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The Need for Formal Standard Review Plan for EIA Review of the Conventional Power Plants in Egypt

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Abstract— Environmental Impact assessment (EIA) is one of the legal requirements of power plants projects in Egypt and in practices it is vary from project to project and the process serves finally to obtain the construction license of the projects. In practice, EIA has facing some challenges in the review of the reports which reflects to the quality of EIA in practice. Egypt had an ambitious development plan and this was reflected to the government plan to build a huge power plant program to fulfill its energy needs. So, different power plants are constructed and under construction in the coming few years. These power plants will need EIA to fulfill their license construction legislation. In practice and analysis of EIAs of the conventional power plants, it is noticed that some of the EIAs reports are not consistent in their format, the data presented to fulfill the EEAA requirements, and this case put a lot of pressure in the reviewers in the Ministry of Environment. Also, some EIAs had no sufficient or detailed information data about some important issues which reflected in practice to big problems during construction or after construction of some conventional power plant projects. These previous reasons showed the need for introducing standard review plan for EIA review for conventional power plants in Egypt. Standard review plans experiences are proven approach for high quality of EIA all over the world. The aim of the standard review plan is to establish a systematic formal review plan for the evaluation of the quality of EIA reports, including format, process, stakeholder engagement, public participation, and finally the quality of the technical aspects of the reports. This paper attempts to identify the challenges facing the review process of EIA review of power plants in Egypt and suggest the approach to improve it by introducing a standard review plan approach formally in the review of EIA process.

Index Terms—EIA, Standard, Review, Plan, Egypt.

I. INTRODUCTION

The quality of EIA reports varies widely from project to project. According to UN/ECA et al. (2007), some EIA reports are of very low quality and may also be excessively long and hard to understand regardless of the reader's level of education or expertise. EIA process can be attributed to the low quality and inconsistency reports, [1].

Eca et al. (2007) stated that there are many reasons behind the poor quality of EIA reports; one of the major causes is the limited environmental information and data which too many EIA reports are based on, [2]. As noted by the World Bank (2012), “the need for vast numbers of EIAs coupled with an absence of baseline environmental data resulted in mass production of EIAs of poor quality and little value”. Also, it revealed that poor EIA reports are the products of poorly trained EIA practitioners. Too many EIAs are being conducted and reviewed by judgement of practitioners based on their experiences with limited capacity and environmental information, resulting in poor-quality reports, [3].

On the other hand, the capacity within the approving environmental agencies in many of the developing countries is very important aspect. A number of studies indicate, however, that many developing countries lack the capacity to review the EIA reports submitted to them and this in turn has resulted in a deficiency of the results. There are many challenges which are facing the review process of EIA in Egypt as well as other developing countries.

In Egypt, there are vast wave of mega power plant projects which reflected to big amount of EIA's to be developed and reviewed. Also, it is noticed from practice that there is no standard formal review plan for the different kind of projects.

For this reason, an effective formal standard review plan for review EIA is needed which should requires a certain level of skill and capacity of environmental experts and which can facilitate the review process of EIA, improve the quality and reduce the time for review.



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II. EIA REVIEW SYSTEM IN EGYPT

The Egyptian EIA system was established in the Law of Environment No. 4 of 1994 and its amendments in Law No. 9 of 2009 and is implemented through its executive regulations which issued by Prime Ministerial Decree No. 338 of 1995, [4]. The Egyptian Environmental Affairs Agency (EEAA) is the main body responsible for EIA although sectorial ministries and governorates are the Competent Administrative Authorities (CAA) which possess the executive powers in relation to development authorization, [5]. The Central EIA Department of the EEAA is responsible for supervising the screening process, managing the review of EIA reports either by undertaking reviews itself or by assigning independent bodies or consultants to do so, taking decisions on the acceptability of EIA reports, and giving an opinion on the development and proposals for mitigation measures. The EEAA also has the responsibility for issuing EIA guidelines, [6].

The EIA system in Egypt is categorized the projects into three categories based on different levels of EIA according to severity of possible environmental impacts, the three categories are white, grey and black (EEAA, 2009), [7]. The mega, power plants and urban projects are categorized as black projects which due to their potentiality cause sever environmental impacts need a full EIA.

According to EEAA (2009), the EIA should be prepared and developed by a team of environmental consultants whom should have sufficient experiences to cover all environmental aspects and areas of the project. The process for EIA started as follows:

- The project owner to select a consultant to develop the EIA according to the EIA report requirements for the project - and submits it to the Competent Administrative Authority (CAA).
- CAA reviews the EIA documents and formally submits the EIA study to the EEAA for reviewing and evaluating.
- Within 30 days, the EEAA delegates the review process to their internal employees within the Central EIA Department who review the EIA study and formally submit their recommendations. The EEAA usually decides on the environmental acceptability of the project prior to project approval by the Competent Administrative Authority that takes the final decision on whether to allow the project to proceed or to reject it.

According to the environmental law, the Competent Administrative Authority should officially notify the project proponent with the result.

In this context, one of the following courses of action could be taken place:

- The acceptance of the official notification form as submitted, or acceptance after the submission of some additional data. In this case, the project is considered approved with possible measures to be taken to ensure protection of the environment.
- The project is rejected; in this case, an appeal to the Permanent Appeals Committee could be filled as prescribed by the executive regulations within 30 days of receipt.

III. CASE STUDY: EIA OF EL- AIN EL-SOKHANA POWER PLANT

El Ain El Sokhana Power Plant project consists of two supercritical thermal steam units, each with a nominal electricity generating capacity of 650 megawatts (MWe). The overall generating capacity of the power plant will be 1300MWe. The power plant was planned to be operational by the end of the year 2012/2013.

A private consulting firm (Egypt) was commissioned by the Egyptian Electricity Holding Company (EEHC)/East Delta Electricity production Company (EDEPC) to prepare Environmental and Social Assessment of the El Ain Al-Spokane Power Project according to the requirements of the African Development Bank (AFDB) and World Bank (WB). The power plant is designated as a Category 1 project under the AFDB rules and a Category C (Black category) project under the Egyptian environmental regulations and therefore requires a full Environmental Impact Assessment.

According to the environmental study, it is stated in section 6.11.3 about Natural Disaster Risks that “The risks of flooding during power plant construction and operation were also examined. However, site drainage will be

constructed to minimize any risks of contaminated water reaching the surroundings and to properly drain the site, no significant flood risk impacts are anticipated”.

In May 2014, a heavy rain occurred in the area which reflected to a flood and the power plant was flooded by the water as reported in different news. According to Akhbar Alyoum Newspaper, on 16, May 2014 [9], the floods had damaged New Al Ain El Sokhana Electrical Power plant which is under construction and a lot of damage happened because of bad site selection and lack of engineering solution to protect the plant from flood hazard, [9] as shown in figures (1) to (4).



Fig (1): Flood in El Ain El Sokhana Power Plant, 16, May 2014, [9].



Fig (2): Flood in El Ain El Sokhana Power Plant, 16, May 2014, [9].



Fig (3): Damage of cars and Equipment during Flood inside the El Ain Al Sokhana Power Plant, 16, May 2014, [9].



Fig (4): Flood in El Ain El Sokhana Power Plant, 16, May 2014, [9].

After investigation, it was recognized that the EIA report had a lack of detailed information about flood hazard and did not mention any engineering solution to protect the power plant from flood hazard. Also the reviewers did not recognize this issue. Even the study was done according to the African Development Bank Policy and Guidelines (Integrated Environmental and Social Impact Assessment Guidelines, October 2003) in preparing the ESIA. After that, some engineering solutions had been introduced to protect the power plant from flood hazard as shown in figure (5).



Fig (5): New Flood Culver introduced as an Engineering Solution to reduce Flood Risk in El Ain El Sokhana Power Plant, Photo by the Author.

This case study showed that different challenges are facing EIA of power plants in Egypt in both sides of the owners and the reviewers.

IV. CHALLENGES FACING REVIEW PROCESS OF EIA IN EGYPT

According to Ibrahim et al. (2010), there are no systematic review criteria to be used by EEAA staff. The review process is based mainly on reviewers' experiences, as well as on personal judgment. The use and application of EIA is relatively strong, and evidence of well-established EIA procedures were found, but translation of paper to action was found not fully successful. However, the environmental context review has confirmed many common challenges that give rise to inadequate EIA practice, [10].

Ibrahim Rizk, 2017 identified different challenges which facing EIA in Egypt, [11] and the current paper had investigated others challenges and these can be summarized as follows:

- Lack of transparency for access the EIA reports because it is not mandatory in the legislation system.
- Lack of information about environmental baseline date.
- No review criteria or standard review plan is existing and the reviews are based on the reviewers' experiences and personal judgement rather than on scientific analysis and prediction which is reacting to the review decision and quality of the EIA reports.
- Lack of full implementation of monitoring because of the owner financial capabilities and lack of specialized



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and experienced staff in EEAA.

- Long time of review of EIA in some projects because the law did not differentiate between the different types and categories of projects.
- No formal time limit for obtaining any additional information requested by the reviewers.
- In-appropriate land use allocation system because the approval of land starts firstly then the EIA conducted later, so it is difficult to reject projects on environmental base and the alternative sites are not mentioned and are not applicable in different projects.

V. BACKGROUND OF STANDARD REVIEW PLANS

Standard review plan for nuclear power plants was developed by U.S. Nuclear Regulatory Commission (USNRC) in the 1970's and it contains the environmental standard review plans (ESRPs) that constitute a series of instructions developed for Nuclear Regulatory Commission (NRC) staff to use when conducting environmental reviews of applications related to nuclear power plants, [12].

The Standard review plan in the USNRC contains the following chapters:

- 1) Introduction
- 2) Environmental Description
- 3) Plant Description
- 4) Plant Construction Impacts
- 5) Plant Operation Impacts
- 6) Environmental Monitoring
- 7) Impacts of Postulated Accidents
- 8) Need for Power
- 9) Alternatives
- 10) Environmental Consequences

These sections of the standard review plan can be gathered in three groups. Chapters 1 through 3 are descriptive in nature. They guide the staff's review of the regional setting for the proposed action, the detailed description of the site and its environment, and the plant and the detailed description of those features of the plant that are most likely to affect the environment. Chapters 4 through 7 are related to the technical analyses. They guide the staff's review of potential environmental impacts associated with construction and operation of the plant. Finally, Chapters 8 through 10 are related to the overall evaluation of the proposed action. They guide the staff's review of the need for power, compare the proposed action with alternatives, and summarize the conclusions related to the proposed action, [12].

Also, it contains the format for review which includes:

- Areas of Review: which describes the purpose and scope of the review for which the ESRP provides guidance. It includes a list of review interfaces which define the expected flow of information in the review process.
- Acceptance Criteria: which provides guidance on determining the acceptability of the applicant's submission with respect to the topic under review? The reviewer should ensure that the information provided by the applicant is adequate to prepare input to the EIA. Acceptance criteria for a description of the proposed project are based on the requirements described in the law and also the guidelines.
- Review Procedures which describes the methods and the level of detail that the staff should use in conducting the review.
- Evaluation Findings which provides guidance on how to summarize the conclusions of the review.
- References which contain the bibliographic information related to material cited in the plan.
- Format of Findings which should contain a brief introductory description of the proposed project and the site location and identification of the applicant and major features of the project, and summarizing the staff's procedures in conducting the environmental review which covers all the aspects of the EIA.

Also, USNRC developed a guide for the preparation of environmental reports for Nuclear Power Stations (1976), [13]. It stated that the applicant should strive for clear, concise presentations of the information provided in the environmental report. Each subject should be treated in sufficient depth and should be documented to permit a



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reviewer to evaluate the extent of the environmental impact independently. The length of the environmental report will depend on the nature of the station and its environment. Tables, line drawings, and photographs should be used wherever they contribute to the clarity and brevity of the report. The number of significant figures stated in numerical data should reflect the accuracy of the data.

Documentation as used in this guide means presentation of information, supporting data, and statements and it includes (1) references to published information, (2) citations from the applicant's experience, and (3) reference to unpublished information developed by the applicant or the applicant's consultants. Statements not supported by documentation are acceptable provided the applicant identifies them either as information for which documentation is not available or as expressions of belief or judgment, [13].

VI. MAIN ASPECTS OF EIA STANDARD REVIEW PLAN

The standard review plan should provide the quality and sufficiency of the EIA and direct attention to the key environmental characteristics and main effects of the project; it should also summarize the viewpoints submitted during deliberations, [14]. The main objectives of the standard review plan can be summarized as follows:

- To evaluate the adequacy and quality of EIA report;
- To check if the public acceptance and comments are integrated;
- To assess of the information presented in the report and determine if the information is sufficient for issuing the license;
- To identify the deficiencies that must be addressed before the report can be submitted;
- To improve the general standard of EIA reports by making applicant aware of the government expectations and review process.

The standard review plan can be a formal procedure to check the quality of work, to verify that is satisfactory and meets requirements and/or is consistent with accepted standards of good EIA practice, [15]. Normally, EIA review could carried out by the responsible authority, another government organization or committee, or an independent external body. However, the proponent or the applicant can undertake an internal review of EIA quality as part of its quality assurance. In this way, proponents can ensure that their EIA work is of an appropriate quality standard before it is subject to review by the authority. This can help to avoid delays associated with the issuance of deficiency statements, conditioned license or requests for additional information, [15].

The standard review plan for EIA can provide different benefits to both the governmental organizations and the owners of the projects and these can be summarized as follows:

- The review procedures will be more formal;
- The EIA reports will be with high levels of quality;
- The review process will be transparent process;
- The review process will be based on formal criteria and guidelines.

a) Management Procedure and Implementation of Standard Review Plan

There are a number of aspects which should considered and can help to achieve good management and practice for implementing of standard review plan of EIA reports. These can be summarized as follows:

1. Defined the scale and depth of the review.
2. Define the reviewers' capabilities and competency and the resources (manpower- facilities- etc.)
3. Define the time for conducting the review process.
4. Identify review criteria and guidelines;
5. Document the results and review conclusions.
6. Determine the decision options (need more information- approved – approved with conditions – not approved, etc.).

For the implementation of standard review plan, three steps can be carried out which include:

- **Step 1:** identifies the deficiencies in the EIA report, and this can carried out by using the Terms of Reference, relevant guidelines and criteria and information from any comparable EIA reports.
- **Step 2:** focuses on any shortcomings in the EIA report and separate crucial deficiencies, which may directly



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affect decision-making, from less important. If no serious deficiencies are found, this should be stated clearly. Remarks about less important deficiencies can be placed in an appendix.

- **Step 3:** recommends how, and when, any serious shortcomings are to be remedied to facilitate informed decision-making and appropriate measures for project implementation.

b) Findings Options of Standard Review Plan

There are different options available when an EIA report fails to meet the requirements and standards. These are scaled to the nature and scope of the inadequacies.

- **Option (1) Serious Deficiencies:** When the shortcomings of the EIA report are so serious that they require immediate action, either by a supplementary or a new EIA report. In this case, the review should give a clear statement about how the additional information can be collected and presented. In this case, the review findings realize that the decision-making will be delayed by some time until a new EIA report to be submitted or supplement to the EIA report is completed.
- **Option (2) Deficiencies Are Not Serious.** When the shortcomings are not serious and can be covered by explanatory and extra material attached to the report or conditions attached to the approval - This situation has the advantage that decision-making can proceed as planned without a major delay just by gathering additional environmental data.
- **Option (3) Not Major Deficiencies.** When the shortcomings are not major but cannot be covered immediately, either by providing additional information to the EIA, or in the form of explanations and conditions attached to the decision, because they require too much time and effort to collect - In this case, the review could recommend monitoring the shortcomings during the implementation and operation of the project.

The above options can be transferred to the following decisions:

- Accept the EIA.
- Accept the EIA with conditions.
- Need more information for clarification and then the decision can be made.
- Rejection of the EIA.

c) Methods Used in Standard Review Plan

There are different methods and tools which can be used to review the adequacy of an EIA report and they include:

- **General checklists:** This method can be used to review of EIA, using compliance with local EIA legislation or guidelines as the starting point. Sectorial checklists represent a further stage of development to review the technical adequacy of EIA reports in terms of their coverage of specific types of impacts, mitigation measures and monitoring requirements.
- **Project specific checklists and guidelines:** These can be based on a general or sectorial checklist, with further adaptations to suit the requirements of the specific project and its terms of reference.
- **EIA review frameworks and computer tools:** A number of tools are available for review of EIA. The Environmental Statement Review Package developed by the EIA Centre, University of Manchester is widely referenced and can be used by non-specialists. It comprises a seven-part rating scale, directions on its use and a collation sheet for recording findings on EIA components, such as baseline information, impact prediction and consideration of alternatives. Other review tools are available and can be adapted for use of EIA review.
- **Expert and accredited reviewers:** One or more experts can be used to peer review the adequacy of the report. The expert(s) contracted should be independent from those involved in preparing the EIA report or undertaking studies. In some countries, EIA experts are accredited or registered as capable of carrying out a study or review.
- **Public hearings:** Experience with EIA review in a number of countries has shown that public comment is a critical ingredient of good practice. The input from the public has proved to be important in checking and evaluating the quality of the EIA reports. Public hearings on an EIA report give the highest level of quality assurance. They provide affected and interested parties with an opportunity to comment extensively on the information and findings. These benefits are maximized when public hearings are held by an independent EIA panel, commission or other inquiry body. A structured and systematic process can be followed to test the



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quality of the report and to integrate technical evidence and public comment.

- **Comprehensive review of the EIA process:** Effectiveness frameworks can be used when a comprehensive review of the EIA process leading to report preparation is considered necessary. For example, this approach may be called for if there are very serious deficiencies with a report and each step needs to be revisited. Also, effectiveness review can help our understanding of how different EIA components and activities affect the quality of EIA reports and indicate ways review procedure and criteria themselves may be strengthened. In this regard, effectiveness review can cover the overall performance of the EIA process.

VII. CONCLUSION

The paper had concluded with the followings:

- Review stage of the EIA process is an important element in the quality of EIA. So, it is suggested that a formal standard review plan should be introduced to overcome the challenges facing the EIA review process in Egypt.
- The shortage of accessible and appropriate information of environmental baseline is greatly affects the effectiveness of the scoping stage, as data held in many different government departments are usually difficult to obtain. So, it is suggested to develop a new Data Bank of Environmental Information in Egypt based on the data collected through last twenty years' experience and these could be allocated in EEAA or other governmental organizations. This data bank can facilitates the environmental data to the beneficiaries.
- Formal and full public participation should be introduced to the law to be mandatory for all projects.
- The follow-up process for implementation should be made mandatory, and the license or the approval should be made in sequences such as: site permit, license for construction and license for operation.
- Introduce of the research centers and universities which have multidisciplinary experiences in EIA as a technical supporting organizations for EEAA for reviewing EIA reports.
- The responsibility of good quality EIA should depends not only on the environmental agency but also on the applicants, consultants and owners of the projects.

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