

Adaptation Measures in EIA and Risks Management: An Overview of the Legal Framework in Pakistan

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Abstract: This paper aims to discuss the development of Environmental Impact Assessment (EIA) in its historical perspective, and, its status of implementation and effectiveness in the existing legal framework in Pakistan. EIA emerged as a popular discipline in response to widespread ills, associated with environmentally unsound development pursuits in the past. The human environment witnessed serious manifestations due to persistent neglect of the natural environment in agricultural and technological revolution; especially after WW-II. The UN conference on the human environment in 1972 was the first commitment at the international level to adopt the principles of environmental conservation in development strategies. Realizing its obligations, Pakistan embarked on new institutional and legal measures for environmental preservation in 1983. In order to strengthen EIA system, the first environment ordinance, 1983 has undergone many changes to the existing Pakistan Environmental Protection Act, 1997. The changes are worth discussion in the context of growth in the number of EIA reports, and strengths and weaknesses of the current IEE / EIA Regulations, 2000. The conclusion and suggestions summarizes the prospect of EIA in the country beyond the legal cum institutional reforms to political commitment, capacity building and public involvement in the specified steps in EIA studies.

Keywords: Environmental Impact Assessment (EIA), human environment, Initial Environmental Examination (IEE), prospect, public participation

Introduction

This part summarizes the historical background of EIA, as adopted to mitigate the harmful effects, and, their subsequent unfavorable alterations in the environment due to environmentally-unfriendly development projects / programs. The tool of EIA provides an elaborate picture of the future scenario that may arise due to project implementation and offers assessment of various alternatives available, with varying levels of mitigating measures for offsetting adverse impacts on the natural vs human environment.

History of EIA

The history of Environmental Impact Assessment (EIA) is, in fact, as old as the history of development of human civilisation (Ali, 1993). Although, the safeguards of the surroundings of humankind has always been the focus of concern through the long history of development of human civilisation, the terms "environment" and "Environmental Impact Assessment" have been referred to most frequently, recently after the widespread adverse consequences of development during the last 3-4 decades. Historically, man has always altered the natural world in his pursuits of food, resources and comforts (Ali, 1993). The early impacts were emerged due to agricultural chemicals to achieve maximum yields and avert damages to agricultural produces to meet needs of the faster population growth. Before the industrial revolution, the inorganic chemicals like Sulphur before 1000 B.C and Arsenic in 79 A.D were used against pests (Ali and Siddiqi, 2000). After the industrial revolution in the 18th century, the use of various chemicals and the consequent waste, posed considerable threats to environmental quality. Other chemicals such as mercuric chloride in year 1705 and copper sulphate in year 1800 were discovered to be useful for widespread use in agricultural fields (Horsefall, 1956). In 1850 rotenone and pyrethrum (Ali and Siddiqi, 2000) and Bordeaux mixture in 1882 were discovered and brought into use (McCallan, 1967).

The discovery of DDT by Muller in 1939 was considered a welcome addition to chemical stock till 1960s, after which it was banned almost in all developed and many less developed countries due to its broad spectrum nature, persistence in the environment and bio-accumulation in living organisms. Mellanby (1970) has described the role of DDT in WWII, and suggests that it was the widespread use of DDT which helped the western powers to win the war. According to Curi (1983), EIA has become popular in 1970s, but in reality it was an activity performed under different names since the human history. Curi interestingly quotes the example of Adam (Peace be upon him) and Eve (Peace be upon her) in Paradise, when Eve made a very rapid EIA. The older approach towards EIA is

similar (Fortlage, 1990). Fortlage has given an example from 1548, when a commission comprising of chief assessors and other investigators was set up to examine the effects of the Wealden iron mills and furnaces in Kent and Sussex. The wide-scale public interest and concern for the present state of environmental safeguards as through EIA tool was aroused by Rachel Carson's book "Silent Spring" (Carson, 1962) published first in 1962 in USA and then in UK in 1963. She succeeded in showing the people how their land and lives were getting affected by the large scale and indiscriminate spraying of pesticides.

From this beginning arose public concern for the environment; and eventually pressure by the public and environmentalists forced state and federal authorities in USA to exert some control over the release of toxic chemicals into environment (Fortlage, 1990). As a result two bills were introduced to the US congress in 1969 to establish a national policy for the environment, which were later amalgamated into the National Environmental Policy Act (NEPA), which became law on 1st January, 1970. President Nixon issued Executive Order 11514 in March 1970 to implement the provisions of NEPA (Departments of the Environment & Transport, 1978). However, in view of the author, the principles of environmental assessment were accepted internationally at the United Nations conference on the Human Environment held on 5th June, 1972 at Stockholm (UN, 1972); wherein the serious concerns for environmental preservation, later on, led to the generation of the significant publication of "World Conservation Strategy" by IUCN, UNEP and WWF in 1980. Since the Stockholm conference, a number of industrialised countries have adopted EIA procedures. The Netherlands has been a driving force in the development of the state of the art of EIA in Europe. In mid seventies, the government announced its intention to submit legislation designed to create an EIA requirement. Consequently the Dutch government finally introduced its bills on EIA into parliament in May, 1981 (Moltke, 1984). According to Petts and Wood (1999), the Netherlands had in fact already put its EIA system before the European Community Directive on EIA; that was adopted in July 1985 (Wathern, 1988). The EC Directive requires for a formal review procedure of EIA reports ((European Commission, 2001). Canada, Australia, and Japan for example, adopted EIA system in 1973, 1974, and 1984 respectively. According to Turnbull (1984), there has been a slow growth of interest EIA in UK. In 1976 the Royal Commission on Environmental Pollution gave the direction that developers should provide an assessment report of air, water, waste and noise pollution arising from certain developments.

Many less developed countries have also been quick in adopting EIA procedures. Columbia became the first Latin American country for adopting EIA in 1974. In Asia and the Pacific, Thailand and Philippines have long established procedures for EIA. Thailand adopted National Environmental Quality Act in 1975, and made EIA mandatory by 1978 (Sudara, 1984). In Philippines, EIA was promulgated as part of a Presidential Decree on environmental policy; Korea adopted a mandate for EIA in December, 1979 and put into effect in January, 1980; while Brazil adopted the National Environmental Policy Law in 1981, which mandates the EIA (Lim, 1986). Pakistan adopted the first Pakistan Environmental Protection Ordinance in 1983, which requires environmental assessment for development projects (GoP, 1983), however, it was replaced with the current most comprehensive act called Pakistan Environmental Protection Act (PEPA), 1997 (GoP, 1997). The Article 50 of the Constitution of the Islamic Republic of Iran has provisions for environmental protection and clause 82 of the Law of Second Five-year Development Plan (1994-1998) and the Clause 105 of the Law of the Third Five-year Development Plan (1999-2003) puts EIA obligatory for major development projects (*eiairan website*). A number of nations in Africa, including Rwanda, Botswana and the Sudan have the experience of EIA (Klennert, 1984). The United Nations Environment Programme (UNEP) has provided guidance on the assessment of development proposals and so to level the way for adopting EIA (UNEP, 1980) and supported research on EIA strengthening in developing countries (Ahmad and Sammy, 1985). In view of the recognition of EIA, laws have been enacted in many countries, including the less developed, to facilitate public involvement and expert consultation in the EIA process (Jennifer, 2008).

EIA and Risk Management

The role of EIA as an adaptive strategy for the management of risks (Noble, 2000), associated with a proposed project on the natural and human environment can be explained by the definitions and the procedures adopted for the conduct of EIA studies. EIA being relatively new discipline, there is a range of variation regarding the EIA definition and approach towards procedures / process from country to country and amongst the academicians and scholars. Therefore, it is important to note that there is no general and universally accepted definition of EIA (Clark, 1984). However the authors have established EIA as an effective planning and management tool (Hollick, 1981; Samarakoon and Rowan, 2008; Snell and Cowell, 2006, Wathern, 1994; Wood, 1993, and Polonen et al, 2010).The procedure involves a systematic approach towards examining all the relevant parameters of the environment. Most of the authors have evaluated the role of EIA for providing "with project" and "without project" situation to the decision makers and explores a number of alternatives to minimise the adverse impacts. The concept of alternatives has been elaborated by Blanchard (1974), while Hopkins et al., (1973)

emphasises the description of present conditions, alternative actions (including engineering options, design options, location options and current action), description of probable adverse impacts and description of mitigating actions for offsetting the adverse impacts and the potential risks.

According to OECD (1979), EIA is comprised of five essential elements; in which the element (iv) is particularly on the assessment of different alternatives to minimise the unfavourable impacts. According to Garner and O'Riordan (1982), EIA plays its ultimate role for economic development by describing the repercussions of proposals on bio-physical process, social processes and cultural norms; thus aiding decision making process to avert the potential disasters associated with development proposals. Turnbull (1983), in discussion of "The Role of EIA in Decision Making" has described its function as to generate and make available information on the environmental implications of a particular plan or development project. Studying solely the essential elements or contents of EIA, one can easily reach the conclusion that EIA is the only option left to protect the environment while achieving economic development by giving the basis for making a sound decision. Motayed (1980) has advocated this approach for investigating a large number of alternatives and feasible sites for power plants and also a "Weighting-Scaling" technique for the evaluation of alternatives, in order to eliminate the problems and complexities; arising due to subjectivity in the assessment. Pearce and Turner (1990) have submitted considerable findings for sound decision making. The Tyldesley and Associates (2005) have highlighted the role of EIA from the UK experience, and its further usefulness / added value in a comprehensive survey in Netherlands (Scholten, 1997). The elements / contents of EIA discussed above are no less convincing but Ahmad and Sammy (1985), has suggested more explicit format of EIA, especially for the developing countries. The EIA procedure and the resulting contents suggested by them is comprised of:

i) Preliminary activities including,

_identify decision maker(s), taking decision on the fate of the project.

_select a coordinator for the EIA study

_decide on work allocation by the specialist experts

_write description of proposed action

_review existing legislation (about environment, other resources and land acquisition etc)

ii) Impact identification (scoping)

iii) Baseline study

iv) Impact evaluation (quantification)

v) Mitigation measures

vi) Assessment (comparison of alternatives)

vii) Documentation

viii) Decision making

ix) Post auditing

The step (v) above, is especially considered in EIA, which is comprised of different measures to eliminate the adverse impacts altogether or to minimise their intensity to tolerable levels. The last component of EIA devises plan for monitoring / post auditing of the environmental impacts during the construction and operation phase of the project.

Material and Methods

The materials and methods used for this paper are comprised of the following research tools:

- Literature review of books / journals and government documents
- Compendium of the Pakistan Environmental Laws, including IEE / EIA Regulations, 2000
- Pakistan Environmental Protection Agency and EPA's EIA Registers
- Interviews with officials of Federal and Provincial Environmental Protection Agency, Khyber Pakhtunkhwa (EPA-KP)

Results

Legal Framework

The first umbrella cover to environmental assessment system in Pakistan was provided under the “Pakistan Environmental Protection Ordinance, 1983” (GoP, 1983). The ordinance, although incomprehensive in scope and application, was the first commitment at the state level to ensure environmental safeguards in development pursuits. The ordinance required for environmental impact statement (EIA) under section 8 and outlined the necessary process under subsections (1-5) of section 8. The ordinance focused primarily on industrial operations and unspecified public waters.

The perceived technical lacunas were overcome with the existing legislation of “Pakistan Environmental Protection Act, 1997” (PEPA, 1997), which is highly ambitious to incorporate preventive and curative measure for the promotion of sustainable development in the country (GoP, 1997). The Act is comprised of 34 sections and consist 45 definitions of environment related concepts / activities to help avoid technical ambiguities / confusions in its implementation. Besides, properly defined powers and functions of Pakistan Environmental Protection Council, a policy formulating body under section 3-4, Pakistan Environmental Protection Agency, Islamabad along with the respective provincial Environmental Protection Agencies have been established under section 5-8 of the Act.

IEE and EIA System in Pakistan

The section 12 of the 1997 Act provides for IEE and EIA of development projects, which is detailed further under subsection (1-7). The public participation has been made mandatory during every review process of EIA under subsection (3), and is comparable with many developing countries such as Egypt, Tunisia, India and Srilanka (Nadeem and Hameed, 2008, Paliwal, 2006, Ahmad and Wood, 2002, and Zubair, 2001). Furthermore, there is requirement for maintaining Registers for IEE and EIA to be kept open to public for inspection at all reasonable hours under the subsection (7) of the Act. The Act has prescribed penalties under section 17, trial able by the Environmental Tribunals, established under section 20-21, and, the Environmental Magistrate under section 24. The non-compliance with section 12, relating to IEE and EIA is considered a major offence and is trial able by the Environmental Tribunals, with the power of imposing up to Rs. one million (approx. US \$ 12,000) and in case of continuing contravention or failure, with an additional fine up to Rs. 100,000 (approx. US \$ 12, 00) for every day during which such contravention continues.

The newly adopted IEE and EIA Regulations, 2000 (GoP, 2000) make the system more effective and strengthens EIA as decision making tool. The Regulations are detailed into 24 in number, and requires for IEE under Regulation 3 and for detailed EIA under Regulation 4. The Regulation 10 requires for Public Participation, which is further outlined into sub-regulations (1-6). There is a comprehensive Review process under Regulation 11; and, Monitoring requirement, as being considered essential to ensure compliance with the conditions of approval (Riffat, 2006 and Simoneit, 2005). The Monitoring system in Pakistan is provided under Regulation 19 to examine the implementation of the mitigating measures and any other unforeseen adverse impact on the environment. The Monitoring activity at present is weak as under the Regulations in vogue, it is the responsibility of the proponent of the project. This should be replaced with to be performed by an independent authority / consultants. The development projects have been categorised into Schedule I for IEE and Schedule II for EIA requirement. The categorization, however, is mainly based on projects' cost and capacity, which should be on the level of impacts and potential threats to the environment like China (Chen et al., 1999; Wang et al., 2003).

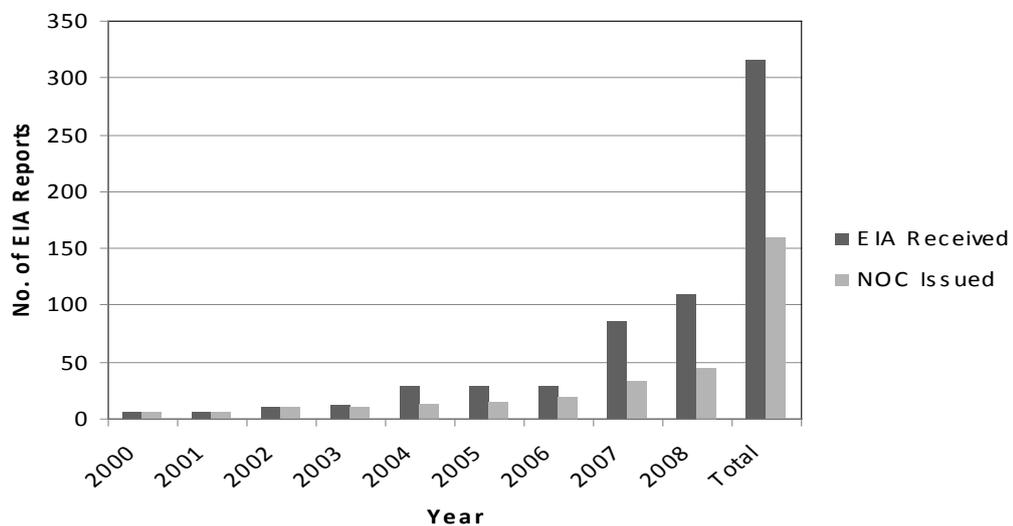
Implementation Status of EIA System in the Country

Since the first environment ordinance in the country in 1983, there has been growing recognition of the EIA tool to mitigate unfavourable impacts of development projects; and, to help pave the way for sustainable development. The data in table # 1 about the last nine years (2000-2008) illustrate a continuous increase in the number of EIA reports i.e. from 06 in the year 2000 to 109 in the year 2008, submitted to Federal and provincial EPAs for processing approval of EIA. This shows a progressive trend in implementation of the EIA system as 159 environmental clearance / NOCs were issued against 315 reports received for the purpose.

Table 1: Year-wise Implementation Status of EIA System in the Country (2000-2008)

S. #	Year	EIA Received	NOC Issued
1	2000	6	6
2	2001	6	6
3	2002	11	10
4	2003	12	11
5	2004	29	14
6	2005	28	15
7	2006	28	19
8	2007	86	33
9	2008	109	45
Total		315	159

Source: Pak-EPA, Islamabad (2009)

**Figure 1:** Year-wise Implementation Status of EIA System in the Country (2000-2008)

The province-wise status of IEE / EIA is as shown in table # 2.

Table 2: Province-wise EPAs' Performance statistics (2000-2008)

S. #	Pak-EPA	EPA-Punjab	SEPA	EPA-KP	EPA-Baluchistan	Total
1	19	202	45	34	15	315

Source: Pak-EPA, Islamabad (2009)

The statistics show that EPA-Punjab processed significant number of EIA reports during the period (2000-2008), followed by EPA, Sindh, KP and Balochistan as being based on the size of population, Annual Development portfolio and number of industrial units.

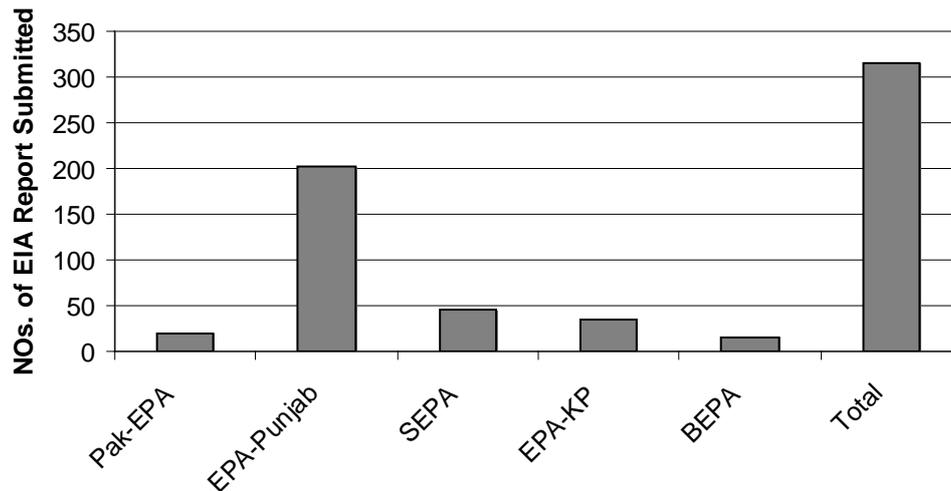


Figure 2: Province-wise EPAs' Performance Statistics (2000-2008)

Implementation Status in KP

The data about the last six years (2004-2009) illustrate a continuous increase in the number of EIA reports i.e. from 02 in the year 2004 to 07 in the year 2009; The highest number, however, of 14 EIA reports have been recorded for the year 2008, submitted to EPA, KP, for processing approval thereupon. This shows a positive trend in implementation of the EIA system as 21 environmental clearance / NOCs have been issued against 33 reports received for the purpose.

Table 3: Year-wise Implementation Status of EIA System in KP (2004-2009)

S. #	Years	EIA Received	NOC Issued	NOC not Issued	Under Process
1	2004	1	1	NA	NA
2	2005	3	3	NA	NA
3	2006	2	2	NA	NA
4	2007	6	4	1	1
5	2008	14	8	1	5
6	2009	7	3	1	3

Source: EPA-KP (2009)

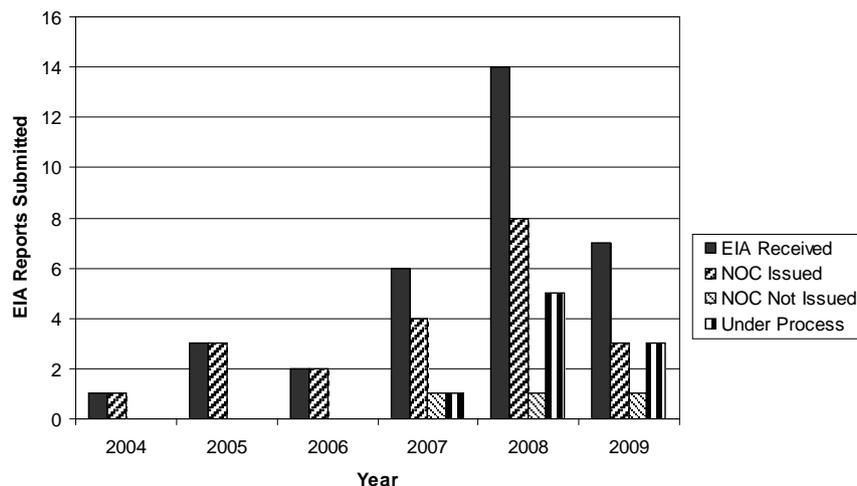


Figure 3: Year-wise Implementation Status of EIA System in KP (2004-2009)

The data show, almost, a consistent growth in the number of EIA reports, submitted to EPA, KP. The highest number is recorded for the year 2008; however, the decline in the year 2009 may be attributed to security situation arising out of large scale military operation in the province in war against terrorism.

Policy Challenges

Lack of Integration of EIA at the Planning Level

The existing EIA system needs a policy shift from using EIA tool at the project level to its use at the planning level / inception of the project, a term Strategic Environmental Assessment (SEA) often used. Under the existing system, it becomes mere compliance with the legal imperative rather to use EIA for offsetting adverse implications of the projects in terms of exploring alternatives and the least possible disapproval of the projects. The disapproval, especially of the public sector projects becomes rather difficult after the commitment of funds etc.

Lack of Co-ordination between the Line Departments

The existing PEPA, 1997 should assign overbearing responsibility to all the line departments to carry out IEE / EIA of their respective sectoral projects on their own, and must involve the Pak-EPA / provincial EPAs in the review / approval processes. This will contribute to highest consistent growth in the number of IEE/ EIA reports for projects approval.

Institutional Strengthening

The effectiveness of EIA is largely depended on proper institutional arrangements in a country. Many developing countries face the constraints of weak institutional capacity for doing EIA, and the following appraisal and review process (Nadeem and Hameed, 2008, Kruopienė et al., 2009, Clausen, et al, 2010). This study reveals that Pak-EPA / provincial EPAs are not adequately equipped with the monitoring and inspection capabilities in terms of the state of the art equipments, manpower and financial support. The effective enforcement of PEPA, 1997 and the Regulations, 2000 is largely dependent on the institutional strengthening in the country.

Lack of Public Participation

Public participation is considered as an essential requirement for the success and usefulness of EIA process (Ahmad and Wood, 2002, Annandale, 2001, Barker and Wood, 1999, El-Fadl and El-Fadel, 2004, Leu et al., 1996, Ortolano et al., 1987, Paliwal, 2006, and Wood and Coppell, 1999). Therefore it is an integral part of EIA in many developed and less developed countries (Barker and Wood 1999, Wenger et al., 1990) and a tool for the evaluation of EIA transparency (Wathern 1994). The past IEE / EIA reports in Pakistan show that the local communities are not involved in the EIA studies, the least during the impacts scoping (identification), impact evaluation and decision making. However, under the existing Regulations, 2000 (i.e. Regulation 10), there is a crude system of public participation in the form of public hearing during the review process, which carries many

shortcomings. The public participation must be comprised of involving local communities, environmental groups / associations and academia at all crucial stages of EIA, especially during the decision making process.

Political Clout

The existing political thought in the country is largely empty of extending the required support to translate environmental conservations into practice through institutional cum legal reforms and enforcement. Such situation prevails elsewhere in many developing countries (Alshuwaikhat, 2005, and Clausen et al., 2010). The political support can be heightened through vigorous campaigns, media attention and boosting green journalism in the print and electronic media.

Conclusions and Suggestions

The study shows that EIA is relatively a new multidisciplinary decision making tool in the field of environment, adopted in response to widespread adverse implications of the environmentally flawed development pursuits. Although, the importance and significance of the application of Environmental Impact Assessment (EIA) as decision making tool was realized in 1970s, its application is being promoted vigorously globally, including Pakistan, to eliminate / minimise the ill-effects of development projects on the natural and human environment.

Pakistan has passed through adopting legal and institutional reforms since the first ordinance in 1983 to the existing PEPA, 1997 and the recently adopted "IEE/ EIA Regulations, 2000". The PEPA, 1997 is more comprehensive and, sufficiently possessive of preventive and curative measures to prevent environmental degradation; and pave the way for environment friendly sustainable development. The non-compliance with Section 12, pertaining to IEE / EIA entails punitive proceedings against the violators in the form of imprisonment and fines, and therefore, the study has found a steady growth in the number of EIA reports submitted in the country. The highest numbers of reports have been submitted to Punjab province followed by Sindh. The Regulations, 2000 have consolidated the application of EIA tool in terms of projects categorisation, review process and public hearing. Although, the review and decision making process need further improvements to make the system more effective. The Act and the EIA system in the existing format is a welcome initiative, and, remarkably comparable with good EIA processes in many countries in the world. The environmental implications of the modern development continue to pose new challenges from time to time in Pakistan as elsewhere in the world. Nevertheless, Pakistan has been sufficiently consistent to pace with the global community in taking legal and institutional initiatives. However, to make the EIA system more responsive in the country, the following suggestions are underlined below:

- The EIA tool should be applied at the project's planning level to facilitate projects' financial and technical vetting vis-à-vis environmental acceptability and to help identify viable alternatives. This provision must be applied to projects preparation in all line departments of the Federal and provincial governments.
- The existing guidelines should be improved to make the procedure of EIA study cost effective and with the involvement of real experts for carrying out EIA studies. Further, the experts / consultants should be obliged to do public consultation / participation during the impacts scoping and evaluation. A code of conduct must be adopted for the EIA experts / consultants to use the EIA system for usefulness of both the project and environment.
- Amendments should be made to existing Review Procedure of the EIA reports, and the system must incorporate the local communities, media and academia during the review process.
- As EIA study is based on predictions, the actual impacts must be evaluated through a sound Post Auditing / Monitoring System in the Federal and provincial EPAs. This will help identify the gaps between the predictions and actual impacts of the projects and to act as an important feedback for future EIA studies; most importantly, for the timely intervention in wake of any unforeseen adverse impacts.
- The information sharing should be reinforced for accommodating concerns of all stakeholders and to ensure transparent / unbiased review of EIA reports, submitted to environmental agencies. Information sharing act as feedback for EIA experts / environmental agencies, and winning trust of the local communities about the utility of EIA system.

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