

Strategic Environmental Assessment (SEA) Criteria formulation; The Egyptian Case Study

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Abstract

This paper discusses the importance of formulating the Strategic Environmental Assessment (SEA) criteria to achieve sustainable development goals announced by the United Nations (UN-SDGs) and was ratified by Egypt. The study focuses on how to reach a suitable SEA that is applicable on the Egyptian situation. The current environmental assessment in Egypt is made by the "environmental impact assessment (EIA)" which is carried out at the project level without policies, plans and programs. This EIA does not fall within the formulation of policies, plans and programs at the national, regional and provincial levels, nor at the levels of local planning and development

This research paper examined some international case studies to verify the criteria used in SEA. Then selecting the appropriate criteria for the Egyptian situation after analyzing the case studies then making a questionnaire to collect experts' point of views and analyze them. Finally presenting the SEA criteria.

The research completed an innovative methodology presentation and achieved the objectives of the formulation of the SEA criteria to be applied on the Egyptian situation. Thus, the research achieved a scientific addition through reaching the SEA criteria at all planning levels

Keywords: Strategic Environmental Assessment- Criteria- Egypt- Sustainable development – Environmental impact assessment

INTRODUCTION

The Strategic Environmental Assessment (SEA) is an effective mechanism for integrating environmental considerations into development policies, plans and programs, leading to protecting the environment and promoting rational management of natural resources. This process takes into account the cumulative environmental impacts of the proposed development projects at an early stage of the decision-making process[1]

For the Egyptian case, the environmental impact assessment has been implemented since 1994 in accordance with the Egyptian Environment Law No. 4 of 1994 and its

amendment No. 9 of 2009, but it faces many challenges such as weak cumulative environmental impact assessment, And the Irregularity of the follow-up program and environmental monitoring, especially after the environmental license of the Project is made, and the high level of probability that the development policies or programs will have long-term negative environmental impacts that may affect the achievement of sustainable development.

Based on the SEA criteria, these criteria are categorized into a set of basic criteria: political will, legal mandate, and capacity of environmental institutions, implementation of Strategic Environmental Assessment, education and environmental awareness, and finally social recognition and the role of civil society[2]. Each of these criteria contains indicators and evidence that maximizes the environmental conservation process as one of the most important aspects of sustainability, as well as the achievement of the United Nations sustainable development goals (SDGs) 2030[3]. Despite of the importance of the process of SEA at present, it is not recognized within the official texts in the Egyptian environmental legislation, as the application of the SEA achieves the sustainable development of natural and human resources.

RESEAECH OBJECTIVESAND METHODOLOGY

Research Objectives :

1. Defining the importance of the SEA.
2. Introducing the SEA dimensions and factors.
3. Formulation of SEA criteria and their application requirements.
4. Applying the criteria of SEA on the Egyptian situation.

Research Methodology:

This paper presents several definitions of SEA concepts and its importance using the inductive method then it explains the dimensions and factors of SEA by using the analytical approach. Finally, it analyzes the SEA criteria through the experts' questionnaire using the comparative analytical method and concluding the final criteria suits application in Egypt using deductive method.

STRATEGIC ENVIRONMENTAL ASSESSMENT CONCEPT AND DEFINITION

The concept of SEA can be formulated in legal and scientific framework. Legally Environment Law No. 4 / 2004 does not include a SEA definition, it only requires the environmental impact assessment EIA defined as "Studying and analyzing the environmental feasibility of proposed projects, whose construction or activities might affect the safety of the environment in order to protect it".[4]

There are many definitions for SEA. Analyzing such concepts and definitions concluded that the concept of SEA can be formulated as "**A methodological comprehensive process of SEA of policies, plans and programs to guide sustainable development through its integrating in decision-making and environmental awareness assessment in the closest appropriate stage emphasizing the importance of a high degree of transparency.**

IMPORTANCE OF STRATEGIC ENVIRONMENTAL ASSESSMENT

The importance of SEA was examined through study and analysis wide range of literature. Hence, the importance of SEA in this paper is summarized as follows:

1. Helps integrate the sustainability principles into policy-making as it impacts and improves decision-making and contributes to the creation of an environmentally sustainable integrated framework for policy, plan and program development.
2. Provides the best framework for cumulative impact assessment where early warning of cumulative effects and large-scale changes.[5]
3. Helps to meet the development challenges that will be achieved to incorporate them into early vision as an input to the planning process.
4. Discusses development choices and provides directions for sustainable development
5. Ensures a democratic process of decision-making and transparency by informing planners, citizens and decision-makers about sustainability issues
6. Encourage political will and urge change of culture to take strategic decision[6]
7. SEA gives an environmental importance similar to that which is given to other aspects of development in the decision-making process.
8. Achieves community dialogue on environmental aspects among many organizations that are usually involved in policy formulation, plans, and programs, and provides an opportunity to identify the public's views on future developments that warn from potential environmental impacts.[7]

DIMENSIONS AND FACTORS OF STRATEGIC ENVIRONMENTAL ASSESSMENT

In the previous studies, the dimensions and factors of SEA were mentioned. They are the initial principles for the formulation of the SEA criteria by this paper. from the identification to some studies mentioned in The study, (Towards SEA for the developing nations of Asia) made by the research project at Singapore University examined seven dimensions for the SEA and tested their application on six countries (Hong Kong-Singapore - Malaysia - Philippines - Sri Lanka - Vietnam) (Briffett, 2003)[8], and A University of Liverpool researcher (Hegazy, 2010).[9]

They mentioned five main dimension and factors which are (Political will, Legal mandate, Environmental Institutional capacity, Technical knowhow, Process implementation of SEA),

And after examining the factors on the Egyptian case by Hegazy, I. The learning, awareness and community knowledge was merged to be Environmental education and awareness.

Suggesting a detailed view of the main factors made by experts:

The most important results of this study after testing those dimensions on the six countries were concluded in the possibility of adopting the SEA in the future because of the global movement towards environmental awareness and environmental importance reflected in all the studied countries. This is particularly confirmed by the increasing commitment of industry in these countries to environmental management systems, the proliferation of environmental NGOs, and improving government participation in sustainability concepts.

An increasing number of government officials, academics and practitioners in the study area are aware of SEA and sustainability as a policy option, but there is a problem concerning the lack of sufficient strength and influence on all sectors, ministries and departments to achieve effective implementation of the SEA in the application stage.

Hegazy, I. examined the factors mentioned above on the Egyptian case by working out a questionnaire of a group of experts on their views on these factors, and the result was suggesting a detailed view of the main factors made by experts:

- Regarding the **political will factor**, expert's opinions revolve around the importance of strong political support and its impact on the decision-making process and consider the environmental factors as one of the most important factors in the adoption of the SEA in Egypt. They agreed on the importance of the environmental policy with clear goals leading to the adjustment of planning processes and related mandates to achieve these goals, because the environmental policy in Egypt has a decreased relative weight in the formulation of policies, plans and programs

- **Legal mandate**, experts opinions that the law is considered an important support, not only for the adoption of SEA but also for the implementation of its results, many experts in the interviews and especially decision makers argued about the importance of putting mandatory provisions for decision makers to apply SEA, and most experts agreed that the recent Egyptian Environmental Law is an appropriate legal mandate to support the adoption of SEA, and they consider that the Environment Law no. 4 to the year 1994 dealt with the legal framework for environmental protection. Experts suggested that there should be a coordination between different departments because there is a dispersion of responsibilities between various authorities, also specifying the inspection authority with a clear responsibility to enforce the law and to report any violation of its provisions to apply its implementation procedures effectively.
- **Environmental institutions' capacity**, most respondents believe that there is an integrated system and clear responsibilities for those involved in planning and SEA to manage environmental issues
- **Environmental Education and Awareness**, most experts agreed on the importance of environmental education and awareness to change the current situation. Therefore, there is a need for environmental education and awareness for SEA actors to understand its importance and increase environmental awareness of decision makers.
- **SEA implementation**, most experts have agreed that public participation in the discussion of key issues affecting SEA in Egypt is inadequate.
- **Technical know-how**, most respondents believe that supporting the training field act to increase staff skills is an important key for effective implementation of SEA.

INITIAL FORMULATION OF SEA CRITERIA

The research has introduced and analyzed all dimensions and factors for the formulation of SEA criteria and the elaboration of its dimensions and factors, through the specified opinions of experts in the formulation of SEA standards. These criteria are in six main criteria and 23 sub-criteria identified in Table 1 Formulation of SEA criteria.

Table 1: Formulation of SEA criteria.

Main criteria		Sub- criteria
1	Political will	<ul style="list-style-type: none"> - Presence of an environmental policy and an environmental plan for applying SEA in Egypt - Degree of enclosure of the environmental issues at the strategic level in Egypt - Existence of a national environmental charter in Egypt to implement the SEA in Egypt
2	Legal obligations	<ul style="list-style-type: none"> - Enclosure of SEA in the environmental law of Egypt - Mandating SEA in Egypt legislation
3	Environmental institutions capacity	There is a specific institutional structure for environmental officials that includes: <ul style="list-style-type: none"> - The presence of Ministry of Environment - The existence of an environmental affairs agency - The presence of representatives of Ministry of Environment at the regional and local levels Availability of expertise responsible for managing environmental issues
4	SEA implementation	<ul style="list-style-type: none"> - Requirements for SEA include: Screening, Scoping, Appraisal of alternative, Environmental report, Consultations, Decision Making, Information on the decision, Monitoring[10] - The existence of professional associations of experts concerned with environmental assessments - Conduct regular training sessions to raise environmental awareness
5	Environmental education and awareness	<ul style="list-style-type: none"> - Incorporate awareness of environmental issues into the formal education system at different stages and levels of education - Spread environmental awareness among public
6	Social recognition and the role of civil society criterion	<ul style="list-style-type: none"> - Mandating public participation in the preparation of the SEA study - Consult with environmental NGOs when formulating policies, plans and programs

Table 2: Classification of experts and their distribution rates

Classification of experts	Institutions	Reasons for selection	No.	%
Academic, experts and consultants	Faculty of Engineering-Cairo University, National Housing and Building Research Center, Faculty of Regional and Urban Planning, Desert Research Center, Institute of Environmental Studies and Research – In a Shams University	Due to the recent idea of the of SEA criteria, there is need for the academic support, and consultants who will help in the formation of the planning study leading to the design steps for large projects and the extent of their consideration to SEA	11	30,6
Executive experts	New Urban Communities Authority - Ministry of Planning	Because they implement different projects in all sectors considering the environmental dimension, and thus the theoretical dimension is linked to the operational	12	33,3
Decision makers	Environmental Affairs Agency-General Organization for Physical Planning (GOPP) - General Authority for Industrial Development	Through which the appropriate decision is taken to implement various types of projects, as they include environmental assessment in the projects	13	36,1
Total			36	100

The previous criteria were examined in the questionnaire form and consult the experts to implement these standards in Egypt and reach the finalization of the standards.

QUESTIONNAIRE ON STRATEGIC ENVIRONMENTAL ASSESSMENT CRITERIA

A questionnaire was prepared to explore the expert's views in the proposed criteria for the applicability of SEA in Egypt, which deduced from previous studies and researchers analysis. Due to the uncertainty of the SEA phenomenon structured interviews were conducted with two groups of experts using the Delphi technique[11]

Selection of questionnaire expert's and classification

Three groups of experts were selected and interviewed to obtain SEA criteria. The first group consists of academics and consultants; the second group consists of executives; the third group consists of decision makers. Table 2 shows the classification of experts and reasons for selecting them and their distribution ratios.

Explanation of the two rounds conclusions

The first round aimed to survey the experts' opinions on the content of the questionnaire and its components. A preliminary study was conducted to test the questionnaire through interviews with group of experts in different disciplines. During the first round of the test, suggestions were made by the experts to amend the wording of some questions and clarify some of

them. Then the questions were modified for finalizing the questionnaire form to process the second round.

The second round aims to complete the questionnaire sample after modifying the form and conducting interviews with experts from different parties as mentioned in the previous table.

Analyzing responses using SPSS programs

Expert's opinions were analyzed using SPSS program using the cross-tabulation table and figures indicating the number and percentages of the experts' responses. The CORRLATION Coefficient were also estimated and presented. The analysis concluded with the SEA criteria.

Analysis of expert opinions as received from the questionnaire

The SEA criteria, deduced from previous studies was tested. The opinion is based on the five categories of choices: (not fully agree -don't agree - neutral - agree - fully agree)on the asked standard. Six basic criteria have been asked, containing 23 sub-criteria, each of which has a basic criterion. The question is whether they agree on the question or not.

Political will criterion:

Experts' opinions varied regarding the criterion of the existence of an environmental policy and an environmental plan for the implementation of SEA in Egypt. Noticing that about 64% of

experts (agreed - fully agreed) on the criterion of the need for an environmental policy and an environmental plan in Egypt.

As for the criterion of considering the environmental issues at the strategic level, we noticed that about 80% of experts agreed on its importance in contributing to the implementation of the sustainable development strategy, because the environmental impact always has its effects in long term.

Regarding the existence of a national environmental charter in Egypt, the opinions of experts differed; as some views were about considering the environmental charter as an agreement agreed upon by the society and the decision maker to implement it. The percentage of (73.3%) from experts agreed on the importance of a national environmental charter, while some experts mentioned that there is no need for an environmental charter in the SEA process. This does not mean that its presence is not useful for academics and consultants as the percentage of disapproval for academics and consultants was about 40%.

As for the opinions of experts on the existence of the criterion of political will and related sub-criteria about Egypt, the views of executives and decision makers agree on the lack of environmental policy and lack of a clear environmental plan in Egypt by 100% as there isn't an agreed unified environmental policy between the competent authorities, but there are studies and several visions that are usually conflicting. While academics and consultants agreed that there is no environmental policy and a clear environmental plan in Egypt with 50%. It is proposed to apply the Egyptian environmental policy to be supervised and to establish appropriate budgets as shown in Table3.

Table 3: Experts' opinion on reasons for agreeing on political will criterion

Experts'	apply environmental policy	the lack of environmental policy and lack of a clear environmental plan	Total
Academic and consultants	50%	50%	100%
Executive	0%	100%	100%
Decision makers	0%	100%	100%

Legal obligations criterion:

Expert opinions varied on the importance of the existence of an integrated environmental law in Egypt. Noticing that about 80% of experts (agreed – fully agreed) on the necessity of an integrated environmental law. Regarding the mandating of EIA standard by legislations in Egypt, it was noticed that most experts agreed on this standard with approval of about 87% of experts (agreed - fully agreed) because it is an important criterion to achieve the seriousness of applying SEA in Egypt.

As for the experts' views on the applicability of the standard of legal obligations and related sub-criteria about Egypt, decision makers agreed unanimously by percentage of 100% on the importance of a legislative basis that regulates the process of applying SEA. While academics, consultants and executives emphasize the importance of having a legislative basis to ensure the effective application and real implementation of integrated environmental law.

Capacity of environmental institutions criterion :

Regarding the criteria of the presence of specified institutional structure for environmental administrators which is represented in the importance of the existence of the Ministry of Environment, and Environmental Affairs Agency, and presence of representatives from Ministry of Environment at the regional and local levels. Most experts agreed on the importance of that criterion by (80%), (70%), (76%), respectively.

As for the criterion considering the importance of the availability of expertise in managing environmental issues, all opinions of experts (agreed - fully agreed) with 100% as its importance in achieving environmental and standards norms in a better way.

By noticing the reasons for the weakness of criterion of the capacity of environmental institutions and their sub-criteria in Egypt, the views of academics and consultants were unanimous on the importance of transparency in the relationship between different institutions, experts and society. While the decision makers see that achieving this criterion is by heading to the decentralization in dealing with environmental issues, and multiplying the number of institutions that are responsible about the environment to ensure the achievement of the environmental criteria and standards in a better way. While the views of executives considered that there is a defect in the administrative system and the lack of coordination between the various parties as a natural result of their work in different institutions as shown in Fig.1.

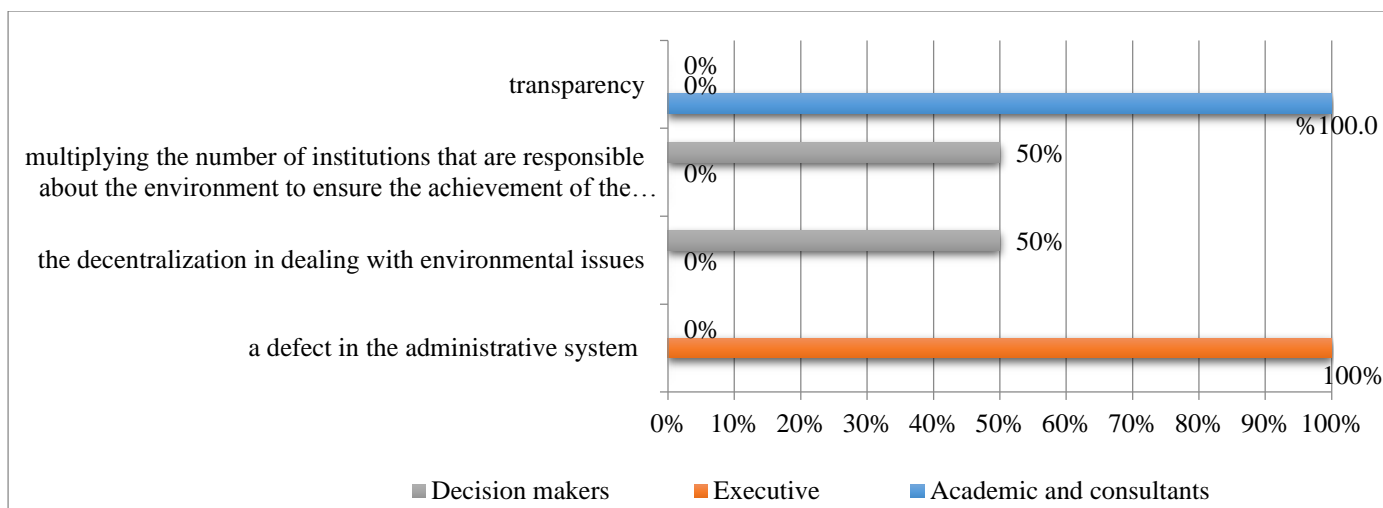


Figure 1: Experts opinion on the availability of experience responsible for the management of environmental issues

Strategic Environmental Assessment Implementation :

Expert opinions on the steps of Screening, Scoping, Appraisal of alternative, we noticed that most experts agreed on the importance of the previous criteria with percentages (88%), (86%) and (94%) respectively, due to the importance of the Screening step, which determines the excessive need for the SEA study. As for the step of the scope, determining the range of the environmental analysis and assessment.

Also Appraisal of alternative criterion should be available to Development, appraisal and assessment of reasonable alternatives.

For experts' opinions on Environmental report, Consultations, Information on the decision and Monitoring, most experts agreed on the importance of the previous criteria (83%), (76%), (85%), (91%), respectively, the importance of these criteria is to

giving the partners of the consultation the possibility to express their opinion about the environmental report and the draft plan or program during the planning and SEA process such as (Environmental authorities, The public, non-governmental organizations), and Monitoring of the significant environmental effects of the plan or program implementation in order, to identify unforeseen adverse effects, and to be able to undertake appropriate remedial action.

Experts' opinions on the existence of professional associations of experts on environmental assessments, and the holding of regular training courses to raise environmental awareness indicate that most experts agreed on the importance of the previous criteria by (69%), (73%) respectively, and we find that, the presence of professional associations of experts interested in environmental assessments, and establishing regular training courses to achieve raising environmental awareness of the community thus to achieve the concept of sustainability

Reasons for expert's agreement upon the criteria of SEA requirements are as follows:

1. Check the possibility of environmental assessment
2. Achieve sustainable development as shown in Table 4.

According to a recommendation from some experts, the coordination between the EEAA and the other ministries must be coordinated to avoid conflicting tasks.

Table 4: Reasons for expert's agreement on SEA requirements criteria

Experts'	Achieve sustainable development	the possibility of environmental assessment	Total
Academic and consultants	0%	100%	100%
Executive	.0%	100%	100%
Decision makers	100%	0%	100%

Environmental education and awareness criterion:

Most experts agreed on the importance of incorporating awareness of environmental issues into the formal education system at various levels and of education, and spreading the environmental awareness among the public by (74%) for the two criterions. The community orientation is to preserve the environment, thus achieving sustainable development and the society's awareness of its elements. Some experts suggested that awareness can be spread through interactive application programs with public rather than through media awareness only.

Reasons for the agreement of experts on the standard of environmental education and awareness because it achieves:

- 1) Avoiding the loss of effort which can be achieved by the existence of sufficient community awareness about the importance of preserving the environment
- 2) Ensuring community participation in sharing their views on projects so that the criterion of environmental education and awareness is not binding, where citizens are involved as partners and observers of environmental impact. As strengthen the environmental awareness will assure the public interest with environment, thus continuing the sustainable development process, Table 5 illustrates the views of experts on the reasons for their agreement on the criterion of environmental education and awareness and its related sub-criteria.

Table 5: Experts' views on the reasons for their agreement on the criterion of Environmental education and awareness and its related sub-standards

Experts'	strengthen the environmental awareness	community awareness and Participation	Total
Academic and consultants	100%	0%	%100
Executive	66.7%	33.3%	%100
Decision makers	100%	0%	%100

Social recognition and the role of civil society criterion:

We note that most experts agreed on the importance of mandatory public participation, consultation with

environmental NGOs when formulating policies, plans and programs by (64%) and (82%), respectively. We note the drop in the rate of agreement on mandatory public participation, as some experts see that the role of civil society is important, but it is not obligatory for the general public because it creates a situation of distress. Participation must be voluntary and aware of the importance of their role in preserving the environment. As activating the criterion of environmental awareness among the public leads to public participation without being mandatory.

To achieve the criterion of social recognition, the role of civil society in Egypt must be:

- 1) Cooperation between civil society and government in the implementation of plans and programs(Public private partnership)
- 2) Achieving effective participation, where all institutions and civil society organizations must be united to preserve the environment
- 3) Increasing the environmental awareness within public, and the views of some experts was that the goal of the development process is human comfort, so there must be a consideration made for the civil society role in the planning process as it is important to understand the civil society needs, Fig.2 illustrates the reasons for their agreement to the criterion of Social recognition and the role of civil society by analysing the opinions of experts regarding the importance of these criteria for the application on Egypt to achieve sustainable development, we find that they agree on the proposed criteria, focusing on the mechanism of their application through their proposals, and thus the final criterion is the criteria proposed by the researcher.

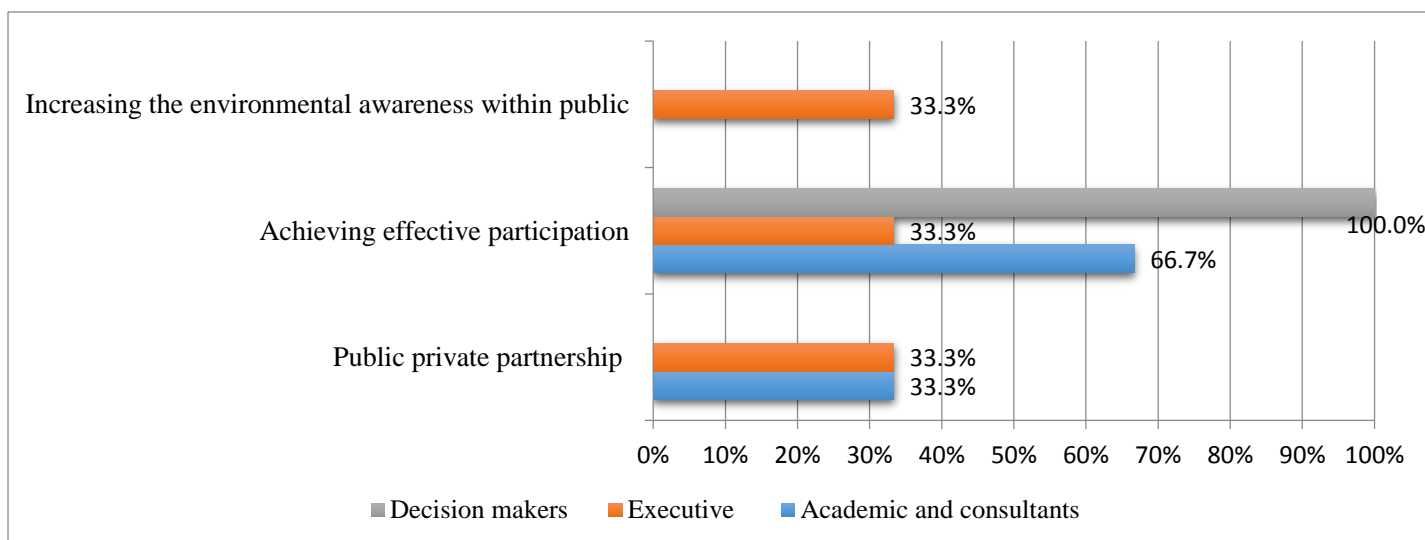


Figure 2: Experts' views on the reasons for their agreement on the criterion of social recognition and the role of civil society

RESULTS

With reference to the objectives of this research, the following results were obtained:

A proposal was made to define SEA as "a comprehensive process of environmental impact assessment of policies, plans and programs and help guide development towards sustainability by integrating environmental issues and sustainability into decision-making and environmental awareness assessment at the earliest appropriate decision-making stage, with ensuring on the existence of high level of transparency ". Its relevance is that it helps to integrate the principles of sustainability into the policy-making process in guiding the decision-making process and contributing to the establishment of an environmentally sustainable integrated framework for the formulation of policies, plans and programs.

Based on the proposed definition and research studies, the dimensions and factors of the SEA have been identified, developed and formulated for the criteria of SEA as described in Table (1). Applying those standards in Egypt requires:

- Control of environmental policy and putting appropriate budgets
- The importance of a legislative base with the establishment of a mechanism to ensure the effective and real application of integrated environmental law
- The importance of transparency in the relationship between different institutions and coordination among them with experts and society
- Decentralization in dealing with environmental issues.
- Identifying the unforeseen adverse effects of projects, taking appropriate remedial procedures, activating the inspection step and monitoring projects, to make the officials responsible for them not to exceed the permitted emission rates, thereby protecting the environment.
- Involve citizens as partners and observers of environmental impact by strengthening the environmental culture in the public, to ensure citizens' interest in the environment and thus the sustainability of development
- Achieving effective participation between civil society and government in the formulation of policies, plans and programs to achieve the preservation of the environment

SEA is a pre-planning stage in the project process, while environmental impact assessment is a subsequent process, and therefore previous processes produce far better results than subsequent processes to avoid expected environmental impacts.

RECOMMENDATIONS

The research recommends:

- The inclusion of SEA in the legislative frameworks of environmental law No. 4 of 1994 and No. 9 of 2009 and its criteria in the executive regulations of the law to be one of the basic requirements for approval of the establishment of various kinds projects, because the law includes the environmental impact assessment and this is applied at the project level at the local level.
- The establishment of mechanisms for activating the SEA and its criteria within the functions of the EEAA to include the evaluation of various planning levels from the national and regional levels reaching the local level. The role of EEAA in the current situation is limited to carrying out environmental impact assessment studies for projects, which have been proven by experiments to be environmentally useful and limited.

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