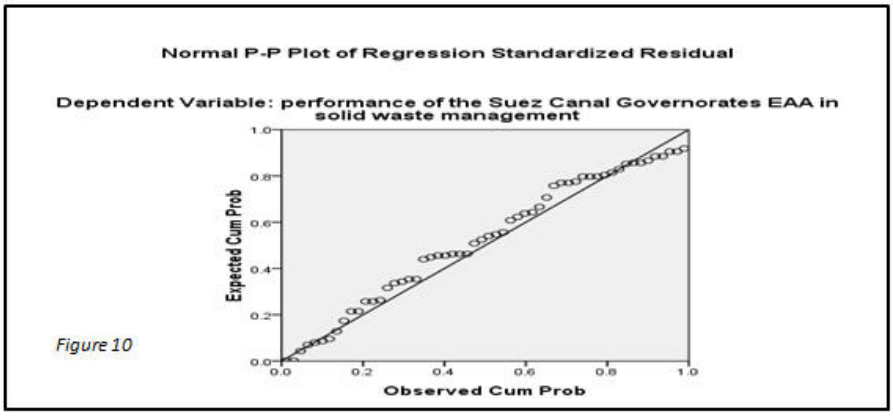


Figure (10) shows that the residuals converge to the standard normal distribution with a mean of zero and standard deviation of 1.

Model (2) discussion

Finally, a simple linear regression is calculated that predicts y based on x_1. A significant regression equation was found (F (1, 54), $p < 0.05$), with an R-square of 8.8 % and R = 0.296. These results provide empirical evidence verifying the hypothesis (H1), which supports that the performance of the Suez Canal Governorates Environmental Affairs Agency has a weak but significant positive relationship with the performance of the Suez Canal Governorates EAA in solid waste management.

Comparison between service recipients and service providers:

A T-test was performed to test the difference between service recipients and service providers in evaluating Environmental Public Policy in Egypt with respect to Solid Waste Management;[2] the results are listed as shown in figure 11.

[1] Ibid, p.12.
[2] Lind, D et.al, Basic Statistics for Business and Economics, *McGraw-Hill Ryerson Higher Education,* 2010.

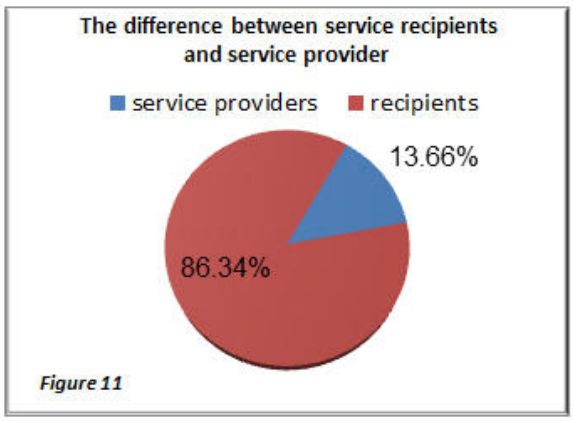


Figure 11

Table (7) Levene's Test for Equality of Variances

F	Sig.
13.143	0.0

Table (7) shows the equality of variance test (Levene); because the sig is less than α=0.05, we can use the t-test in the case of unequal variance as follows:

Table (8) t-test

t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
8.97	408	0.0	0.5381	0.0599

Table (8) shows the results of the T-test testing the difference between service recipients and service provider on the role of the performance of the Suez Canal Governorates EAA in solid waste management

Because the sig= (0.0), which is less than α=0.05, we can conclude that there is a significant difference between service recipients and service providers in the performance of the Suez Canal Governorates EAA in solid waste management. We can further conclude that the performance of the service providers of the Suez Canal Governorates EAA in solid waste management exceeds that of the recipients.

RESULTS AND DISCUSSION

Introduction

This section aims to explore the results of the investigation of the relationship between the performance of the Suez Canal Governorates Environmental Affairs Agency and its performance with regards to solid waste management.

The population and surveyed sample

The respondent or study population is divided into two main classes. The first respondents are those who represent the formal service providers, or the EEAA, and the informal providers represented by a number of NGOs that are working in the field of environmental issues in the Canal governorates. The second group comprises service recipients, specifically university students living in the Suez Canal region. Students were surveyed in an attempt to gauge the level of students' understanding and awareness of environmental problems and level of participation in different activities to reduce environmental problems in general and solid waste management in particular. Due to the limited sampling, caution should be used when generalizing results.

The sampling tables used to determine the sample size (379)[1] corresponded to a population of 24,000 students.

Pilot Test and Survey Respondents

Three hundred and fifty four survey questionnaires were returned, representing a 93.4% response rate. The goodness and validity of the response data are found by conducting a reliability test using Cronbach's alpha.[2] SPSS reliability analysis was performed separately for the indicators of each scale (Table 9).

[1] Sekaran, U., Research Methods for Business. A skill building approach, (3rd Ed.), *New York: Wiley*, 2000.
[2] Sekaran, U., Research Methods for Business (4th Ed.), *Hoboken, NJ: John Wiley & Sons*, 2003, p.327.

Table (9) – Reliability analysis for service recipients

Scale	No. of indicators	Cronbach's alpha
Evaluating the performance of the Suez Canal Governorates Environmental Affairs Agency (EAA) in the environmental public policy making process in Egypt.	17	0.937
- Evaluate the performance of the Suez Canal Governorates EAA in solid waste management	12	0.920

Table (10) – Reliability analysis for service providers

Scale	No. of indicators	Cronbach's alpha
Evaluating the performance of the Suez Canal Governorates Environmental Affairs Agency (EAA) in the Environmental public policy making process in Egypt.	17	0.796
- Evaluate the performance of the Suez Canal Governorates EAA in solid waste management	12	0.719

Generally, reliability coefficients (Cronbach's alpha) of 0.6 or higher are considered adequate.[1] As illustrated in Table (9) and Table (10), because the overall calculated reliability coefficients for Cronbach's alpha values range from 0.719 to 0.937, all variables included in the study are reliable.

Data analysis methods

Descriptive analysis

To investigate the feel of the measured data, basic descriptive statistics were calculated to ensure that the distortion of the questionnaire responses outputs was negligible. The descriptive analysis results illustrated that the standard deviation is fairly small, which revealed that there is only a weak distortion of the collected data for all variables. These results imply the homogeneity of the surveyed sample.

1- Service recipients (Appendix I) descriptive analysis:
   - i- A total of 61.13% of the sample strongly agrees that the Suez Canal Governorates Environmental Affairs Agency prepares environmental studies and maps to be used in the making of Environmental Public Policies, followed by 56.05% who agree that the Suez Canal Governorates EAA provides technical support to government bodies and organizations. Another 53.33% agree that it provides financial support to local governmental bodies that assist in environmental protection planning. Only 45.42% of the sample believes that the Suez Canal Governorates EAA receives complaints from individuals and institutions as well as governmental and non-governmental organizations and takes the necessary action, while 45.99% think that the Suez Canal Governorates EAA performs its job with the help of environmental directorates in the governorates.
   - ii- A total of 56.72% of the sample strongly agrees that the Suez Canal Governorates EAA participates with local bodies in garbage collection and 55.59% believe that it contributes to the management of hazardous substances, wastes and residues in coordination with the responsible local authorities. The sample was almost evenly divided between the 46.89% who think that the Suez Canal Governorates EAA does not play any role in solid waste management and the 48.93% who believe that the Suez Canal Governorates EAA superintends local bodies in allocating places for handling and treating (managing waste) garbage and solid waste, as well as verifying those bodies' compliance with environmental specifications.

2- Service providers (Appendix II), descriptive analysis:
   - i. Similar to the recipients, 76.43% of the sample strongly agrees that the Suez Canal Governorates Environmental Affairs Agency prepares environmental studies and maps to be used in the making of environmental public policy, followed by 70.71% that believe the Suez Canal Governorates EAA provides technical support to local governmental bodies that assist in environmental protection planning. Further, 70% think it provides financial support to local governmental bodies that assist in environmental protection planning. Additionally, 52.86% agree that the Suez Canal Governorates EAA performs its job alone without partnerships, while only 45.71% agree that the Suez Canal Governorates EAA is able to identify types of environmental disasters that are likely to occur and the best means of containment.
   - ii. A total of 76.79% of the sample strongly agrees that the Suez Canal Governorates EAA

[1] Ibid, p.327-336.

contributes to the management of hazardous substances, wastes and residues in coordination with the responsible local authorities, and 71.43% strongly agree that it contributes to the management of hazardous substances, wastes and residues in coordination with the civil society (NGO's) and the private sector. Further, 55.71% of the sample strongly agrees that the Suez Canal Governorates EAA participates with local bodies in transferring garbage to environmentally safe places and 55% believe that it superintends local bodies in allocating places for burning garbage and solid waste, as well as verifying local bodies' compliance with environmental specifications.

Conclusion and recommendations:-

After investigating environmental public policy in Egypt with an emphasis on solid waste management using both qualitative and quantitative analysis, it can be concluded that the performance of the Suez Canal Governorates Environmental Affairs Agency has a weak but significant positive relationship with the performance of the Suez Canal Governorates EAA in solid waste management. This is due to four factors: shortcomings within the environmental public policy making process; shortcomings within Egyptian societal practices and culture; shortcomings within the Egyptian legal framework; and shortcomings related to sustainability.

First, with regard to the public policy making process, ill structured, inconsistent and intermittent environmental public policies built on a "lack of comprehensive data" impede the monitoring process essential for the formation and implementation stages of policy making, rendering the evaluation phase almost impossible.

Second, regarding shortcomings within Egyptian societal practices and culture, "cultural constraints" hinders both the agenda setting and implementation stages. The "lack of efficient human resources" applies to individuals with environmental expertise as well as to a general lack of knowledge regarding to environmental issues and solid waste management in particular.

Third, with regard to shortcomings within the Egyptian legal framework, the problem is not the issuance of laws but the need standardized environmental regulations and the ability to ensure compliance with and enforcement of these laws.

Fourth, with regard to shortcomings related to sustainability, the main problem is the reliance on international donors to place certain policies on the agenda, which, in turn, affects public policy formulation (assessing and evaluating alternatives), thus hindering the sustainability of environmental public policies and making long term commitments to certain policies impossible due to the dependence on sporadic and intermittent funds provided by international donors.

These drawbacks and obstacles must be avoided in the future if Egypt's environment is to be preserved and protected. To achieve that, this study makes several recommendations for policy makers in the Ministry of State for Environmental Affairs (MSEA) so that they may play an effective role in environmental protection and solid waste management. The Egyptian Environment Affairs Agency (EEAA) in general and the Suez Canal governorates EAA in particular should be less dependent on international donors when shaping Egyptian environmental public policies to ensure the persistence of such policies and guarantee the completion and consistency of the environmental public policy cycle. Moreover, a public awareness program using media is a must. The media in general, with a special emphasis on television, especially drama, could become an active partner in the protection of the environment due to its vital role in introducing new positive environmental habits due to its significant influence on Egyptian public behaviour.

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Appendix I

Recipients

I: - Evaluating the performance of the Suez Canal Governorates Environmental Affairs Agency (EAA) in the Environmental Public Policy Making Process in Egypt

#	Statement	mean	standard deviation	cv%	agreement proportion %	rank
1	The Suez Canal Governorates EAA prepares environmental studies and maps to be used in the making of environmental public policies	3.06	1.15	37.63%	61.13%	1
2	The Suez Canal Governorates EAA provides financial support to local governmental bodies that assist in environmental protection planning	2.67	1.04	39.04%	53.33%	3
3	The Suez Canal Governorates EAA provides technical support to local governmental bodies that assist in environmental protection planning	2.55	1.02	40.05%	50.96%	4
4	The Suez Canal Governorates EAA oversees the implementation of standards and requirements in accordance with the provisions of Law No. 4 of 1994	2.48	0.99	39.82%	49.60%	7
5	The Suez Canal Governorates EAA monitors environmental compliance in facilities that were approved by the EEA and checks their adjustments	2.52	1.05	41.63%	50.40%	6
6	The Suez Canal Governorates EAA assesses the environmental impact of facilities and approves them	2.47	1.04	42.16%	49.49%	8
7	The Suez Canal Governorates EAA identifies types of environmental disasters that are likely to occur and the means of containment.	2.47	1.05	42.47%	49.38%	9

8	The Suez Canal Governorates EAA recognizes qualified experts who may assist in the planning and implementation of governorates' environmental programs.	2.44	0.99	40.40%	48.81%	11
9	The Suez Canal Governorates EAA implements the Environmental Training Plan (environmental awareness programs) for citizens in light of the state's policy for environmental affairs	2.42	1.07	44.05%	48.47%	12
10	The Suez Canal Governorates EAA promotes environmental awareness in the governorates	2.35	1.02	43.24%	47.01%	15
11	The Suez Canal Governorates EAA coordinates efforts between the people and environmental Affairs offices	2.36	1.03	43.80%	47.23%	14
12	The Suez Canal Governorates EAA receives complaints from individuals and institutions as well as governmental and non-governmental organizations and takes the necessary action.	2.27	1.03	45.32%	45.42%	17
13	The Suez Canal Governorates EAA provides technical support to government bodies and organizations	2.80	0.98	34.82%	56.05%	2
14	The Suez Canal Governorates EAA performs its job alone without partnerships	2.54	1.02	40.03%	50.73%	5
15	The Suez Canal Governorates EAA performs its job with the help of civil society (non-governmental organizations)	2.46	0.96	38.97%	49.15%	10
16	The Suez Canal Governorates EAA performs its job with the help of international donors performs its job	2.42	1.01	41.65%	48.36%	13
17	The Suez Canal Governorates EAA performs its job with the help of environmental directorates in the governorates	2.30	0.96	41.81%	45.99%	16

II: - Evaluate the performance of the Suez Canal Governorates EAA in solid waste management

#	Statement	mean	standard deviation	cv%	agreement proportion %	rank
1	The Suez Canal Governorates EAA contributes to the management of hazardous substances, wastes and residues in coordination with the responsible local authorities	2.78	1.05	37.95%	55.59%	2
2	The Suez Canal Governorates EAA contributes to the management of hazardous substances, wastes and residues in coordination with civil society (NGOs) and the private sector	2.62	0.98	37.50%	52.32%	4
3	The Suez Canal Governorates EAA contributes to the management of hazardous substances, wastes and residues in coordination with international donors.	2.54	1.02	40.03%	50.73%	7
4	The Suez Canal Governorates EAA superintends local bodies' implementation of the commitment to allocate places for disposing of garbage and solid waste as well as verifying their compliance with environmental specifications	2.52	0.94	37.33%	50.40%	8
5	The Suez Canal Governorates EAA superintends local bodies' implementation of the commitment to allocate places for handling and treating (managing waste) garbage and solid waste as well as verifying their compliance with environmental specifications	2.45	0.93	38.15%	48.93%	11
6	The Suez Canal Governorates EAA superintends local bodies' implementation of the commitment to allocate places for burning garbage and solid waste as well as verifying their compliance with environmental specifications	2.47	0.96	38.97%	49.49%	10
7	The Suez Canal Governorates EAA works with local bodies in garbage collection	2.84	0.96	34.01%	56.72%	1
8	The Suez Canal Governorates EAA works with local bodies in garbage collection	2.71	0.99	36.43%	54.24%	3
9	The Suez Canal Governorates EAA works with local bodies in transferring garbage to environmentally safe places	2.56	0.91	35.64%	51.30%	5
10	The Suez Canal Governorates EAA works with local bodies in transferring solid waste to environmentally safe places	2.50	0.95	37.92%	49.94%	9
11	The Suez Canal Governorates EAA oversees the implementation of internationally funded environmental projects in the field of solid waste management.	2.56	0.97	38.08%	51.19%	6
12	The Suez Canal Governorates EAA does not play any role in solid waste management	2.34	0.96	41.11%	46.89%	12

Appendix II

Service providers

I: - Evaluating the performance of the Suez Canal Governorates Environmental Affairs Agency (EAA) in the Environmental Public Policy Making Process in Egypt

#	Statement	mean	standard deviation	cv%	agreement proportion %	rank
1	The Suez Canal Governorates EAA prepares environmental studies and maps to be used in the making of environmental public policies	3.82	0.90	23.46%	76.43%	1
2	The Suez Canal Governorates EAA provides financial support to local governmental bodies that assist in environmental protection planning	3.50	1.10	31.30%	70.00%	3
3	The Suez Canal Governorates EAA provides technical support to local governmental bodies that assist in environmental protection planning	3.54	0.93	26.40%	70.71%	2
4	The Suez Canal Governorates EAA oversees to the implementation of standards and requirements in accordance with the provisions of Law No. 4 of 1994	3.27	1.10	33.77%	65.36%	6
5	The Suez Canal Governorates EAA monitors environmental compliance in facilities that were approved by the EEA and checks their adjustments	2.88	0.83	28.96%	57.50%	14
6	The Suez Canal Governorates EAA assesses the environmental impact of facilities and approves them	2.84	0.99	34.75%	56.79%	15
7	The Suez Canal Governorates EAA identifies types of environmental disasters that are likely to occur and the means of containment.	2.29	1.02	44.71%	45.71%	17
8	The Suez Canal Governorates EAA recognizes qualified experts who may assist in the planning and implementation of governorates' environmental programs.	3.07	0.93	30.33%	61.43%	9
9	The Suez Canal Governorates EAA implements the Environmental Training Plan (environmental awareness programs) for citizens in light of the state's policy for environmental affairs	2.96	1.19	40.16%	59.29%	11
10	The Suez Canal Governorates EAA promotes environmental awareness in the governorates	2.98	1.14	38.09%	59.64%	10
11	The Suez Canal Governorates EAA coordinates efforts between the people and environmental affairs offices	3.16	1.04	32.92%	63.21%	7
12	The Suez Canal Governorates EAA receives complaints from individuals and institutions as well as governmental and non-governmental organizations and takes the necessary action.	2.93	1.11	37.89%	58.57%	12
13	The Suez Canal Governorates EAA provides technical support to government bodies and organizations	3.46	1.03	29.62%	69.29%	4
14	The Suez Canal Governorates EAA performs its job alone without partnership	2.64	1.02	38.47%	52.86%	16
15	The Suez Canal Governorates EAA performs its job with the help of civil society (non-governmental organizations)	3.45	0.99	28.71%	68.93%	5
16	The Suez Canal Governorates EAA performs its job with the help of international donors	3.13	0.85	27.33%	62.50%	8
17	The Suez Canal Governorates EAA performs its job with the help of environmental directorates in the governorates	2.89	1.00	34.68%	57.86%	13

II: - Evaluate the performance of the Suez Canal Governorates EAA in solid waste management

#	Statement	mean	standard deviation	cv%	agreement proportion %	Rank
1	The Suez Canal Governorates EAA contributes to the management of hazardous substances, wastes and residues in coordination with the responsible local authorities	3.84	0.93	24.22%	76.79%	1
2	The Suez Canal Governorates EAA contributes to the management of hazardous substances, wastes and residues in coordination with the civil society (NGOs) and the private sector	3.57	1.02	28.68%	71.43%	2
3	The Suez Canal Governorates EAA contributes to the management of hazardous substances, wastes and residues in coordination with international donors.	3.23	0.85	26.38%	64.64%	4
4	The Suez Canal Governorates EAA superintends local bodies implementation of the commitment to allocate places for disposing of garbage and solid waste as well as verifying their compliance with environmental specifications	3.05	1.09	35.56%	61.07%	7
5	The Suez Canal Governorates EAA superintends local bodies implementation of the commitment to allocate places for handling and treating (managing waste) garbage and solid waste as well as verifying their compliance with environmental specifications	2.89	1.00	34.68%	57.86%	10
6	The Suez Canal Governorates EAA superintends local bodies implementation of the commitment to allocate places for burning garbage and solid waste as well as verifying their compliance with environmental specifications	2.75	0.98	35.53%	55.00%	12
7	The Suez Canal Governorates EAA works with local bodies in garbage collection	3.13	1.13	36.13%	62.50%	5
8	The Suez Canal Governorates EAA works with local bodies in garbage collection	3.25	0.92	28.29%	65.00%	3
9	The Suez Canal Governorates EAA works with local bodies in transferring garbage to environmentally safe places	2.79	0.95	34.03%	55.71%	11
10	The Suez Canal Governorates EAA works with local bodies in transferring solid waste to environmentally safe places	2.98	0.98	32.91%	59.64%	8
11	The Suez Canal Governorates EAA oversees the implementation of internationally funded environmental projects in the field of solid waste management.	3.05	0.94	30.86%	61.07%	6
12	The Suez Canal Governorates EAA does not play any role in solid waste management	2.95	1.26	42.65%	58.93%	9

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