

A critical evaluation of the environmental impact assessment system in Bangladesh using a holistic approach

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Declaration

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. I give consent to this copy of my thesis, when deposited in the University Library, being made available for loan and photocopying subject to the provisions of the Copyright Act 1968.

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‘Knowledge is a subset of that which is both true and believed’ (Plato, 424 BC- 348 BC)

Dedication

To my beloved grandparents who were illiterate but dedicated their lives to educating my brothers and me.

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First of all, my deepest gratitude goes to my principal supervisor, Dr. Salim Momtaz for his continual support, relentless efforts, and intensive guidance in finishing this tedious task. Without his continuous mentoring and caring, it would not be possible to complete this research. Also, I thank my co-supervisor, Associate Professor Ms Natalie Moltschaniwskyj for her keen interest and support in finishing this research.

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Abbreviation and acronyms

ADB-Asian Development Bank

BCAS-Bangladesh Centre for Advanced Studies

BCL-Bangladesh Construction Limited

BELA- Bangladesh Environmental Lawyers' Association

BRAC-Bangladesh Rural Advancement Committee

BUET-Bangladesh University of Engineering and Technology

BWDB-Bangladesh Water Development Board

CBD-Conventions on Biological Diversity

CEGIS-Centre for Environment and Geographic Information System

CI-Cumulative Impact

CCG- Combined Cycle Gas

CCGT-Combined Cycle Gas Turbine

CITES-Convention on International Trade in Endangered Species

CBD-Convention on Biological Diversity

CFSD-Centre for Sustainable Development

DOF-Department of Forest

DOF-Department of Fishery

DOE-Department of Environment

DC-Deputy Commissioner

ECR-Environmental Conservation Rules

ECA-Environmental Conservation Act

ECA-Environmentally Critical Area

ECC-Environmental Clearance Certificate

EIA-Environmental Impact Assessment

EIS-Environmental Impact Statement

EMP-Environmental Management Plan

EMAP-Environmental Management Action Plan

EOI-Expression of Interest

EPA-Environmentally Protected Area

EPWAPDA-East Pakistan Water and Power Development Authority

ESIA-Environmental and Social Impact Assessment

ETP-Effluent Treatment Plant

ESMP-Environmental and Social Management Plan

EU-Environmental Unit

FB- Fixed Budget

FCCC-Framework Convention on Climate Change

FGD-Focus Group Discussion

GOB-Government of Bangladesh

ICBD-International Convention of Biological Diversity

IUB-Independent University of Bangladesh

IESC-Important Environmental and Social Component

IEC-Important Environmental Component

IEE-Initial Environmental Examination

IWM-Institute of Water Modelling

ISCs-Important Social Components

IUCN-International Union of Conservation on Nature

JMBA-Jamuna Multipurpose Bridge Authority

JMBP- Jamuna Multipurpose Bridge Project

KJDRP-Khulna Jessore Drainage Rehabilitation Project

KWH-Kilo Watt Hour

MPL-Meghnaghat Power Limited

MPSA-Meghnaghat Power Site Area

MPP-Meghnaghat Power Plant

MOEF-Ministry of Environment and Forest

MW-Mega Watt

NBAPB-National Biodiversity Action Plan for Bangladesh

NEP-National Environmental Policy

NCS-National Conservation Strategy

NEC-National Environmental Council

NGOs-Non Governmental Organisations

NO_x-Nitrogen Oxides

NTS-Non Technical Summary

PAPs-Project Affected Persons

PC-Planning Commission

PRA-Participatory Rural Appraisal

QCBS-Quality and Cost Based Selection

RCC-Resource Control Centre

RAP-Resettlement Action Plan

RRAP-Revised Resettlement Action Plan

SCF-Standard Cubic Feet

SO_x-Sulphur Di Oxides

SUB-State University of Bangladesh

SWMC-Surface Water Modelling Centre

TBM-Tidal Basin Management

TOR-Terms of Reference

TRM-Tidal River Management

UP-Union Parishad

UK-United Kingdom

USA-United States of America

USAID-United States Agency for International Development

VGd- Vulnerable Group Development

WARPO-Water Resource Planning Organisation

WB-World Bank

WC-Water Committee

WMC-Water Management Committee

Abstract

Environmental Impact Assessment (EIA) is an environmental management tool used widely in more than 100 countries and, by multilateral and bilateral agencies. Like many other jurisdictions, the EIA has been practiced in Bangladesh as an environmental management tool for projects with the aim of protecting the environment from impacts. While in developed countries a good number of studies are available, the evaluation of EIA systems in developing countries is a neglected area. The evaluation of an EIA system helps to understand how an EIA system is working, the strengths and weaknesses of the system and areas for further improvement.

In Bangladesh, the EIA system has been formally in place since 1995 but no comprehensive study has been conducted to understand how the system is working including its strengths and weaknesses. Therefore, a comprehensive investigation is warranted to identify any shortcomings, leading to suggestions for improvement of the EIA system in Bangladesh.

The study of an EIA system should focus not only on the practice of the EIA, but also on the necessary legal and administrative arrangements that support its practice and subsequent outcomes. With this in mind, this research used an integrated-holistic framework to understand the effectiveness of the EIA system in Bangladesh. This framework facilitated a comprehensive investigation of the EIA system covering institutional arrangements, the practice of EIA (i.e. the quality of EISs), and subsequent outcomes (i.e. the implementation of mitigation measures and monitoring).

The first area of investigation is the institutional arrangements of the EIA in Bangladesh. The study shows that, in Bangladesh, there is legislation for EIA practice and designated agencies to administer EIA implementation. These make a good foundation for EIA practice. However, there is a lack of comprehensive EIA legislation that clearly outlines the requirements of key stages of EIA process. The current legislation does not clearly define the key stages of EIA process (i.e. scoping, community involvement, mitigation and monitoring) and other procedural requirements, such as the contents and review of Environmental Impact Statements (EISs). A comprehensive provision of EIA requirements detailed in legislation is necessary in Bangladesh. Furthermore, the administrative capacity of the DOE is weak due to the shortage of trained staff, inadequate budget and lack of stable leadership. These weaknesses keep the DOE's efforts to implement EIA at a minimum.

The second area of investigation is the quality of EISs that is the product of an EIA process. This area examines to what extent the tasks of the EIA process (stages of EIA and other procedural requirements) are addressed in practice. Reviewing thirty (30) EISs, this study shows that the quality of EISs in Bangladesh is generally satisfactory. However, a significant proportion (34%) of EISs is still poor. The deficiencies in the contents of EISs include inadequate baseline data, poor impact prediction and evaluation of the significance of impacts, analysis of alternatives, and the poor presentation of information in a Non-Technical Summary (NTS). A number of factors influencing the quality of EISs have also been identified.

The implementation of mitigation measures, the third area of investigation, shows that they are poorly implemented in Bangladesh. Three projects from different sectors were investigated and the findings show that none of the projects' mitigation measures were fully implemented. Community participation and monitoring programs were inadequate during the implementation of environmental mitigation measures of projects. A number of factors behind the partial implementation of environmental mitigation measures, inadequate community participation and monitoring were identified.

Finally, after the identification of the current strengths and weaknesses of the EIA system, this study concludes that, while the EIA system in Bangladesh is heading in the right direction, more improvements are required to make the system effective. Interventions by the government of Bangladesh are needed to improve the institutional capacity, the quality of EIA reports, and the implementation of mitigation measures. Importantly, the proper implementation of mitigation measures is deemed to be essential to harness the benefits of an EIA as an environmental management tool.

Chapter-1

Introduction

1.1 The problem and the research gap

Bangladesh is a country in economic transition with an average of more than 6% economic growth rate during the last decade. An open market economy was implemented in the early 1990s and since this time there has been an increasing amount of investment every year, particularly in industrial and infrastructure sectors. Recently, investment has been growing in other sectors as well, for example, oil, gas and coal mining that are undertaken to explore and exploit mineral resources. All these development activities entail significant environmental and social impacts. An Environmental Impact Assessment (referred to hereafter as an EIA) is a tool used widely to identify and assess the impacts of projects and thereby make the projects environmentally viable and socially acceptable. An effective and up-to-date EIA regime is thus essential to efficiently manage the potential environmental and social impacts.

The EIA is a legally adopted environmental management tool in both developed and developing countries (Abaza, Bisset & Sadler 2004, Briffett 1999, Thomas 2005). For more than 15 years, the EIA has been available formally in Bangladesh in response to the growing environmental concerns and demand from donor agencies. However, there is a dearth of scientific information about the EIA system in Bangladesh, that is, whether the EIA system is in compliance with good practice requirements. In the

absence of adequate scientific information, the performance of EIA is largely unknown in Bangladesh.

Literature recognises that EIA is now an integral part of the development process. The EIA is seen to fulfil a valuable role in making a project environmentally feasible and socially acceptable (Cashmore et al. 2004, Conacher & Conacher 2000, Glasson, Therivel & Chadwick 2005, Gilpin 1995, Momtaz 2005, Sadler 1996, Thomas 2005). Therefore, in those countries with a longer history of adoption, EIA systems have been reviewed, modified and expanded in the light of past experiences to harness the benefits of EIA (Petts1999). EIA systems are relatively matured and advanced, particularly in developed countries. However, the circumstances of the EIA systems in developing countries are different.

Literature shows that, in general, EIAs are still weak in developing countries (Ahmed & Wood 2002, Briffett 1999, Lee & George 2000, Wood 2003). In developing countries, an EIA is usually considered by proponents as a tool for obtaining a clearance certificate rather than as a means for environmental protection. In most cases, the EIA system is characterised as a weak institutional arrangement, which includes any lack of influence of an environmental agency in implementing the EIA; a generally poor quality of Environmental Impact Statements (EISs); a limited role and capacity of stakeholders; and a limited and inadequate implementation of monitoring measures (Ahmed & Wood 2002, Briffett 1999, Lee & George 2000, Wood 2003). Due to these institutional and technical weaknesses, the benefits of EIA are yet to be fully exploited in developing countries.

While many countries have been reviewing the EIA system by way of identifying its strengths and weaknesses for further enhancement of its potential, a comprehensive study of the EIA system in Bangladesh is yet to be done. Little is known about how the EIA is working in Bangladesh to protect the environment from social and environmental impacts of development projects. There is little evidence as to whether the EIA system in Bangladesh is complying with requirements of an effective EIA system and thereby providing support in making development projects environmentally viable.

Since the formal introduction of an EIA system in Bangladesh, a few attempts have been made (for example: Ahammed & Harvey 2004, Momtaz 2002, Momtaz 2003, Momtaz 2005) in order to understand the status of the EIA in Bangladesh. However, each of these studies only provides a partial view of the EIA, rather than a complete picture. To understand the effectiveness of the EIA in Bangladesh at full scale, according to Momtaz (2005), a thorough understanding of the EIA process, including institutional arrangements, implementation of methodological requirements (e.g. the quality of EISs), and environmental mitigation measures are necessary. According to this view, a comprehensive study of the EIA in Bangladesh is necessary. This research is an attempt to fill this gap.

1.2 Rationale of the evaluation of EIA system in the context of Bangladesh

Although there are detailed studies on the EIA systems in some developing countries, the findings of those studies may not completely fulfil the expectations of other similar developing countries. This is because, EIA practice often depends on the context of a particular country (Briffett 1999, Lee 2000a, MacDonald 1994). Despite the fact that the basic elements of the EIA system are common, the extent of the problems associated with the EIA varies from country to country (Petts 1999). From this, any policy advice on EIA applications and the development of an effective EIA system should be country specific (Cherp 2001). Therefore, a study of EIA system in Bangladesh on its own is warranted.

In addition, the operation of EIA and EIA's quality can be improved if the status of the role of EIA is examined. This will require determining which features of the process are working well and which require strengthening. Fuller (1999) underscores this by explaining that the evaluation of the EIA process provides the opportunity for making substantial advances by way of being the catalyst to significant improvements to the EIA system (Fuller 1999, p.72). The evaluation of the EIA system provides an idea of how the EIA can be better used and the findings of an evaluation can also provide direction for the refinement of the EIA system (Thomas 2005).

Furthermore, the aim of this study is to improve the EIA system in Bangladesh. Since the formal introduction of EIA in Bangladesh in 1995, there has been a lack of adequate scientific information about the EIA system in that country. With this in mind, this study provides scientific information and a body of knowledge for policy makers in

Bangladesh. The policy makers can be assisted in finding the areas of improvement and necessary interventions by utilising the information provided by this research. In addition, the information from this study can be useful to the wider community, including EIA practitioners and academic researchers.

1.3 Research aim, objectives and research questions

The aim of this research is to improve the EIA system in Bangladesh. The objectives are to identify the strengths and weaknesses of the EIA system, the factors causing weakness and to provide policy recommendations. It is notable that the ultimate purpose of this research is to provide an ‘analytical generalization’ and insights about the performance of the EIA system in Bangladesh.

With the aims and objectives mentioned above, the key research question is:

To what extent is the EIA system effective in Bangladesh? In order to answer this key research question, the following three research questions are addressed. These are:

Question-1: To what extent are institutional arrangements adequate for the EIA system in Bangladesh?

To answer this question, the institutional arrangement for the EIA system in Bangladesh has been examined. The legal framework of the EIA system in terms of legislation for EIAs, its nature and its shortcomings were examined. The administrative framework, in terms of capacity, function and the nature of environmental agencies responsible for the enforcement of EIA legislation was examined.

Question-2: What is the quality of EISs in Bangladesh? (That is, to what extent are the requirements for the EIA process performed in practice).

To address this question, the quality of EISs (as products of the EIA process) have been reviewed and areas of weaknesses and strengths in the contents of EISs have been identified. This question particularly investigated how the EIA methodological requirements are implemented by the proponents in practice.

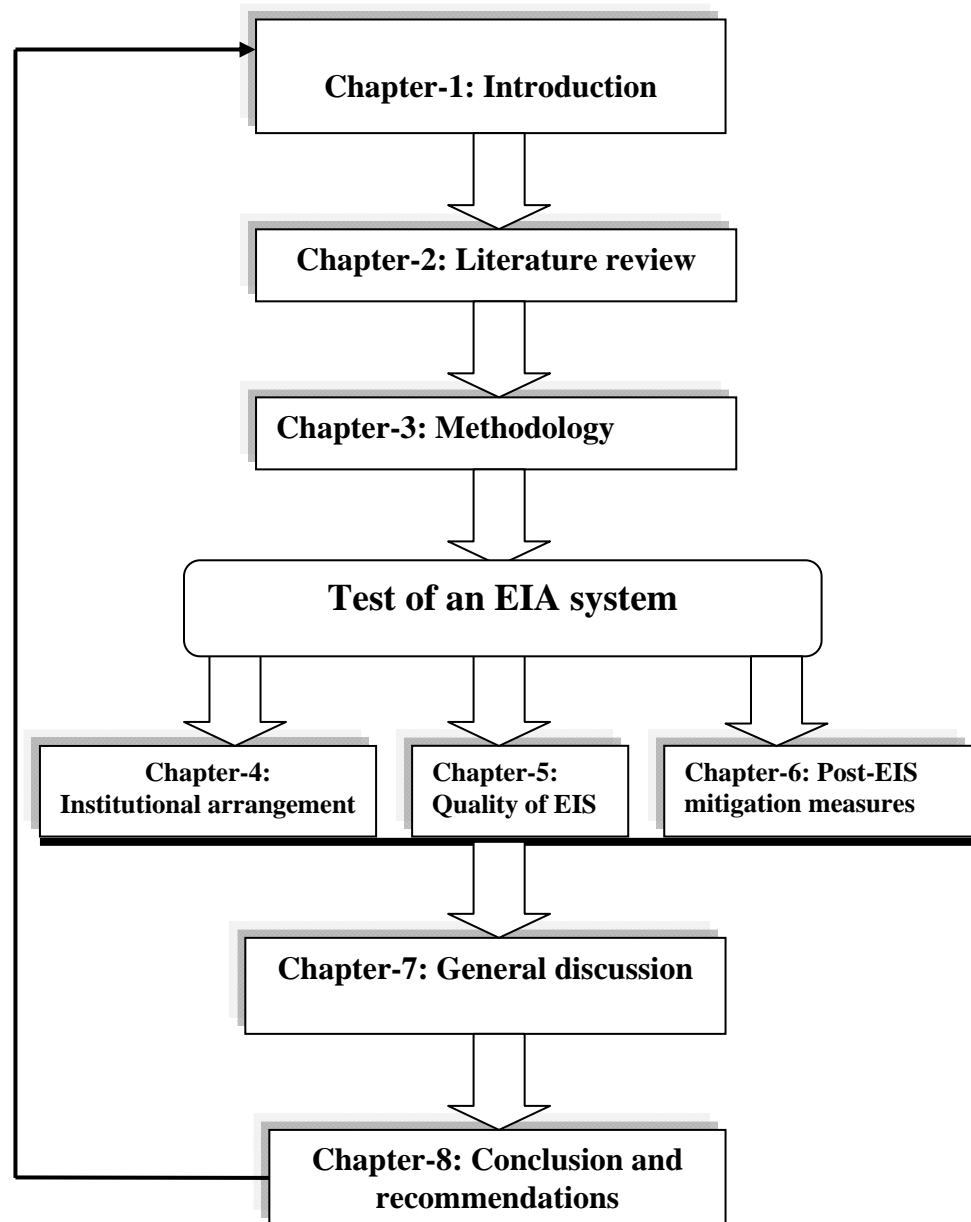
Question-3: To what extent are the proposed mitigation measures implemented at the post-EIS stage of the EIA process?

To address this question, the status of the mitigation measures implemented was examined in the case of three projects. In addition to the status of mitigation measures, community participation and monitoring activities were examined. Furthermore, attempts were made to understand the factors that may influence the implementation of mitigation measures.

1.4 Thesis structure and brief overview of chapters

This thesis is divided into eight chapters, as shown in Figure 1.1. A brief description of each chapter (except this chapter) is provided below:

Figure 1.1: Structure of thesis



Chapter-2: This chapter contains a literature review, including that of EIA in developing countries and the concept of an effective EIA system. A review of findings on the status of the EIA system in developing countries is presented. Various approaches to an effective EIA system are also reviewed in this chapter, including the identification of the strengths and weaknesses of these approaches and the development of an integrated-holistic framework necessary to review the EIA system in Bangladesh. Lastly, the chapter focuses on the key areas of the EIA system in Bangladesh that were investigated.

Chapter-3: This chapter describes the methods of data collection. A number of suitable methods were selected and used to collect necessary data for this research. The methods include a schedule of interviews schedule, a review package, site visits and direct observations, and document analysis. This chapter also covers why these methods were found to be suitable in the context of this research and the procedures that were followed to collect data. The process of data analysis and the procedures for controlling the quality of this research were also described.

Chapter-4: The purpose of this chapter is to investigate the adequacy of institutional arrangements for the EIA system in Bangladesh. This chapter describes the legal and administrative framework of the EIA system and the key stages of the EIA process in Bangladesh. The chapter then presents the findings and a discussion on the strengths and weaknesses of the institutional arrangements of the EIA system in Bangladesh. Overall, the legal and administrative arrangements for EIA practice are reviewed in detail and a number of weaknesses and strengths are identified and described.

Chapter-5: The purpose of this chapter is to investigate the quality of EISs in Bangladesh. This chapter presents findings on the quality of EISs in Bangladesh with a detailed analysis and identification of strong and weak areas in the contents of the EISs. This chapter provides findings in order to understand to what extent the procedural and methodological steps of the EIA process (such as screening, scoping, assessment of impacts, and mitigation measures) are addressed in practice by the proponents. In addition, the factors affecting the quality of EISs in the context of Bangladesh are identified, analysed and described.

Chapter-6: The objective of this chapter is to investigate the status of mitigation measures implemented in the case of three projects. This chapter presents the findings and discussion on the implementation of mitigation measures in order to understand the performance of the EIA system at the post-EIS stage. Three projects, implemented at three different locations in Bangladesh, are analysed with a view to understanding to what extent mitigation measures recommended by the EIA reports are implemented by the proponents. This chapter also presents findings on the implementation of the monitoring programs and community participation in the case of three projects.

Chapter-7: This chapter provides a general discussion about the status of the EIA system in Bangladesh. The findings presented in Chapters 4, 5 and 6 are synthesised, in order to provide an overall understanding and insight into the current position of the EIA system in Bangladesh. This chapter provides an explanation of why some aspects of institutional arrangements are weak, when the quality of EISs is poor, and why

mitigation measures are inadequately implemented. Attempts are also made in this chapter to substantiate the findings of this study by the findings of other similar studies.

Chapter-8: This chapter draws conclusions on the EIA system in Bangladesh. The background and objectives of research are restated, and a summary of key findings of the research is then given against each of the research questions. Recommendations are made for improving the EIA system in Bangladesh based on the findings of this research. Lastly, this chapter briefly outlines the contribution of this research and identifies a number of topics for future research.

1.5 Chapter summary

This chapter, Chapter 1, provides a brief outline of the study of the EIA in Bangladesh. The background of this research and need for a study on the EIA system in Bangladesh are explained. In addition, the aim and objectives of this research are also described in brief. The chapter concludes by briefly outlining the contents of each chapter in this thesis.

Chapter-2

Literature review

2.1 Introduction

In this chapter, Section 2.2 provides information on the status of EIA systems in developing countries. Section 2.3 offers an overview of the conceptualisation of an effective EIA system based on different authors' views. In Section 2.4, different approaches to effective EIA systems are reviewed and thereby a conceptual framework of an effective EIA system has been developed. Section 2.5 describes the application of the holistic approach/conceptual framework order to evaluate the EIA system in Bangladesh with a brief description of three key areas of the EIA system. Section 2.6 provides a brief description of the evolution of the EIA system in Bangladesh. Section 2.7 identifies the research gap after a brief discussion of the EIA in Bangladesh. Section 2.8 states the research questions including aim and objectives. This is followed by a chapter summary.

2.2 Status of EIA systems in developing countries

The evolution of EIA systems in developing countries differ from that of developed countries (Briffett 1999, Thomas 2005, Wood 2003). The first EIAs to be carried out in developing countries were predominantly in response to pressure from development assistance agencies on a project-by-project basis. On the other hand, the EIA was introduced in developed countries mostly in response to the widespread local demand for better environmental protection (Doberstein 2003, Horberry 1985, Wood 2003). In the later years, the emergence of sustainable development agenda influenced developing

countries towards adopting EIA. In general, EIA was introduced later in developing countries than in developed countries, with a few exceptions, such as the Philippines (in 1977) and Columbia (in 1974): these countries established EIA procedures earlier, predating those in many developed countries.

In addition, the extent of research on the EIA system in developing countries is less than that in developed countries. This is despite a good number of research that has been conducted on EIA systems in developing countries (Ahmad & Wood 2002, Appiah-Opoku 2001, Briffett 1999, Doberstein 2003, Ebisemiju 1993, Glasson & Salvador 2000, Kakonge & Imevbore 1993, Lee & George 2000, Lim 1985, Lohani et al. 1997, Nadeem & Hameed 2008, Paliwal 2006, Pisanty-Levy 1993, Ramjeawon & Beedassy 2004, Ross 1994, Sadler 1996, Sankoh 1996, Tongcumpou & Harvey 1994, Turnbull 2003, Vidyaratna 2006, Wang, Morgan & Cashmore 2003, Wood 2003, Zeremariam & Quinn 2007, Zubair 2001). These studies show, in general, that the operation and performance of EIA practice in developing countries usually falls behind that of developed countries. In other words, the EIA system in developing countries is deficient in effective EIA system requirements. Table 2.1 presents a summary of views on the status of EIA practice in developing countries.

Table 2.1: Status of EIA systems and practices in developing countries

Authors	Country	Major deficiencies in EIA systems
Lim (1985)	Philippine, Korea and Brazil	Actual performance of EIA is significantly diverse from the objectives of EIA; EIA is not fully integrated in planning process; limited authority of review agency.
Kakonge and Imevbore (1993)	African countries	Lack of formal legislation for EIA; institutional framework; shortage of manpower and inadequate training; high cost of EIA, inadequate baseline data; and public participation.
Ross (1994)	Philippines	Uses EIA as an approval tool; political interference in EIA review; corruption of environmental agency; proponents' negative attitude; and limited role of donor agencies.
Tongcumpou and Harvey (1994)	Thailand	Institutional weaknesses; limited judicial and public control; weak position of environmental agency.
Briffett (1999)	Southeast Asian countries	Lack of administrative and legal arrangements; bureaucratic attitude; inadequate assessment of impacts; community participation.
Glasson and Salvador (2000)	Brazil	Inadequate monitoring; bureaucratic approval process; and weak institutional arrangements.
Appiah-Opoku (2001)	Ghana	Baseline information; lack of experts; lack of environmental awareness; and institutional-review of EIA.
Ahmad and Wood (2002)	Egypt, Turkey and Tunisia	Inadequate implementation of mitigation measure; inadequate review of EIA reports and Terms of Reference (TOR); limited public participation; lack of interagency cooperation, sector specific guidelines, and training.
Turnbull (2003)	Fiji	Lack of assessing alternatives; monitoring outcomes; bureaucratic and political culture.
Wang et al. (2003)	China	Inadequate analysis of alternatives; limited public involvement; poor impact prediction, mitigation and monitoring; and inadequate institutional infrastructure.
Doberstein (2003)	Vietnam	Poor quality of EIS; poor public involvement; limited post-EIA monitoring; inadequate institutional capacity including bureaucratic weaknesses.
Wood (2003)	Developing countries	Poor analysis alternatives; poor EIA reports; limited community participation; inadequate mitigation measures and monitoring.
Zubair (2001), Vidyaratne (2006)	Sri Lanka	Inadequate knowledge of officers; financial constraints; complex project approval process; professional control of consultants; weak infrastructure for enforcing EIA regulations.
Paliwal (2006)	India	Poorly defined screening and scoping; insufficient baseline data; inconsistent application of impact assessment methods; improper monitoring and implementation; limited public participation; poor EIA reports; and lack of coordination.
Zeremariam and Quinn (2007)	Eretria	Lack of EIA guidelines, limited monitoring, and poor quality of EISs (EIA reports).

The studies in Table-2.1 show that the EIA system in developing countries is generally weak and the extent of progress of EIA practice differs from country to country. In general, the common issues that are deterring the EIA to work effectively in developing countries are: 1. inadequate institutional arrangements (legal, administrative and procedural); 2. poor quality of information in the EIA reports (deficiencies in the implementation stages of the EIA process); and 3. limited practice and poor implementation of mitigation measures. In addition, further deficiencies include broader contextual factors such as political will, bureaucratic culture, and environmental awareness among the proponents and local community.

Requirements for an effective EIA system in both developed and developing countries are relatively similar, although the level and extent of problems related to the implementation of EIA are different. A common inference in EIA literature is that, institutionally, EIA is already well established in developed countries (Abaza, Bisset & Sadler 2004, Glasson & Salvador 2000, Glasson et al. 2005, and UNEP 2002) the only challenge is to address the technical shortcomings in order to make the EIA more effective. On the other hand, the Table 2.1 shows that the practice of EIA in developing countries diverges from developed countries, not only from procedural and technical shortcomings but also from other shortcomings in relation to legislative and administrative capacity. Broadly, the EIA system of developing countries is characterised by poor socioeconomic conditions, the lack of organised public pressure, and the lack of pro-environmental political situation (Ebijemiju 1993, Lim 1985, Wang, Morgan & Cashmore 2003).

The extent and coverage of the above mentioned shortcomings of EIA systems also vary from jurisdiction to jurisdiction of EIA within developing countries. Some developing countries have successfully overcome some of these deficiencies over time while other developing countries still experience shortcomings in the EIA system. Furthermore, countries experience the shortcomings of EIA practice in different ways, depending on the administrative and developmental characteristics of each jurisdiction (Gamman & McCreary 1988, Knill 1998, Kolhoff, Runhaar & Driessen 2009). Naturally, the perception and the reality of problems associated with EIAs differ from jurisdiction to jurisdiction (Brown, Mindmarsh & McDonald 1991, MacDonald 1994). It is important to recognise that each deficiency has different characteristics. Furthermore, the degree of influence on EIA system varies in each jurisdiction according to their different socioeconomic milieu.

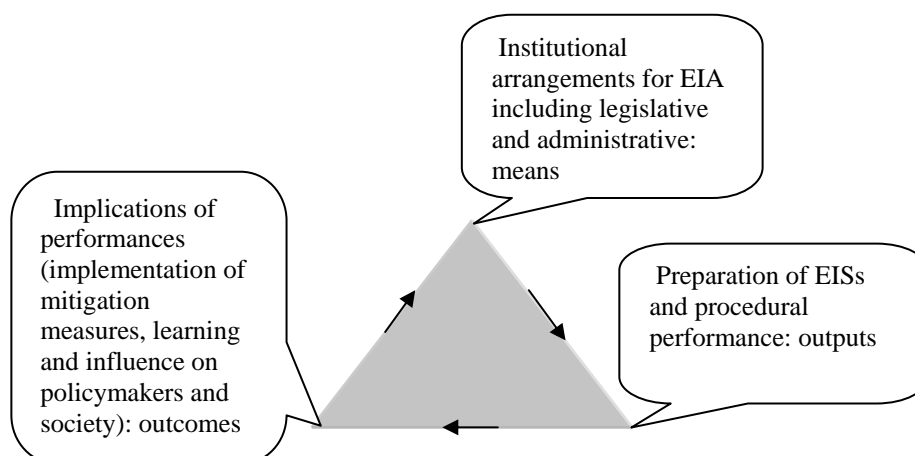
2.3 Concepts of effective EIA systems

The concept of an effective EIA system or the effectiveness of the EIA system¹ is widely studied in EIA literature (Jay et al. 2007, Ortolano, Jenkins & Abracosa 1987, Sadler 1996). However, there is no set and commonly agreed definition of an effective EIA system or as to the effectiveness of the EIA. The particular definitions adopted by authors depend on the level of investigation, and their perception about the roles and goals of the EIA (Brown & McDonald 1995) and the context in which the EIA operates (Fischer & Gazzola 2006, Marsden 1998).

¹ 'Effective EIA system' and 'effectiveness of EIA' will be used interchangeably in this thesis.

Sadler (1996) defines EIA effectiveness as to the extent that an EIA achieves its intended goals. However, the extent of goals achieved by an EIA depends on how well it works (Doyle & Sadler 1996). Again, how well an EIA system can work depends on a number of issues that ultimately constitute an effective EIA system. Broadly, these issues involve procedural issues, and outcomes issues in addition to institutional issues (Sadler 1996). Thus, to understand the effectiveness of an EIA, one needs to look at both ‘means’ that enable the EIA system to work well and ‘ends’ (outcomes) that should be achieved by the EIA. With this in mind, an effective EIA system can simply be defined as one that includes three major dimensions (Figure 2.1): 1. adequate institutional arrangements (‘means’ to make EIA system well functional); 2. the quality of EISs (outputs of EIA process); and 3. implementation of mitigation measures and improvement of natural environmental and social wellbeing (outcomes).

Figure 2.1: Dimensions of an effective EIA system



Source: Adapted from Doyle and Sadler 1996

Many of the relevant literature state the elements or criteria that can define an effective EIA system (Briffett 1999, Doyle & Sadler 1996, Fuller 1999, Kennedy 1988, Ortolano,

Jenkins & Abracosa 1987). The elements of effective EIA system as stated by individual authors, however, are not always exhaustive and are often overlapping. In general, literature shows that authors tend to conceptualise the elements that are required for an effective EIA system and for when the EIA system becomes effective. The next section describes existing approaches to understanding issues and elements of an effective EIA system.

2.4 Development of a conceptual framework to evaluate EIA system in Bangladesh

2.4.1 Approaches of an effective EIA system

A significant body of literature has developed approaches and ways to understand and evaluate an effective EIA system. Based on a survey of this literature, the researcher has identified a number of approaches that have been used to understand the effectiveness of an EIA. These approaches are:

1. Institutional control approach
2. Decision making and quality of EISs approach
3. Contextual approach
4. Social system approach

2.4.1.1 Institutional control (administrative and legislative) approach

Many studies contained in the EIA literature see the effectiveness of the EIA from institutional points of view. The studies by Abracosa and Ortolano (1987), Bartlett and Kurian (1999), Briffett (1999), Brown, Mindmarsh and McDonald (1991), Ebisemiju (1993), Hirji and Ortolano (1991), McDonald and Brown (1995), Ortolano (1993), Ortolano, Jenkins and Abracosa (1987), and Ortolano and Shepherd (1995) outline the institutional aspects of EIA effectiveness. This approach proposes that an EIA affects the way administrative institutions and legislative arrangements behave. According to

this approach, the authors argue that an EIA works well when there is a strong control mechanism including solid administrative and legislative support. The bottom line of this mechanism is to control the proponents' activity within the EIA process. Under judicial control, for example, proponents tend to prepare better EIA reports and comply more with EIA procedure as they are in fear of public litigation. Ortolano, Jenkins and Abracosa (1987) have proposed six ways of controlling the EIA process (Box 2.1) and assert that the presence of this control mechanism may assure the quality of an EIA.

Box 2.1: Control mechanisms for an effective EIA system

Procedural Control: centralised environmental administrative unit promulgates the EIA requirements, *but does not have the power to modify the project.*

Judicial Control: court has power to judge allegations of inadequate attention to the EIA, *but does not have direct control over the project proponents in relations to EIA compliance.*

Evaluation Control: centralised administrative unit issues recommendations to decision makers based on an appraisal of the proposed project and the EIA, *but proponents may not comply with the conditions of approval when they are powerful. .*

Professional Control: project planners have professional standards and codes of ethical behaviour that lead them to undertake EIAs for proposed project, *but may not have control over EIA consultants.*

Instrumental Control: multilateral or bilateral lending institution requires an EIA before it makes a final decision to release fund for a project, *but both proponents and EIA consultants are not under its direct control.*

Direct Public and Agency Control: citizens, nongovernmental or government agencies apply pressure to influence the EIA process, *but outside the context of above listed controls.*

Source: Ortolano, Jenkins & Abracosa 1987

One important aspect of the above approach is that it proposes a set of command and control arrangements including clear and mandatory legal requirements. This clear legislation and ethical code of conduct may force the proponents to comply properly with the EIA requirements (Ebisemiju 1993) and thereby, meet the expectations of other stakeholders. On the other hand, the absence of clear legal directions may lead to general avoidance and blatant abuse of the legislation, especially where fines and penalties are minimal (Briffett 1999). These mandatory legal arrangements, including the statutory principles of EIA, are necessary for managing the EIA process effectively, particularly in the context of developing countries (Briffett 1999).

This approach has some shortcomings. First, this model is restricted to the administrative procedure, ignoring the broader socio-political context where the EIA operates. The administration of an EIA may be faced with a variety of contextual forces. These forces may exert an influence on the behaviour of administrative controls in order to shape the ways and means of practice. Therefore, the application of this approach to evaluate an EIA system without considering the context of a country can result in a limited picture of the system.

Second, this approach does not focus explicitly on the power relations among the agencies, an important yard stick against which to assess the effectiveness of an EIA (Bartlett & Kurian 1999). The proponents may often have more influence than the administrative agency because of the position of the administrative agency in government hierarchy or political preference. In this case, the administrative control may face difficulties in ensuring an effective EIA procedure. This may be called 'the

bargaining position', as reflected in the ability of an agency (in absolute or relative terms) to exploit its position for the achievement of its mandated goals. The better the bargaining position, the more capable this position is in attaining its varied and transient goals and ultimate goals.

Third, this approach does not consider explicitly the importance of interagency cooperation for effective EIA. Even in the presence of adequate administrative capacity, knowledge and resources, the EIA process may not be effective in the absence of cooperation and effective networking between proponents, consultants, and administrative agencies both at national and international levels (Cherp & Antypas 2003). There needs to be an informal relationship in addition to a formal one between the actors involved in the EIA process. It is assumed that, if there is a more cooperative atmosphere amongst the actors involved in the EIA process, the EIA system will be more effective.

Finally, this approach constitutes only partly the framework of an effective EIA system. This is because it focuses only on the organisational management aspects of an EIA and pays insufficient attention to the investigation of technical and scientific aspects of an EIA, specially the quality of an EIS and its contribution in the decision-making process. Furthermore, it does not take into account the implementation of mitigation measures at post-EIS stage, which is an important constituent of an effective EIA.

2.4.1.2 Decision making and quality of EISs approach

An EIA system is effective when the EISs influence decision makers to take environmental issues into account for project planning. Many studies are available that endorse this viewpoint (Blackmore, Wood & Jones 1997, Glasson 1999a, Hollick 1986, Leknes 2001, Sadler 1996, Weston 2000a, Weston 2002, Wood 1995, Wood 1999, Wood & Jones 1997). The central theme of this approach is that an EIA report should be prepared with objective and adequate information for decision makers so that they can take decisions based on a complete understanding of the consequences of the project (Benson 2003, Nilsson & Dalkmann 2001). The ultimate assumption here is that adequate technical and scientific assessment of evidence with accurate predictions of the environmental consequences will lead to better (more rational) decisions (Kornov & Thissen 2000). The decisions will result in either a rejection of the project or the proponents being allowed to go on with the project subject to modification of project design and/or implementation of mitigation measures to address the predicted impacts by the proponents during the construction and operation of the project (Dik & Morrison-Saunders 2002, Wood & Jones 1997).

This approach has some limitations. First, it is preoccupied with the consent decision being based only on the EIS². The advocates of decision making theory are criticised for their focus on the consent decision for approval of a project based on an EIA report and for ignoring the post-EIS stage of EIA (Cashmore et al. 2004). Preparation of an EIS

² Environmental impact Statement (EIS) or EIA report will be used interchangeably in this thesis.

and the consent decision based on it is only half way of the EIA process (Bailey 1997). Based on potential impacts predicted in an EIS, decision makers may reject or approve the project with conditions. The conditions may include that the proponents have to modify the project design to avoid or minimise impacts, or adopt appropriate mitigation measures to address environmental impacts. However, modification of a project design and the adoption of mitigation measures are not a guarantee that the EIA process as a whole is working effectively unless the mitigation measures are implemented at the post-EIS stage of EIA process (Lee, Walsh & Reeder 1994). The consent decision approach thus largely ignores the post-approval (post-EIS stage) stage where the substantive outcomes of an EIA occur in terms of the effective implementation of mitigation measures and the protection of predicted environmental impacts (Cashmore et al. 2004).

Second, EIAs can exert influence on decision makers in various ways, not just through consent decision and proposal development (Jay, Slinn & Wood 2007). Apart from the immediate influence of EIAs on a consent decision for a project, EIAs have a long term influence on decision makers in terms of conferring other important benefits. From the implementation of mitigation measures lessons are learned relating to the benefits of EIA, compliance with local rules and expectations of the local community. On a broader scale, an effective EIA system can play a role in the development of environmental awareness among stakeholders (Cashmore, Bond & Cobb 2007) and in creating social and environmental learning (Nooteboom 2007, Sadler 1996). An EIA also can influence policy makers to modify or reform institutional arrangements to make the EIA more effective (Ortolano & Shepherd 1995). Social and environmental

learning occurs at the post-EIS stage of the EIA process through the implementation of mitigation measures and monitoring.

Furthermore, the EIA needs to go beyond the mere consent decision so as to realize and harness its full potential and benefits (Bailey 1997, Glasson, Therivel & Chadwick 2005, Nitz & Holland 2000). The role of an EIA is not merely instrumental and the process is not linear. Rather, it is an iterative process and has an important transformative role (Sadar 1996). Therefore, the focus on the generation of good quality EISs and the modification of projects alone may undermine the realization of potential and ultimate benefits of EIAs that may arise from the post-EIS phase, usually through the implementation of mitigation measures (Bailey 1997).

Importantly, some authors underscore that the EIA plays a vital role as an environmental management tool (Bailey 1997, Glasson, Therivel & Chadwick 2005, Nitz & Holland 2000), where the responsibility of the EIA is to encompass comprehensive environmental management activities during the full life cycle of development actions. To understand an effective EIA system completely, we need to go beyond the consent decision, that is, we need to see the implementation of mitigation measures at the post-EIS stage of the EIA process. Study of this area relating to substantive outcomes of EIA is largely missing when trying to understand a complete and effective EIA system (Kennedy 1988, Noble 2000, p.105, Ortolano & Shepherd 1995, p.10; Sadler 1996).

The ability of an EIA (identified above) in producing more substantive outcomes (e.g. implementation of mitigation measures, stakeholders awareness) than simply consent decision and modification of project leads us to take a broader concept of an effective EIA system. As Cashmore, Bond and Cobb (2007) point out, these outcomes need to be incorporated into theory (and hence valued) so as to enhance the understanding of EIA effectiveness (Cashmore, Bond & Cobb 2007). A broader look at EIA effectiveness, including the post-EIS stage of EIA process, is necessary.

Third, the decision making approach assumes that the decision that is made which is based on EIS is rational, since the technical information provided in the EISs are value free. However, instead of a value-free world for information, a scenario of interwoven facts and values is the reality (Formby 1990, Nilsson & Dalkmann 2001, p.310, Owens, Rayner & Bina 2004). Decisions are likely to depend more upon other underlying interests, reflecting the norms and values of decision makers, who usually operate within a political arena (Jay, Slinn & Wood 2007). An EIA is a science as well as arts (Glasson, Therivel & Chadwick 2005). They are value-laden and ethical in nature (Lawrence 1997) and, therefore, are placed firmly within the socio-political realms of planning that usually seek to make a difference in decision-making (Benson 2003). Therefore, taking decisions on the basis of technical information is not always possible and, therefore, measuring the influence of EIA reports on decision makers may be misleading.

2.4.1.3 Contextual approach

Environmental assessment has been implicitly assumed to operate within an institutional, structural, and political vacuum under the decision approach of EIA (Cashmore et al. 2004). This tendency of trying to isolate contextual issues and favour a more technocratic interpretation of EIA effectiveness has already shown its limitations, as argued by Bina (2007), Boyle (1998), Hilding-Rydevik and Bjarnadottir (2007), and ‘Kolhoff, Runhaar and Driessen’ (2009). Cashmore, Bond and Cobb (2007) argue that contextual variables frequently influence EIA outcomes. Indeed, in several instances, contextual variables are considerably more influential than environmental assessment procedures (Cashmore, Bond & Cobb 2007).

The above approach recognises that the effectiveness of an EIA is context sensitive and that, therefore, the contextual issues should be taken into consideration in the assessment of EIA system effectiveness. According to Hilding-Rydevik and Bjarnadottir (2007), the style of policy and planning and, thus, the environmental assessment process relates significantly to the institutional environment (rules and regulations) and administrative set up (bureaucratic culture). These authors emphasise that even the micro level context (the context relating to every day professional practice) has a critical role in the integration of environmental issues in development planning (Hilding-Rydevik & Bjarnadottir 2007).

Moreover, Keysar and Steinemann (2002) find that, where the EIA process is well integrated in development policy and planning, the EIA process becomes more effective. Again, the integration of an EIA in planning and development depends on the

environmental leadership of relevant agencies, the internalisation of EIA concepts by proponents and other lead agencies in their planning process in addition to the timely study of EIA and its integration in the project cycle.

Furthermore, Hilding-Rydevik and Bjarnadottir (2007), and Boyle (1998) point out how the cultural context of a particular setting influences the practice and outcomes of an EIA system. According to Boyle (1998), while technical factors contribute directly to the consequent ineffectiveness of EIA, cultural factors provide complementary explanations. These include: reliance on paternalistic authority, hierarchy and status as the principles of social organisation; dependence on patron-client relationships for ensuring loyalty among political, bureaucratic, and private-sector actors; and, a strong desire to avoid conflict and maintain face; these all influence the practice of an EIA and the subsequent outcomes. The consideration of these cultural factors is particularly important when examining the difficulties of practice and implementation of an EIA (Boyle 1998).

Bina (2007), however, advocates for a broader contextual concept of EIA effectiveness. Bina (2007) defines the context that includes institution and organisational locations which are themselves studied within and influenced by a given society and its broader social, cultural, and political values. This contextual set up works as the backdrop of the effectiveness of an EIA system (Bina 2007). The EIA system works as a way to focus on the relationship between an institution, EIA process (planning) and, local context and, thus, maximize effectiveness. This relationship occurs in two ways, as pointed out by Lawrence (1997): an effective EIA system should adapt passively to the context in which it operates, and, concomitantly, it needs to reshape the context challenging

governing variables (Lawrence 1997). In this way, the EIA and context maintain a two-way relationship.

Bina (2007) also argues that the failure of the EIA in relation to planning and delivering environmentally sustainable development is closely linked to the limited environmental governance capacity of the machinery of government. The author proposes changes in the mindset of people who are directly and indirectly involved in EIA practice. Bina (2007) underscores the level of awareness among the actors involved in the EIA process. Furthermore, an effective EIA system also depends on the political will and the pro-environmental policy making at the central level of government (Bina 2007). Other authors (for example, Cherp 2000, Kolhoff, Runhaar & Driessen 2009, Morgan 1998) also agree with these views.

2.4.1.4 Social system approach

In a recent theoretical study of EIA effectiveness, Nootboom (2007) defined the effectiveness of the EIA as a phenomenon of large-scale social learning process. This includes acknowledgement of adaptive behaviour such as awareness that cooperation is needed in EIA procedure. According to Nootboom (2007), system (joint) thinking helps to analyse a situation and to develop an intervention that contributes to sustainable development. Under this model, the EIA is increasingly acknowledged as an instrument for positive feedback, contributing to a growth of cooperation for long term interest in social capital and government capacity. This approach proposes 'sustainable development as dependent on incremental steps that act as levers for breakthroughs to a next level of change or outcomes' (Nootboom 2007, p. 48).

Similarly, studies by Bartlett and Kurian (1999), and Cashmore (2004) state that an effective EIA system delivers the values of deliberative democracy, plurality in terms of participatory action and environmental justice (Cashmore 2004) that ensure the equity of the distributional effects of environmental benefits or negative impacts. This indicates that an effective EIA system may have the potential to change the existing values and norms of society favourably towards the environment. This allows people to incorporate environmental values into their culture. According to Cashmore (2004), at one extreme, EIA is applied science, but, at the other extreme, EIA is a civic science. He believes a change of society is a desirable outcome from an effective EIA system. Therefore, an effective EIA needs to incorporate not only the scientific materials, but also the broader social view where it operates.

These approaches, incorporated with the idea of broader social view, potentially offer a relatively wider and deeper understanding of the constructs of an effective EIA process. However, with the support of complexity theory it is very difficult to measure the effects of an EIA. First, the effects are mainly social constructs, abstract in type and therefore difficult to measure. Second, the social effects are incremental in nature and, therefore, changes take place slowly over a long period of time (Bartlett & Kurian 1999). Third, an EIA produces an effect on the development in a very indirect way. For these reasons, an independent assessment of EIA effectiveness based on facts is quite impossible.

2.4.2 A comparison of approaches of an effective EIA system

No individual approach, as discussed above, is exhaustive in constructing and evaluating an effective EIA system. Each approach helps to explain an effective EIA system, but only reveals a partial picture. Despite some limitations, each of the approaches has individual strengths. A combination of the strengths of these approaches can address their shortcomings and may lead to the development of a strong and complete framework for an effective EIA system. These approaches, however, are not necessarily mutually exclusive. They are complementary and interactive. It is, therefore, imperative to integrate the approaches. This can lead to understanding a comprehensive picture of an effective EIA system.

With this in mind, Cashmore, Bond and Cobb (2007) underscore that the importance of a holistic outlook with a comprehensive conceptualization of an effective EIA system must not be neglected in future research work (Cashmore, Bond & Cobb 2007, p.528). It is imperative, therefore, that there should be more integrative research that adopts a holistic approach towards constituting an effective EIA system. Cashmore (2004) asserts:

‘...reductionist research is important but it is also necessary to consider concurrently the relationship between the variables as: context; procedural provisions and practices, interface between EIA and causal process, the influence of outcomes, actions and attitudes; and the accuracy of predictions and utility of mitigation’(Cashmore 2004, p.421).

Empirical studies explicitly using the holistic view in EIA system evaluation are rare in EIA literature. A reductionist view that takes into account a component of the EIA system only cannot see the whole problem. It only identifies the problem by reducing it into smaller parts. On the other hand, a holistic view facilitates identification of

problems from a broader context and helps to find an appropriate solution. Therefore, we need to move from mere component analysis to more holistic approaches wherein interactive, integrative and emergent properties are included (Odum 1977, p.195). This holistic view allows researchers to explore complex behaviour through a detailed investigation of its components and their interactions. Finally, going beyond a reductionist view to holistic view is now mandated if we want to have insight into the whole EIA system.

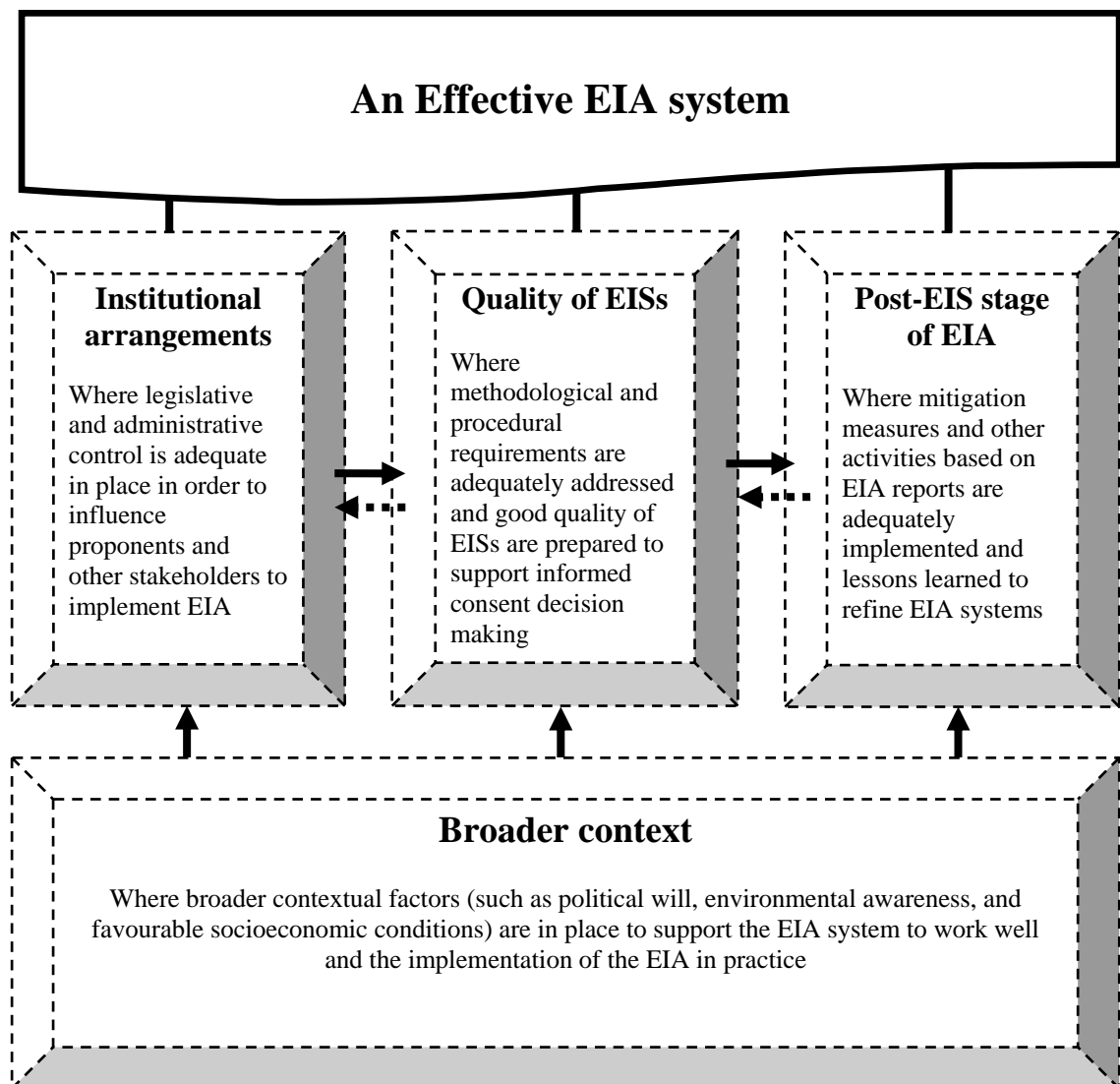
2.4.3 The proposed framework

In this study the holistic framework (Figure 2.2) derives from the integration of previously reviewed approaches including institutional aspects, the quality of an EIS and the consent decision, contextual aspects, and complex social systems. In addition, there is a need to integrate the post-EIS stage of the EIA process in order to have a complete understanding of an EIA system. Thus, the evaluation of the EIA system using these approaches, together with post-EIS stage of the EIA process gives us a broader picture. Indeed, putting the essence of these models together under one umbrella provides a framework of broader understanding of an EIA system.

Importantly, this approach provides a frame of reference for an effective EIA system. The approaches discussed here and their inter-relationships lead to an effective EIA system. This holistic approach respects the interdependence of these key components where the institutional arrangements, the quality of EISs, and the implementation of mitigation measures are mutually interdependent. The approach recognises that an adequate institutional arrangement can lead to an effective EIA process that generates a

good quality EIA report. The presence of an adequate institutional arrangement and quality EIA report may lead to an adequate implementation of mitigation measures and lessons learned (substantive outcomes). Above all, the broader contextual factors work as a backdrop to strong institutional arrangements, quality EISs, and implementation of activities at the post-EIS stage of the EIA process.

Figure 2.2: A conceptual framework of an effective EIA system: an integrated-holistic approach



Moreover, the above approach helps to understand the effective EIA system by evaluating both procedural outcomes and substantive outcomes, in addition to institutional arrangements required to operate and implement the EIA in practice. The institutional arrangements indicate the operational capacity of the environmental agency along with legislative control. The quality of an EIS indicates procedural outputs and indicates to what extent the stages and activities of the EIA process (e.g. collection of baseline data, identification and assessment of impacts, alternative analysis, and community participation) are performed properly by the proponents. The post-EIS stage of an EIA reflects the substantive outcomes in terms of the implementation of mitigation measures with a view to addressing the potential environmental impacts. The holistic approach considers that adequate institutional arrangements, good quality EISs as the product of the EIA process, and adequate implementation of mitigation measures are core areas of an effective EIA system.

Contextual issues influence the success and failure of the EIA system. The absence or the inadequacy of contextual factors may limit the effectiveness of an EIA system in general and institutional adequacy, quality of EISs, and implementation of mitigation measures in particular. An EIA system with adequate institutional arrangements, the production of good quality EIS, and the proper implementation of mitigation measures depend on the broader jurisdictional context (Wood 1995).

The holistic approach also recognises that the EIA is an iterative process. The outcomes that occur from the post-EIS stage exert an influence on decision makers to take necessary action to adjust the institutional arrangement and to improve the quality of

EISs. The lessons learned from the implementation of mitigation measures may have multiple effects in both the short term and long term. The immediate effects are the modifications of EIA provisions and an increase in environmental awareness and policy reforms that reflect the result of the broader decision making process.

2.5 Key areas and criteria for evaluation of the EIA system in Bangladesh

In line with the above integrated-holistic conceptual framework, this study aims to look at three key areas of the EIA system: the institutional framework (arrangements); the quality of EISs; and, the post-EIS stage of the EIA process. In the context of Bangladesh, the importance of the evaluation of these three key areas is further illustrated here.

2.5.1 Institutional framework of the EIA system

The institutional arrangement is one of the fundamental determinants of an effective EIA (Lee 2000a, p.31, Sadler 1996, p.78). An effective EIA system depends on legal (laws, rules, regulations and traditions) and administrative (EIA procedures, administrative structures, the roles and responsibilities of agencies, resources, and capacity arrangements. In fact, the strength of the legal mandate of EIA institutions is a measure of the level of a country's commitment to an effective EIA system (Lohani et al. 1997). It is necessary to scan the current legislative arrangements since an inadequate and ambiguous legislation may impose substantial costs, uncertainty in the application of EIAs and cause delays in achieving objectives.

In order to be effective, an EIA system needs also to be accompanied by adequate administrative arrangements (Abaza, Bisset & Sadler 2004, Ebijemiju 1993, Wood 1995). Therefore, a review of the responsibilities, roles and structures of formal and supportive institutions involved in the EIA process and their capacities for managing EIA practice is also essential. Such a review helps to identify the gaps and strengths of existing institutional arrangements. This also helps in the selection and development of appropriate mechanisms and responsible authorities at various levels of governance in order to co-ordinate the implementation of an EIA.

Furthermore, the reason behind the study of institutional arrangements in Bangladesh is that, in Bangladesh, the EIA system is relatively new. Therefore, institutional arrangements are likely to be weak as in so many other developing countries. However, there was no major review of legal and administrative arrangements of the EIA after its formal introduction in Bangladesh in 1995. So it is not unlikely that the institutional arrangements of EIA system in Bangladesh will have some deficiencies. These limitations need to be explored such that suggestions can be made for adequate institutional arrangements in order that the EIA be successfully implemented.

2.5.2 The quality of EISs

An EIA report is the most important and tangible output of the EIA process. Therefore, the effectiveness of the EIA system of a country depends largely on the quality of the EIS (Lee et al.1999, p.7). Fuller (1999) argues that the EIS is the product of the EIA process and, as such, the quality of the document is likely to be closely associated with the quality of the whole EIA process. This can be supported by the findings of the

empirical study of Wende (2002) where she shows that there is a clear relationship between the quality of EISs and the effectiveness of the EIA system.

The quality of EISs as the vital element of EIA practice mirrors the effective implementation of the methodological and procedural requirements of the EIA process in practice (Fuller 1999, Modak & Biswas 1999). An EIS as the product of the EIA process contains information on how the key stages of an EIA (for example, scoping, collections of baseline data, identification and assessment of impacts, analysis of alternatives) are addressed in practice. An EIS also contain information about mitigation measures that address the predicted impacts and monitoring. Therefore, high quality EISs as the products of the EIA process, often represent an effective EIA system. It is the fundamental indicator of an effective EIA system that the information presented in the report reflects the technical and scientific quality of the EIA process (Pinho, Maia & Monterroso 2007).

A number of studies were conducted in both developed and developing counties on EIS quality (Badr, Cashmore & Cobb 2004, Badr, Zahran & Cobb 2011, Glasson, Therivel & Chadwick 2005, Pinho, Maia & Monterroso 2007, Samarakoon & Rowan 2008, Sandham & Pretorius 2008, Weston 2000b). These studies identified deficiencies in the contents of EISs, determined factors influencing the quality of EISs, and suggested improvements in the quality of EISs. Therefore, after the analysis of institutional requirements of an EIA system, it is imperative to look at the quality of EISs as a key aspect of the EIA system in Bangladesh.

2.5.3 Implementation of mitigation measures

An effective EIA system is also characterised by the proper implementation of mitigation measures along with monitoring and community participation. This is important since these post-EIS activities are an integral part of an effective EIA system (Marshall 2001, Wilson 1998). It is argued that adequate institutional arrangements and the good quality of EISs alone cannot guarantee the protection of the environment (the ultimate aim of an EIA). It is integral that the mitigation measures recommended by EIA reports are adequately implemented (Noble & Storey 2005). The effective implementation of mitigation measures occur when all mitigation measures recommended by the EIS are completely and adequately implemented (Wood 1995). It is the effective implementation of the mitigation measures that occur at the post-EIS level that can make a project environmentally sustainable (the desired substantive outcome of an EIA) (Cashmore et al. 2004).

In Bangladesh, the underlying philosophy of the application of EIAs is that they are not intended to prevent actions with significant environmental impacts from being implemented. Rather, the intention is to go ahead with the project. With this in mind, an environmental management plan (EMP) is included in project planning in order to minimise the predicted environmental impacts. Furthermore, literature shows that an EIA takes place in a wider decision making political context (where economic growth, employment generation are important, particularly in developing countries) rather than simply consent decisions. In this context, one of the best strategies is to approve projects that include strict conditions involving the implementation of mitigation

measures as recommended by EIA consultants. Therefore, the implementation of mitigation measures that occurs at the post-EIS stage of EIA process is, essentially, a key area for investigation in the context of Bangladesh.

There have been a number of studies undertaken in developed countries (for example, Bailey 1997, Marshall 2001, Morrison-Saunders & Bailey 1999, Muretta & Price 1982, Ortolano & May 2004, Wilson 1998) on the implementation of mitigation measures. There are a limited number of studies on the implementation of mitigation measures in developing countries, for example, Sanchez and Gallardo (2005) in Brazil, and Slinger et al. (2005) in South Africa, and Nadeem and Hameed (2011) in Pakistan. Therefore, the study of the post-EIS stage of the EIA process is a key area of this research. This means that the ultimate goal (protection of environmental impacts of a project) of an EIA is achieved largely through the successful implementation of mitigation measures.

2.5.4 Use of criteria to evaluate the EIA system in Bangladesh

The application of criteria is becoming the prominent way of evaluation (Wood 1995). Evaluation criteria are essentially a checklist of the requirements of an effective EIA system. These criteria are generally said to be normative provisions with which an EIA system should accord (Emmelin 1998a, Fuller 1999) and they should be followed in practice. These good practice review criteria, as applied by a number of authors (such as Glasson & Salvador 2000, Sadler 1996 and Wood 1995), are well established and appear to be applicable to most jurisdictions. This study has used a set of criteria to evaluate the EIA system in Bangladesh (details in Chapter 3).

2.6 Evolution of the EIA system in Bangladesh

Before Bangladesh became independent from West Pakistan (currently Pakistan) in 1970, there was a law to protect environmental pollution called the *Water Pollution Control Ordinance* of 1970 (Government of East Pakistan 1970). This ordinance on water pollution was the first legislation for the control, prevention and abatement of the pollution of waters in East Pakistan (renamed Bangladesh). A Pollution Control Board comprising the executive chiefs (secretaries) of concerned ministries was established to implement the ordinance. There was a provision for the punishment of noncompliant actors according to the ordinance. After the liberation of Bangladesh, this ordinance was rightly repealed and replaced by the *Environment Pollution Control Ordinance*, 1977 (GOB 1977). This ordinance had broader scope than the previous one as it incorporated not only the control of water pollution, but also other elements of environmental components such as air and soil. However, these pollution control laws did not mention the requirement of EIAs for development projects.

The evolution of the EIA dates back to the implementation of development projects in the 1960s in the water resource sector. Following the extensive floods in Bangladesh (East Pakistan) in 1954, a preventive strategy was taken by the government based on the recommendation of the *Krug Mission Report and East Pakistan Water and Power Development Authority* (EPWAPDA). The aim was to protect the agricultural lands against the average annual flood conditions in flood-prone area through the construction of embankments along the major riverbanks and coastal development. This was the first massive intervention in, injection of, and construction of water resource development projects in Bangladesh.

After the liberation war and the independence of Bangladesh being attained in 1971, the government endorsed this 'modernisation approach' and was quite uncritical of social and environmental aspects as there was no provision for EIAs. However, after the implementation of the projects, a number of studies were conducted by interested researchers to assess the environmental and social impacts of these projects in the early 1990s (Alexander et al. 1998, Boyce 1990, Brammer 1990, Haque & Zaman 1993, Muhammad 2004, Thompson & Penning-Rowsell 1994). The findings of these studies reveal that these projects, as implemented in the 1970s and in the early 80s, created economic benefits in the short term, but failed to ensure an environmentally and socially sound economy in the long run.

One of the projects, the Meghna-Dhonogoda project that was implemented in 1978 in the Chandpur District area, brought immense misery to thousands of people because of severe ecological, social and cultural damage (Thompson 1990). The project caused a substantial reduction in fish production in the flood plains, thus adversely affecting the fishermen (Alexander et al. 1998, Mirza & Erickson 1996, Naser et al. 1989, Ullah 2002, p.83). There were other direct environmental and social impacts (Muhammad 2004, Naser et al. 1989). Ultimately, the overall benefits of the projects were overshadowed by the extensive social and environmental costs. There was no provision of EIAs during the planning of these projects. This was a lesson both for the government of Bangladesh and the donor agencies.

In the late 1980s, the first EIA was introduced in Bangladesh on an ad-hoc basis under the Flood Action Plan (FAP) (FAP-16 component) with the support of donor agencies, particularly the World Bank and Asian Development Bank. Following the long flood in 1988, the government of Bangladesh adopted multibillion dollar projects under the FAP to control and prevent floods. The development approach was, in fact, the continuation of a previous scheme that is known as Krug Mission's Master Plan for flood control. As there were adverse environmental and social impacts from the construction of embankments for flood control that occurred in the past, academics and environmentalists demanded that the negative environmental and social impacts of ensuing projects under the FAP had to be resolved at the planning stage (for example, Custers 1993, James 1992, Mirza & Erickson 1996, Thompson 1990, Zaman 1993,).

In response to recommendations made by academics and environmentalists from home and abroad, lessons learned from past experience, and pressure from donor agencies, the government of Bangladesh incorporated EIAs to study the environmental and social impacts under the FAP. The first EIA guideline was prepared as part of the FAP-16 in 1992 to assess the ongoing and future FAPs and similar water management projects (FPCO 1992). Since 1992, the EIA has been applied on an ad-hoc basis (project by project) based particularly on the donor's demand. The application of EIAs was not mandatory for the development proponents until the enactment of the Environmental Conservation Act (ECA) in 1995.

In fact, the form of the application of EIAs in planning development projects was not realised until the adoption of EIAs under the FAP in Bangladesh. In 1992, the government of Bangladesh introduced the National Environmental Policy. In 1995, the government enacted the ECA making the application of EIA mandatory. The government prepared Environmental Conservation Rules (ECR) in 1997 with detailed requirements for EIAs and thereby endorsed the ECA. In addition to donor support and domestic pressure from civil societies, such as the Bangladesh Centre for Advanced Studies (BCAS), and the International Union of Conservation of Nature (IUCN) office in Bangladesh, the Rio Declaration in 1992 influenced the government to enact formal EIA provisions.

2.7 Status of the EIA system in Bangladesh and the research gap

There are detailed studies on the EIA systems in some developing countries (Lee & George 2000, Lohani et al. 1997, Modak & Biswas 1999, Wood 2003). The findings of these studies provide an idea of the status of an EIA system in developing countries. However, despite the contextual similarity and basically similar components of the EIA system, these findings may not fulfil the expectations of decision makers of particular countries of concern. This is because the extent of the problems and deficiencies in EIA practice is variable from country to country. Every EIA system is distinctive in a particular country of context (Petts 1999, p.5, Thomas 2005). Therefore, any policy advice on EIA application and improvement of an EIA system should be country specific (Cherp 2000, p.371). Taking all this into account, an investigation of the EIA system in the case of Bangladesh is warranted.

Current literature recognises that there is no doubt (at least theoretically) about the role of an EIA in making a project environmental friendly (Gilpin 1995, Momtaz 2005, Petts 1999, Wood 2003). Therefore, in order to harness the benefits of EIA, all developed countries and some developing countries (for example, South Africa, Brazil, Indonesia, Philippines, and China) have reviewed their EIA systems in detail and have developed better EIA systems. However, the role of EIA and the potential benefits of the EIA system in many developing countries including Bangladesh is still not well recognised or unknown. One of the reasons behind this is the lack of systematic scientific information about the EIA system.

Although the EIA was legally established in 1995 in Bangladesh, no systematic and comprehensive research has yet been done. A few attempts were made such as by Ahammed & Harvey (2004), Momtaz (2002), Momtaz (2003), and Momtaz (2005) to understand the status of the EIA in Bangladesh. These studies focus predominantly on institutional (and to some extent procedural) issues and, therefore, provide only a partial view of the EIA system. According to Momtaz (2002), in order to understand the effectiveness of an EIA at full scale, a thorough understanding of the relationship between the EIA and environmental protection assurance in the context of Bangladesh is necessary (Momtaz 2002, p.178) in addition to institutional aspects. Momtaz (2005) also underscores this by saying:

‘A major review of EIA (and SIA) in Bangladesh needs to be conducted to find out how EIAs have been implemented since the enactment of ECA, 1995; how recommendations of those EIAs have been adopted by the proponents; whether and how mitigation measures were implemented; and finally, whether EIAs have been able to ensure environmental and socially sound development projects’ (Momtaz 2005, p.43).

Furthermore, there is no provision of a routine assessment of EIA effectiveness in Bangladesh at the government level. In many countries, (for example, the EIA Directive in EU countries) the EIA is regularly reviewed and the legislation, the administrative set up and the ways of practice are modified. In Bangladesh, due to the lack of detailed scientific information, no significant improvement of the EIA has been made since 1995. Notably, in the absence of a detailed study, we still do not fully understand whether the EIA system in Bangladesh is complying with good practice and fulfilling its intended objectives. Therefore, it is important to examine the EIA systems more closely and comprehensively. This will help to identify the actual barriers and realistic opportunities for the optimization of this management tool.

Bangladesh is a country in economic transition with an average of more than 6% economic growth during the last decade. At this stage of development, it is imperative to understand the EIA system. Since the implementation of an open market economy in early 1990s, there has been an increase in investment, particularly in industrial and infrastructure sectors. The country is blessed with coal and gas mines. In recent times, investment has been growing in this sector so as to explore and exploit the mineral resources. Since all these development activities entail ecological and social impact, an effective and up-to-date EIA regime is essential as an environment management tool in Bangladesh.

2.8 Chapter summary

The aim of this chapter was to review the existing literature on EIA and the development of a conceptual framework (integrated holistic approach) to evaluate the EIA system in Bangladesh. In this chapter, existing approaches for the evaluation of an EIA system were analysed and a conceptual holistic framework was developed to evaluate the EIA system in Bangladesh. Finally, the evolution and status of the EIA in Bangladesh was discussed and the research gap emerged. The next chapter discusses the research design, along with methods used to collect data for this research.

Chapter-3

Research methodology

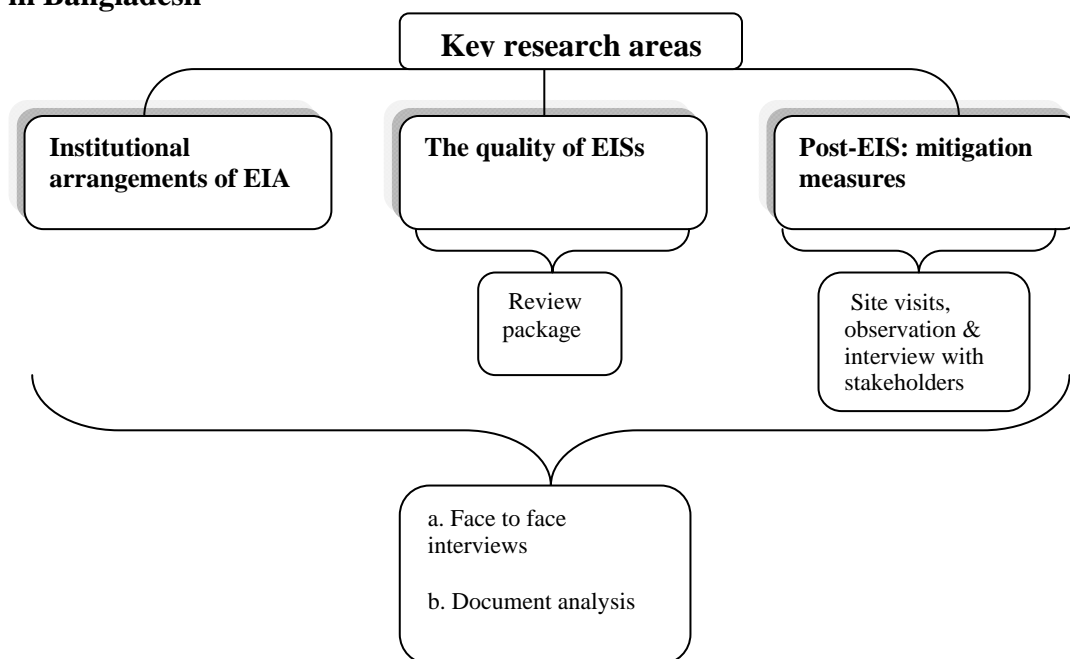
3.1 Introduction

This chapter describes the methods of data collection used in this study. Section 3.2 outlines the design of this research, which involves the key areas of investigation and the methods of data collection used for each area. Section 3.3 then describes a set of criteria used to evaluate the EIA system in Bangladesh. Section 3.4 provides a description of the methods for data collection in details. These methods include: face to face interview, document analysis, use of review package, and site visits and direct observation. Section 3.5 details how data was analysed using tools and techniques. Finally, Section 3.6 features how the quality of this research was controlled. Section 7 provides some operational difficulties faced by the researcher during fieldwork. This is followed by a summary of this chapter.

3.2 The research design

This empirical qualitative study was undertaken to address research questions principally with respect to three key areas of an EIA system: (1) institution and EIA practice, (2) the quality of EISs, and (3) the implementation of mitigation measures at the post-EIS stage of the EIA process. Figure 3.1 shows the research design of this qualitative study along with the key areas of investigation and relevant methods for data collection (Figure 3.1).

Figure 3.1: Key areas investigated and methods applied to review the EIA system in Bangladesh



Source: Developed by the researcher

The methods applied for data collection in this study include: face to face interviews; document analyses; review package; and, site visits including direct observations. Two methods (interview and document analysis) were used to collect data to analyse institutional arrangements in addition to other two key areas of investigation. The review package was applied to assess the quality of EISs only. The use of site visits along with direct observation and discussion with stakeholders was aimed at understanding the implementation of mitigation measures in three projects (case studies). Overall, the application of different methods of data collection strengthened the ‘richness of data’ and ‘depth of description’- two necessary features for good

qualitative research. The details of key areas of investigation and the subsequent methods required to collect data are described in the next sections.

3.3 Evaluation criteria for the EIA system in Bangladesh

Many authors have been referencing good practice criteria to evaluate EIA systems, including: Ahmad and Wood (2002), Fuller (1999), Glasson & Salvador (2000), Hollick (1986), Leu, Williams and Bark (1996), Morgan (1998), Sadler (1996), Wood (2005), and Wood and Bailey (1994). The criteria used by these authors reflect the requirements of an effective EIA system. Wood (1995) used a set of criteria to evaluate the EIA systems of six developed countries. Sadler (1996) used a set of criteria to review the EIA system internationally. Leu, Williams and Bark (1996) used a set of criteria to evaluate the EIA system in Taiwan. Glasson & Salvador (2000) used a set of criteria to evaluate and compare the EIA systems in England and Brazil.

The application of these criteria is now widely recognised and established as the requirements of good EIA practice in evaluating EIA systems. The use of a set of criteria and the number of criteria depend on authors' own perspective and focus. Therefore, no set of criteria is exhaustive. With this in mind, a set of criteria (Appendix-A) was developed based on the above mentioned authors to evaluate the EIA system in Bangladesh. Box 3.1 shows the summary of these criteria. In general, these criteria focus on the requirements and operation of the EIA system, including institutional arrangements, EIA procedure (quality of EISs) and the post-EIS stage of the EIA process. In this research, data was collected, analysed and interpreted in the light of these criteria.

Box-3.1: Summary of criteria used to evaluate the EIA system in Bangladesh

Institutional arrangements:

1. Clear legal basis of EIA system
2. Provisions of EIA requirements adequately prescribed by the legislation
3. Adequate technical and general EIA guidelines
4. Separate environmental agencies with adequate authority
5. Adequate resources and capacities of environmental agencies for implementing EIA in practice
6. Adequate interagency coordination between the environmental agency and other proponents
7. Other control mechanisms, such as an environmental court, code of conduct for EIA consultants

Quality of EISs

8. All relevant stages of EIA process are adequately addressed in practice
9. A competent authority is available to review and approve EISs
10. The EISs are able to be understood by all stakeholders
11. There are resources available to prepare good quality EISs (funds available, expert EIA consultants and adequate time for EIA study).
12. There is a code of conduct and accreditation system for EIA consultants to control the quality of EISs
13. The review of EISs is participatory and independent of an environmental agency

Implementation of mitigation measures

14. Recommended mitigation measures adequately implemented to address the predicted impacts of the projects
15. An adequate role is played by the environmental agency in successfully implementing the mitigation measures
16. Adequate monitoring activity during the implementation of mitigation measures
17. Active community participation during the implementation of mitigation measures
18. Role of other stakeholders (for example, donor agencies, Planning Commission) available to support the implementation of mitigation measures.

Broader contextual factors

19. Political will favourable to environmental issues
20. Bureaucratic and developmental culture

Sources: Fuller 1999, Sadler 1996, Wood 1995, Wood & Bailey 1994

3.4 Methods of data collection

3.4.1 Face-to-face interview

The interview is a dominant method used in qualitative research (Flick 2007). It is a widely used method for collecting information about an event (Dunn 2005, p.80) and for helping researchers to get insights about the event. Interviews focus on the ‘lived experience’ of the stakeholders, particularly thoughts, feelings, beliefs and values of a phenomenon (Marshall & Rossman 2006, Ruane 2005, p.149). Interviews also capture the richness and complexities of issues and allow the respondents to ‘pour out’ their thoughts. Although interviews are usually considered a descriptive tool, they also provide a basis for ‘explanation’ of how and why a phenomenon does or does not work (Haas & Springer 1998, p.32).

To understand the practice of the EIA (a phenomenon or an event) and its subsequent outcomes in real life, it was important to understand the experiences of stakeholders and the value the stakeholders place on the EIA system. The application of the interview method in this study not only provided the descriptions about EIA in the context of Bangladesh, but also explored the causes of why the EIA system does or does not work well, and, ways to improve the EIA system. Therefore, in this case, the interview was one suitable method for providing detail about the EIA system in Bangladesh.

During the interview, the interviewer has the opportunity to probe the interviewees in order to gain clarification, seek more detailed information and observe the underlying motives and gestures of interviewees (Gray 2009, p. 373, Robson 1993, p. 229). In this study, this technique (probing) was successfully applied by the researcher during the interview to increase the depth of content of a particular EIA issue and to increase the

clarity of the statement of interviewees. This is an important advantage of the interview method as compared with the questionnaire survey where probing by interviewers is impossible.

Self-administered face-to-face interviews were conducted in this study. Dunn (2005) suggests that the relationship between interviewer and interviewees is often critical to the collection of opinions on a phenomenon such as EIAs (Dunn 2005, p. 91). Only the use of face-to-face interviews has the possibility of establishing this relationship as the interviewer directly interacts with the interviewees. Face-to-face interviews also facilitate interviewers in controlling the interview process under close supervision, which is not possible when using other techniques, such as the telephone interview. Self-administered face-to-face interviews thereby helped to maximise the quality of the interview process, as well as the quality of information.

The questions in the interview schedule covered a range of questions, with particular reference to the institutional arrangements of the EIA system, the quality of EISs as the product of the EIA process and the implementation of mitigation measures. The researcher discussed with each interviewee a range of questions in the interview schedule. In response to the questions, the interviewees gave their views and opinions based on their experiences. The underlying objectives of these questions were to understand the current EIA system in Bangladesh, EIA's strengths and weaknesses, the causes of weaknesses and what can be done to address the weaknesses of the current EIA systems in Bangladesh. To conduct face-to-face interviews successfully a predesigned set of questions or interview schedule was important.

3.4.1.1 Interview schedule: why

To capture and understand the ‘deeper perspective’ of EIAs, an interview schedule (Appendix-B) was used in this study. The in-depth interviews schedule provided a greater breadth of data (Fontana & Frey 2000, p.652) than other types of interviews, such as the structured interview. The interviewees had the opportunity to provide as much information as they could. An interview schedule was suitable for uncovering the key insights of the phenomenon (Dunn 2005, p.82) in order to understand how the EIA system was working in Bangladesh. Use of such a tool not only helped to explore the topic in depth, but also to obtain quotable material (Bradburn, Sudman & Wansink 2003, p.152).

Pre-testing the interview schedule: Authors such as Ruane (2005), and Bradburn, Sudman and Wansink (2004) state that every interview schedule must be tested in real world conditions in order to determine whether the required information is obtained both completely and clearly (Bradburn, Sudman & Wansink 2003, p.317; Ruane 2005, p.141). It was therefore necessary to conduct a pre-test of the interview schedule used in this study. Five participants were contacted and interviewed for this purpose. It was found that some of the questions of the interview schedule were not clearly understood and not answered by the interviewees in a useful way. The questions in the interview schedule were revised and rephrased, therefore, where necessary. Ambiguous words in the questions were avoided and worded carefully to make questions specific and precise. The order of questions was also reorganised to make it logical so that questions could motivate interviewees to answer freely, accurately and thoughtfully with a smooth

flow. Finally, the modified questions based on the pre-test were used to obtain the information required to achieve the research objectives.

3.4.1.2 Choice of sampling technique, sample size and selection of interviewees

3.4.1.2.1 Purposive sampling

The purposive sampling strategy was applied in this study to select the potential interviewees. Purposive sampling is a dominant strategy in qualitative research when, according to Flick (2007), ‘...we look for participants with long experience on the issue we want to interview them about or those who are really in the position to apply the professional practice we are interested in’ (Flick 2007, p.28). This means that the logic and power of purposeful sampling lie in the selection of information rich participants to illuminate the questions of interest, rather than the number of participants (Russell & Gregory 2003).

Notably, interviewing the information-rich participants yields insights and an in-depth understanding about a phenomenon (Patton 2002, p. 230). In this study, information on EIAs was obtained from key informants who have adequate knowledge and experience of the EIA system in Bangladesh. Therefore, purposive sampling was an appropriate choice for selecting the participants for interview.

3.4.1.2.2 Sample size and selection of participants

There are no strict criteria for sample size in qualitative studies (Patton 2002, p.244). According to Marshall (1996) an appropriate sample size for a qualitative study is one that adequately answers the research question. Here, researchers judge the appropriate size of a sample for a given study by how comprehensively and completely the research

questions are answered (Marshall 1996). Based on this principle, 30 interviewees were purposively selected for collecting information for this study.

The interviewees included EIA consultants, government officials, experts and researchers from consulting firms, government agencies, particularly from ministries and the Department of Environment (DOE), non-government organisations (NGOs), international organisations (World Bank and Asian Development Bank), research institutions, and university academics. A 'statement of information' (Appendix-C) was sent inviting the potential interviewees to participate in an interview. The statement explained the research objective and the rights and responsibilities of the interviewees. A consent form (Appendix-D) was also sent to the potential interviewee to obtain informed consent. A total of 30 participants responded that they were prepared to attend a one-hour interview. Finally, a total of 25 participants were available for interview and all of them were interviewed (Appendix-E).

3.4.1.3 Conducting interviews and recording data

To conduct the interviews systematically and successfully, an interview protocol was followed (Box 3.2) in this research. After receiving consent from the potential interviewees, they were contacted over telephone and emailed so as to fix the date, time and place of interview. They were then interviewed according to the agreed time, date and place. The interviews were generally held in the office room of the interviewees in order to maintain privacy. They were assured that their information would be disclosed and presented anonymously in the thesis. Therefore, the interviewees were able to be candid in expressing their views on the EIA system in Bangladesh. Each interview generally lasted for 60 minutes, and ranged from 30 minutes to 120 minutes in duration.

Box 3.2: Interview protocol followed in this study

Interview Protocol

Prior to Interview

1. Identify interviewee and collect essential background information about them.
2. Contact them to assess their willingness to receive a statement of information and consent form.
3. Obtain informed consent and arrange date and time of interview.
4. Send interview questions ahead of interview.
5. Request permission for interview to be recorded using audio recorder.

During Interview

1. Provide background information, in brief, on the project.
2. Re-ensure confidentiality of the interviewee's information.
3. Re-confirm permission to record, confidentiality and transcript to be provided.
4. Check digital voice recorder and conduct voice test, and put the tape recorder nearby as a backup.
5. Listen to the interviewee throughout interview and take notes.
6. Identify any action to be followed up.
7. Request permission to follow up issues by telephone/face to face/e-mail later.

After Interview

1. Write up contextual interview notes.
2. Complete fact sheet information and enter into database.
3. Listen to recorded interview to be transcribed.
4. Write letter of thanks to interviewees.
5. Check and edit transcript.
6. Enter factual content information from interview into database (key people, place, dates and events).
7. Save transcript and notes in WORD file ready to enter into Nvivo8 software.

Sources: Prepared by the author after Patton 2002

Interview data was recorded by using appropriate tools. Authors such as Patton (2002) and Dunn (2005) say that a tape recorder is ‘indispensable’ to recording interview data, although relying on a tape recorder or written notes is a matter of personal preference (Dunn 2005, p.95; Patton 2002). In this study, a digital voice recorder was used as it had the advantage of capturing data correctly and completely rather than hurriedly taken notes. A tape recorder was also used as a backup. In addition, the researcher took notes simultaneously so as to capture the gist of the statements provided by the interviewee. The researcher’s observations relating to conduct of the interview, such as gestures of the interviewees and the key issues that were emphasised by the interviewee, were also noted down. These notes were useful in generating ideas during the analysis of the data. Figure 3.2 shows the tools that were used to record data during the fieldwork.

Figure 3.2: Tools used to record observational and interview data



(a) Field notes

(b) Digital voice recorder and tape recorder

3.4.2 Document (content) analysis

The rationale for document analysis lies in its role in methodological and data triangulation and the immense value of documents in case study research and interviews. Documents provide background and context, and supplementary data for the

verification of findings (Bowen 2009, pp. 29-31). Document analysis provides a behind-the-scenes look at the program that may not be directly observable and about which the interviewees might not recall, or the interviewers might not ask (Patton 2002, p. 306).

Table 3.1: Types of public documents analysed in this study

Sl. No.	Key research areas	Types of public documents	Purposes
1	Institutional arrangements of EIA system in Bangladesh	(a) Legislative documents such as National Environmental Policy 1992 (b) Environmental Conservation Act 1995 (c) Environmental Conservation Rules of 1997 (d) Available EIA guidelines of different sectors in Bangladesh, EIA guidelines of ADB and WB.	1. To analyse the adequacy of institutional arrangements of EIA in Bangladesh 2. To investigate the coverage and clarity of EIA requirements by means of legislations
2	Quality of EISs	Thirty (30) Environmental Impact Statements of different sectoral projects namely energy sector, industrial sector, water resource sector, and infrastructural sector.	To analyse the coverage and the quality of information reported by the EISs.
3	Implementation of mitigation measures	(a) Khulana-Jessore Drainage Rehabilitation Project (KJDRP) documents, monitoring and evaluation documents, project completion report. (b) Meghnaghat Power Plant (MPPP) project documents, monitoring and evaluation documents, project completion reports, Mid-Term evaluation report. (c) Jamuna Multipurpose Bridge Project (JMBP) documents, monitoring and evaluation documents, project completion reports.	1. To analyse what mitigation measures were recommended by the EIA reports. 2. To understand the status of implementation of mitigation measures, monitoring and community participations.

In addition to peer reviewed journal articles, international reports and text books this study analysed a number of public documents relating to the EIA in Bangladesh (Table 3.1). Public documents in this study thus played a vital role as a valuable source of data, as they provided context and background information on EIAs in Bangladesh (Bowen 2009, p. 290). Data drawn from these documents contextualised other data collected during the interview, as well as the observation of the status of mitigation measures implemented at the three project sites.

3.4.3 Review package for the assessment of the quality of EISs

In this study the quality of EISs was reviewed following the review procedure developed by Lee and Colley (1992). The Lee and Colley (1992) method has been widely used by researchers (for example, Badr, Cashmore & Cobb 2004, Badr, Zahran & Cashmore 2011, Barker & Wood 1999, Canelas et al. 2005, Cashmore, Christophilopoulos & Cobb 2002, Glasson et al. 1997, Gray & Edward-Jones 2003, Hickie & Wade 1998, Hughes & Wood 1996, Pinho, Maia & Monterroso 2007, Sandham & Pretorius 2008, Simpson 2001,) as shown in Table 3.2.

Table 3.2: Methods used by authors to assess the EISs' quality

Authors	Assessment methods and sectors	Grading procedure
Sandham & Pretorius (2008)	Reviewed the quality of 28 EISs of different sectors in South Africa using review criteria	Used alphabetic symbols to grade each criteria, where: A = Well performed, B = Generally satisfactory, C = Just satisfactory, D = Just unsatisfactory, E = Poorly attempted, F = Did not attempt
Pinho, Maia & Monterroso (2007)	Assessed quality of EIS of small hydropower projects in Portugal using review criteria	Used numeric values, where: Very Poor = 0.0-0.4, Poor = 0.5-0.9, Fair = 1.0-1.4, Fair/Good = 1.5-1.9, Good = 2.0-2.4, Very good = 2.5-3.0.
Canelas et al. (2005)	Assessed and compared the quality of EIS of different sectors between Portugal and Spain	Used alphabetic symbols, where A = Excellent, B = Good, C = satisfactory, D = Poor, E = Very poor
Cashmore, Christophilopoulos & Cobb (2002)	Assessed quality of EIS of different sectors in Greece.	Used alphabetic symbols, where A= Well performed, B = Generally satisfactory, C = Satisfactory, D = Just unsatisfactory, E = Not satisfactory, F = Very unsatisfactory
Barker & Wood (1999)	Assessed and compared the quality of EIS of different sectors in eight EU countries	Used alphabetic symbols, where A = Well performed, B = Generally satisfactory, C = Satisfactory, D = Just unsatisfactory, E = Not satisfactory, F = Very unsatisfactory
Hickie & Wade (1998)	Used 19 review questions to review the quality of 14 EIS of different sectors in United Kingdom	Used numerical weakness index, where 6 = Very poor, 5 = Poor, 4 = Unsatisfactory, 3 = Satisfactory, 2 = Good, 1= Excellent
Lee & Colley (1992)	Used review criteria developed in the context of United Kingdom	Used alphabetic symbols, where A = Well performed, B = Generally satisfactory, C = Satisfactory, D = Just unsatisfactory, E = Not satisfactory, F = Very unsatisfactory

However, according to Lee (2000b), the quality of EISs has to be assessed taking into account the regulatory and procedural context in which they are prepared (Lee 2000b, p.138). Lee and Colley (1992) developed review criteria in the context of the United Kingdom (UK). Therefore, studies held elsewhere (other than the UK context) have taken this concern into account. For example, Sandham and Pretorius (2008), and Badr, Cashmore and Cobb (2011) adapted the review criteria such that they would be suitable to the South African and Egyptian context respectively. With this in mind, some criteria (* marked) were added to the Lee and Colley (1992) review criteria to make the review package suitable to the context of Bangladesh (Box 3.3).

Box 3.3: Criteria for the review of EIS quality in the context of Bangladesh

<p>1. Description of the development and baseline</p> <p>1.1 <i>Description of development</i></p> <p>1.1.1 Background and objectives of project</p> <p>1.1.2 Design and size of the project</p> <p>1.1.3 Some indication of physical presences</p> <p>1.1.4 Nature of production process</p> <p>1.1.5 Nature and quantities of raw materials</p> <p>1.1.6* Policy and legal framework for EIA</p> <p>1.1.7* EIA aim and objectives</p> <p>1.1.8* Limitation of study</p> <p>1.2 <i>Description of site</i></p> <p>1.2.1 Land area taken by the development site</p> <p>1.2.2 The use of land taken</p> <p>1.2.3 Estimated duration of project alternatives</p> <p>1.2.4 Number of workers and means of transport</p> <p>1.2.5 Means of transporting raw materials</p> <p>1.3 <i>Waste generation</i></p> <p>1.3.1 Types and quantities</p> <p>1.3.2 Production process and waste generation</p> <p>1.3.3 Treatment of wastes generated</p> <p>1.4 <i>Environmental description</i></p> <p>1.4.1 Environment expected to be affected</p> <p>1.4.2 Offsite impacts</p> <p>1.5 <i>Environmental baseline</i></p> <p>1.5.1 Description of important components</p> <p>1.5.2* Natural physical environment</p> <p>1.5.3* Biological environment</p> <p>1.5.4* Socio-economic environment</p> <p>1.5.5 Methods and sources of data with justification</p> <p>1.5.6 Future state of environment without project</p> <p>2. Identification and evaluation of key impacts</p> <p>2.1 <i>Definition of impacts</i></p> <p>2.1.1 Impact types</p> <p>2.1.2 Impacts with regard to human, ecology etc</p> <p>2.1.3 Impacts of accidents</p> <p>2.1.4 Impacts as the deviation of baseline</p> <p>2.2 <i>Identification of impacts</i></p> <p>2.2.1 Methods used for impacts</p> <p>2.2.2 Justification of methods used</p> <p>2.3 <i>Scoping</i></p> <p>2.3.1 Arrangements for scoping</p> <p>2.3.2 Methods of collection of opinions</p> <p>2.3.3 Inputs from stakeholders</p> <p>2.3.4 Selection of key impacts to be investigated</p>	<p>2.4 <i>Prediction of impacts</i></p> <p>2.4.1 Data gaps and uncertainty</p> <p>2.4.2 Methods used with justification</p> <p>2.4.3 Quantitative expression where possible</p> <p>2.4.4* Uncertainty</p> <p>2.5 <i>Assessment of impact significance</i></p> <p>2.5.1 Significance of impact on community and environment</p> <p>2.5.2 Methods used for evaluation of impacts</p> <p>2.5.3 Justification of methods used</p> <p>2.6 <i>*Community involvement</i></p> <p>2.6.1 Description of community affected</p> <p>2.6.2 Involvement of community</p> <p>2.6.3 Methods of community involvement</p> <p>2.6.4 Inputs from community</p> <p>3. Alternatives and environmental mitigation</p> <p>3.1 <i>Alternatives</i></p> <p>3.1.1 Alternative sites</p> <p>3.1.2 Alternative process, design and activities</p> <p>3.1.3 Selection of alternatives</p> <p>3.2 <i>Scope and effectiveness of mitigation measures</i></p> <p>3.2.1 Description of adverse impacts to be mitigated</p> <p>3.2.2 Mitigation measures with justification</p> <p>3.2.3 Residual impacts</p> <p>3.3 <i>Commitment to mitigation</i></p> <p>3.3.1 Implementation arrangements</p> <p>3.3.2 Monitoring program</p> <p>3.3.3* Parameters to be monitored</p> <p>3.3.4* Feedback and reporting mechanism</p> <p>4. Presentation of EIS and communication</p> <p>4.1 <i>Layout</i></p> <p>4.1.1 Introduction and brief description</p> <p>4.1.2 Logical arrangements of information</p> <p>4.1.3 List of references</p> <p>4.2 <i>Presentation</i></p> <p>4.2.1 Comprehensible to non-specialist</p> <p>4.2.2 Defining technical terms</p> <p>4.2.3 Presented as an integrated whole</p> <p>4.3 <i>Emphasis</i></p> <p>4.3.1 Potentially severe adverse impacts</p> <p>4.3.2 Unbiased statements</p> <p>4.4 <i>Executive summary</i></p> <p>4.4.1 Findings presented in a non-technical way</p> <p>4.4.2 Recommendations</p>
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Source: Modified after Lee & Colley 1992

3.4.3.1 Description of review criteria

Box 3.2 shows that the criteria are divided into three categories, namely area, category and sub-category. At the top, there are four areas according to Lee and Colley (1992):

Area-1: The description of development and baseline conditions,

Area-2: Identification and evaluation of key impacts,

Area-3: Environmental management plan and follow-up, and

Area-4: Presentation of EIS.

Under each area there are categories (for example, 1.1, 1.2 ...2.1, 2.2) and under each of the category there are subcategories (for example 1.1.1, 1.1.2,.....2.1.1, 2.1.2). All the areas, categories and sub-categories are referred to as tasks.

3.4.3.2 Selection of EISs: A total of 30 EISs of different projects (Appendix-F) were selected irrespective of different development sectors and the year of the EIS preparation. This study covers the EISs prepared between 1995 and 2008. There have been 20 full EIAs for major projects conducted in Bangladesh on average per year (DOE 2009). With this in mind, it can be estimated that, after the initiation of formal EIAs in 1995, the total number of EISs subjected to full EIAs is about 280. Therefore, the sampled 30 EISs for this study is representative of the EISs prepared in Bangladesh and allow a general understanding of the quality of EISs in Bangladesh. A list of the EISs, along with respective sectors, is given here (Table 3.3).

Table 3.3: Number of EIS by sector

Sl.No	Name of Sectors	Number of EISs	Major characteristics
1	Water Resource Management	9	All are public projects excepting two that are funded by donor agencies. Two are funded by government only.
2	Industry	5	Three projects are private projects and two projects are donor funded public projects
3	Energy, Power and Mineral Resources	11	All projects are public funded projects and private (owned by multinational companies) projects
4	Infrastructure (roads, bridges and urban projects)	5	All projects are public projects and funded by donor agencies

3.4.3.3 Assessment procedures

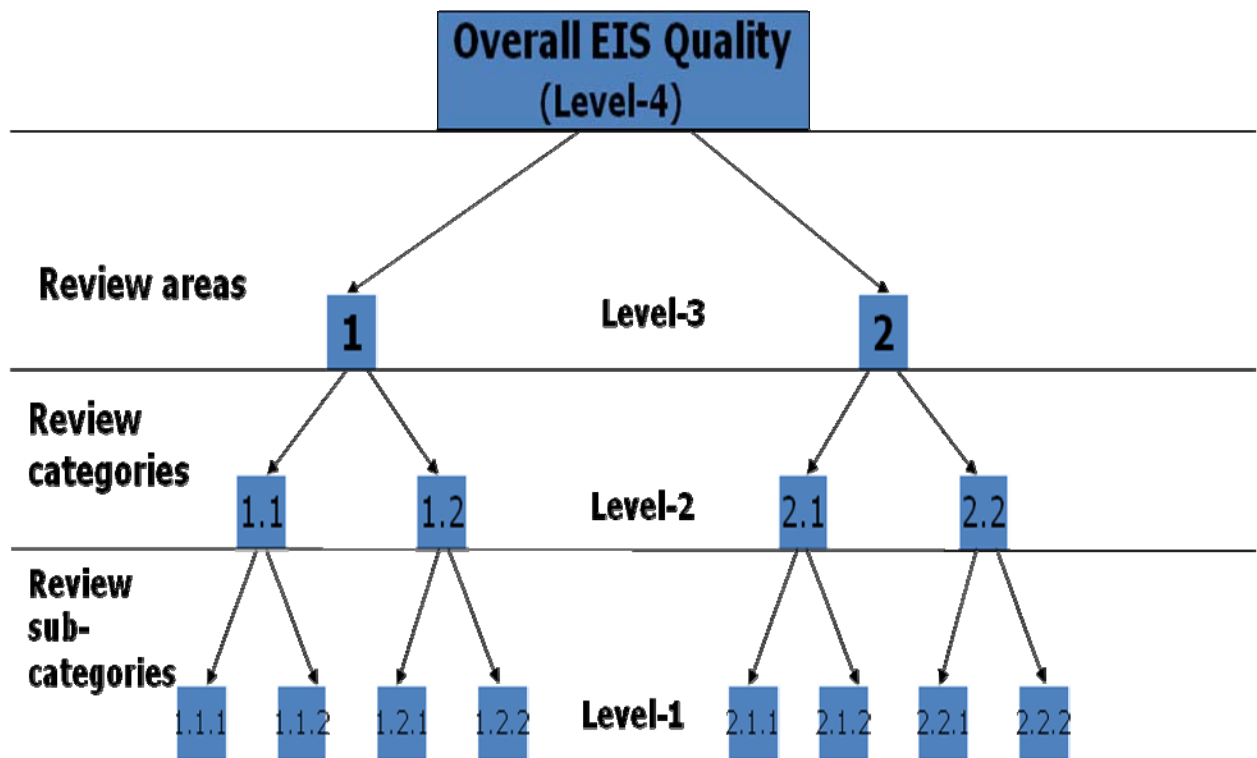
Figure 3.3 shows a schematic view of the assessment procedure starting with the sub-criteria and finishing with the overall assessment of EISs. Each sub-criterion was graded on the basis of the adequacy and quality of the materials provided. The judgement of the adequacy of information in each criterion and subsequent gradation was done based on the following issues:

- What information must contain;
- What information could contain; and
- What information could reasonably be expected to contain (Weston 2000b).

The review commenced at the lowest level (Figure 3.3), that is, the sub-criteria level (Level-1). Each sub-criterion was awarded an alphabetic symbol as a grade according to the quality of information presented under that sub-criterion. An average grade was then

calculated for each respective category at Level-2. In this way the average grade was calculated for each area at Level-3. Finally, from the grades given to each area, it was possible to arrive at an overall average grade of the EIS (Level-4).

Figure 3.3: Schematic view of assessment procedure from sub-category to the overall assessment of quality



Source: Modified after Lee et al. 1999

Alphabetic symbols were used to grade the sub-criteria, criteria and areas. Table 3.4 shows how the alphabetic symbols correspond with the grades. There are six alphabet symbols (A, B, C, D, E and F) used to grade the criteria. Where a sub-criterion or a criterion was not relevant, 'NA' was placed in the record. Attributing grades for each criterion forces the reviewers to identify and clarify, overall, what information is

missing and what is the quality of existing information in terms of its clarity, organisation and presentation. Finally, using such a review process, the reviewers can justify any deficiency with confidence and put requests for further information into practice.

Table 3.4: Alphabetic symbols and the definition of grades

Alphabetic symbols	Grades	Basis of grading: what does it mean
A	Excellent	Well performed. Tasks are fully completed, all relevant information provided accurately and adequately where necessary.
B	Good	Generally satisfactory. A completed EIS with only minor omissions and inadequacies.
C	Just satisfactory	Parts of the EIS are well attempted, but, on the whole, satisfactory only because of some major omissions and the limited coverage of information.
D	Poor/just unsatisfactory	Revealing significant omissions and inadequacies. Very limited coverage.
E	Very poor/unsatisfactory	Revealing significant omissions and inadequacies. Important tasks are poorly attempted.
F	Fail/very unsatisfactory	Not attempted at all.
N/A	---	Not relevant or not applicable.

A collation sheet (Appendix-G) was used to record the grades against each sub-criteria and criteria and subsequent area of an EIS. Moreover, the principal strengths and weaknesses of the EISs were recorded in brief. Furthermore, the length the EISs (number of pages), the size of EIA team, the sources of funding (government, private or donors) and types of proponents (government or private) were recorded while reviewing the EISs.

Weston (2000b) states that the attributing of an individual grade-point (be it numeric or non-numeric) to an individual criteria is inherently subjective. In order to overcome this limitation, Lee et al. (1999) suggest that each EIS should be reviewed by two reviewers. In this study the EISs were reviewed independently by the researcher and one EIA expert. Both reviewers were quite familiar with knowledge and skills concerning EIA issues. Where any difference was found in symbols for a criterion, then that criterion was carefully reviewed for the third time. The final result was then accepted, balancing the findings obtained from two reviewers. Appendix-H shows the summary results of the 30 EISs reviewed. The detailed results of the quality of the EISs are described in Chapter 5, after analysis.

3.4.4 Site visits and direct observations

Observation can be used as a supplementary or supportive technique to collect data that may complement the data obtained by other means (Kearns 2000, p.105; Robson 1993, p.192). It helps in identifying important information that goes beyond the thoughts of the researcher's or the relevant documents (Patton 2002, p. 306). Furthermore, observation provides a firsthand experience within a setting. It also allows the researcher to become open and discovery oriented, because by being on-site the researcher had the opportunity to see what had actually happened at the spot. Since this research has used other methods (for example, interview and document analysis) in the collection of data, site visits and direct observation were suitably supportive techniques for collecting valuable supplementary data.

In this study, three projects from three different sectors (water, power and infrastructure sectors) were selected to determine the status of the implementation of mitigation measures. These projects sites were visited by the author for the purpose of collecting information via direct observation. Observation also offered a check on what key informants said about the implementation of mitigation measures (Patton 2002).

The researcher in this study observed physical evidence, that is, activities oriented to the implementation of mitigation measures and the management of environmental impacts, at all three projects. The researcher also observed the role of the community in the implementation of mitigation measures and the scope of monitoring. This direct verification enabled the researcher to understand the issues and problems relating to the implementation of mitigation measures and the management of the environmental impacts of the projects.

Figure 3.4 shows the locations of the projects in Bangladesh. The three projects are: Kulna-Jessore Drainage Rehabilitations Project (KJDRP), Meghnaghat Power Plant Project, and Jamuna Multipurpose Bridge Project (details described in Chapter 6). The three projects had already been implemented and were, therefore, ideal for investigating the implementation of mitigation measures.

Figure 3.4: Projects investigated and their locations in Bangladesh



Source: Government of Bangladesh 2005

As observation is not restricted only to what we see (Ruane 2005, p.174), informal discussions were also held with key informants of the projects. The key informants were members of the local community affected by the project, project proponents, officials and consultants involved in the implementation of mitigation measures. The list of key informants is attached (Appendix-I). In this study the observation method was also used during discussions with the stakeholders about the implementation of mitigation measures during the three projects. During the discussion, the observation method was also used to note the verbal and nonverbal signals and the matters that interviewees were not willing to discuss (Angrosino & dePerez 2000, p.673, Patton 1992). Observational data was useful for interpreting the information delivered verbally by the informants (Begley 1996, p. 691). Based on observation and discussion ‘a summary

information sheet' (Appendix-J) was also filled so as to understand the status of the mitigation measures implemented for each of the projects.

Photos were also taken during site visits that related to the implementation of mitigation measures. Photographs were taken for each of the three project sites and helped in recalling the things that occurred, as well as vividly capturing the settings (Patton 2002, p. 308). The photographs helped to illustrate the observation process of the status of the mitigation measures that had been implemented. In addition, the photos showed the context in which the information was collected. Thus, the research activity that was conducted was made richer through the inclusion of multimedia products, such as photographs and audio and video footage (Denzin & Lincoln 2003, Flick 2009, Hunsberger, Gibson & Winner 2005).

3.5 Analysis of data

In this study, data was analysed whilst keeping in mind the research questions described in Chapter 2. The following functions were undertaken during the analysis of the data:

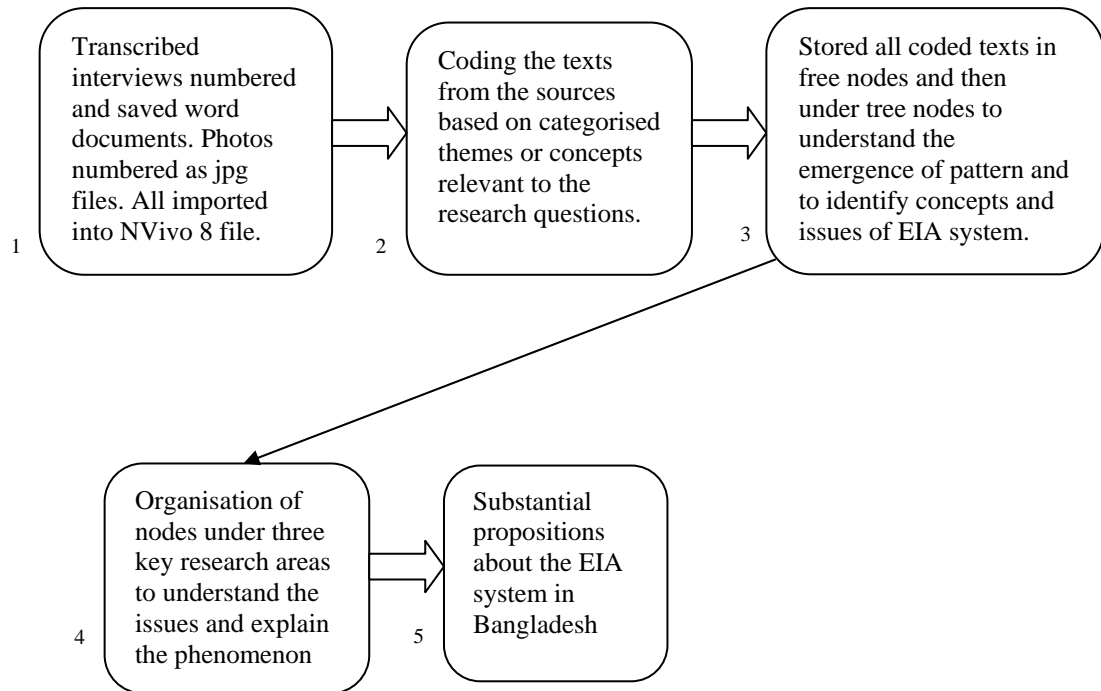
- Conceptualization and understanding of the nature of the EIA system in Bangladesh,
- Mapping the EIA practice in Bangladesh and its success compared with international good practice,
- Categorization of different issues (what are the problems),
- Finding associations between issues and themes,
- Developing new ideas and insights about the EIA system in Bangladesh.

3.5.1 Application of NVivo8

The recorded interview data was transcribed into textual form and then analysed, along with the other data collected throughout the site visits and observation, using NVivo 8 software. According to Bazeley (2007), NVivo is popular software that is used in qualitative research to systematically handle data. The NVivo package is relatively new and simple to use (Welsh 2002). Wickham and Woods (2005) state that the use of NVivo makes the research and analysis process more logical and transparent. NVivo8 allows coding and categorising of narrative text such as interviews and filed notes. Systematic analysis and logical arrangement of analysed data provides a pattern to the development and understanding of themes and issues within the research.

Data process and analysis by NVivo: All of the transcribed documents were stored in the form of rich text files in the NVivo8 program. Coding the data consumed the major portion of the analysis time. However, once the documents containing data was coded, other features of NVivo made it simple to organise and understand the emerging results. The materials were analysed as a whole to produce a general picture and to answer the research questions. Figure 3.5 shows the process of analysing data using NVivo8.

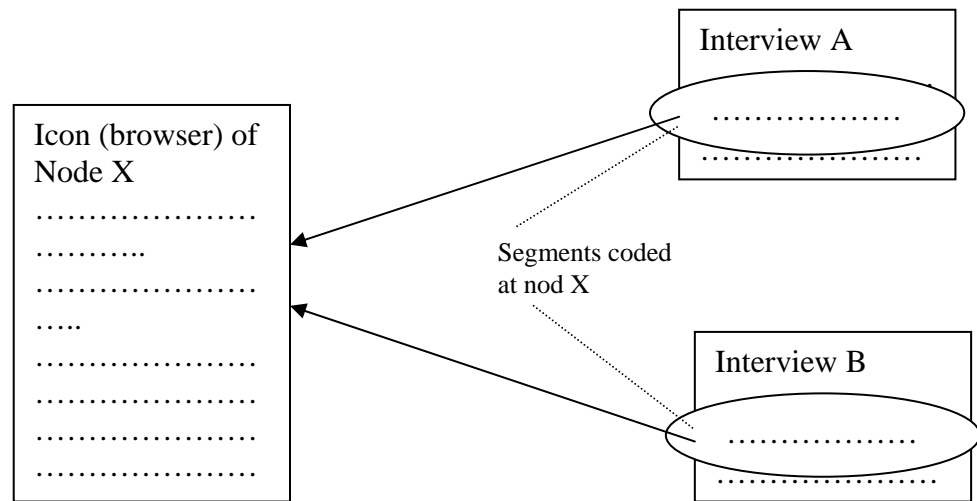
Figure 3.5: The process of analysis of interview data using Nvivo.8



Source: Developed by the researcher

The relevant segments of the text were highlighted and a code was attached to that portion of file. Thus, the software found and collected the segments of all of the texts that matched each of the codes (Figure 3.6). All coded data was stored first under free nodes and then under tree nodes. Once all of the segments of the interview texts were coded, it was possible to retrieve all similarly coded sections. This allowed the researcher to grasp the varying opinions given by interviewees on a certain issue and to begin to describe the findings of the research.

Figure 3.6: Coding of text data using Nvivo



Source: Modified after Bourdon 2002

Referencing data from interview and discussions: In order to allow the 25 interviewees to appear as anonymous references in the text of this thesis, an ID number was assigned to each of them, for example, 'Interview#1' or 'Interview#2' when the interview data was organised. Also, persons interviewed in the case of three projects (listed in Appendix-I) to provide understanding of the status of implemented mitigation measures were referred in the text of this thesis using a different set of ID numbers. To assign an ID number, the initial name of the key informant and the initials of the respective project name were used so as to make it distinct from the above mentioned IDs such as Interview#1 or Interview#2. For example, 'KJDRP-Mujibul' indicates that Mujibul is a key informant of the Khulna-Jessore Drainage Rehabilitation Project (KJDRP).

3.5.2 Spreadsheet analysis

Spreadsheet analysis (Excel) was used to analyse quantitative data collected thorough the review package in order to assess the quality of EISs. The raw data was stored in a spread sheet and organized for each EIA report. The data was then summarised to gain an understanding of the quality of EISs by areas and the overall quality of sampled EISs. Simple statistical analysis was performed using Excel to present the data in graphic form.

It must be noted that all of the activities relating to the process of data collection using selected methods, analysis of collected data, and that the presentation of findings have undergone a quality control process. The next section describes how the quality of this research was controlled.

3.6 Quality control of this research

3.6.1 Quality criteria for a qualitative research

Several authors such as Lincoln and Guba (1985), Marshall and Rossman (1995, p.143) and Baxter and Eyles (1997) identified processes and criteria that are broadly common in controlling the quality of research. They suggest that the criteria of credibility, transferability, dependability and conformability are useful general principles for guiding an evaluation of the rigour (trustworthiness) of a piece of qualitative research. Baxter and Eyles (1997) argue that these criteria can be seen as being roughly equivalent to the concepts of internal validity, external validity, objectivity, and reliability and these have been widely used to evaluate the quality of quantitative

research (Baxter & Eyles 1997). In this qualitative research the four principles/criteria that were used include credibility (resembles internal validity), transferability (corresponds to external validity), dependability (similar to reliability), and conformability (resembles objectivity). Table 3.5 shows how these criteria were addressed in this study for quality assurance.

Table 3.5: Quality control of research using quality criteria

Criteria	Definitions	How these criteria were met
1.Credibility (internal validity)	Establishing that the results of research are credible/believable/truthful from the perspective of the readers and stakeholders.	<p>1. First the researcher had to undergo a rigorous ethical process before going into the field for collection of data. Interview questions and other data collection tools were checked by the University Ethics Committee. Some questions were modified in response to the queries by the Committee. The process of contacting interviewees, style of probing, rights of interviewees was approved by the Committee.</p> <p>2. For the interview method, Information Statements were sent to potential interviewees so that they could understand the aims of the research. Only the interviewees who had knowledge and experience with EIA practice were interviewed. The interview schedule was pretested to refine the questions for appropriate data.</p> <p>Therefore, the answers of questions were expected to be quite relevant to the EIA practice. What they have said is usually authentic as they have said it from their own experiences.</p> <p>2. Each interview was conducted by the researcher. Visiting project sites, direct observation and discussion with project stakeholders were also performed by the researcher himself. Follow-up data was collected.</p> <p>The interviews were conducted by the researcher and hence, the bias or weaknesses in the data that might arise from using interviewers other than the researcher were minimised. Similarly, the process of visiting project sites and direct observations by the researcher himself minimized the potential bias and maximised the authenticity of the data.</p>
2.Transferability (external validity)	The degree to which the results of the research can be generalized or transformed to other settings	<p>1. The conceptual framework that was developed was based on different approaches that might be applicable in other countries for analysing EIA systems.</p> <p>2. The interview method and all other methods in this study used to obtain information are consistent across different settings and scales and these methods are widely used and already well established. Finally, although the content will not be transferable, the experience and lessons from the research experience will and can be transferable.</p>

Table-3.5 (continued)

3.Conformability (objectivity)	The degree to which results could be confirmed or corroborated by others or other sources	<ol style="list-style-type: none"> 1. Achieved through similar previous research findings from other developing countries and, to some extent, from Bangladesh. 2. Achieved through presentation of research findings at various international conferences and publishing as quality journal papers. Findings have undergone scrutiny when reviewed for journals and conference proceedings 3. Data was checked by interviewees as to confirmation of what was said. Follow-up data was collected to confirm interview results and to address data gaps.
4.Dependability (reliability)of data and findings	The degree to which data and research findings are reliable or dependable in terms of methodological rigour and analysis of data	<ol style="list-style-type: none"> 1. Achieved through triangulation (to be elaborated on in the next section) particularly adopting various approaches in methodology. 2. In some cases, respondents were asked to corroborate findings (member check). The local language was used when in discussion with member of the community at the project sites. Therefore, they could understand the context of the questions and were spontaneous in providing answers that contained reliable information. 3. Respondents were experienced and knowledgeable on EIA as they have been and are involved in EIA practice.

Sources: Lincoln & Guba 1985, Patton 1992, Phillips 1990

3.6.2 Triangulation (to maximise the reliability of research findings)

According to Patton (1999) triangulation means ascertaining whether the findings of a study are consistent, that is, the data yields a similar result. The consistency and accuracy of research findings can be confirmed by a single researcher using multiple methods or by a number of researchers using a single method. In this study, it was not technically possible to collect data and develop findings by many researchers using one method as this study was conducted by a single researcher (the PhD candidate).

However, this research used a number of methods for generating data that would ensure the utmost reliability of the data and findings. Jick (1979) argues that the use of

multiple (and thereby complementary) methods is generally thought to lead to the attainment of more valid results. The model for triangulation strategies is currently more popular and appropriate (Jick 1979, p.603). The use of multiple methods for this research project paved the way for more credible and dependable information since each single method had its own limits for collecting information for the whole phenomenon (Decrop 1999). This study applied interview, observation, document analysis, case study and review criteria for data collection. These methods were used to complement the information and, thereby, to enhance the density of the information. Therefore, the information gathered from various methods completely and appropriately helped in addressing the key research questions.

Importantly, the information that was attained by means of using different methods has been used to corroborate, elaborate or illuminate the research findings. The application of the multi-method approach has not only limited the appearance of personal and methodological biases, but also enhanced the generalization of the study. The use of the multiple methods in the process of triangulation has opened the way for richer and potentially more valid interpretation. This is because, the inherent weaknesses and biases of each specific method would, if carefully thought out, be compensated for to some extent by the strengths of the other methods (Begley 1996, p.689). Thus, multiple research methods have increased the information obtained from particular perspectives and, thereby, provide a more holistic view (Begley 1996, p.688) of the effectiveness of EIAs in Bangladesh. In sum, multiple methods in this study contributed to the generation of holistic work and thick description (Jick 1979, p.609).

Data was collected using site visits, direct observations, and discussions with stakeholders to determine the performance of EIAs at the post-EIS stage. These three methods were used to collect information and were also complementary to each other. Data from interviews helped to identify the success or failure of the implementation of mitigation measures. Site visits and observations then contributed to verifying the actual status of the implementation of the mitigation measures. Thus, the use of multiple methods led to the emergence of a more complete picture of the phenomenon.

3.7 Some operational difficulties faced by the researcher during fieldwork

In Bangladesh, market based EIA consulting firms and full time EIA practitioners have not emerged and grown as in developed countries, such as the United Kingdom, USA or Australia. There is also no list or database of EIA practitioners and consulting firms preserved by the Department of Environment (DOE) or elsewhere in Bangladesh. Therefore during the field work, although the researcher found adequate sources of information (individual interviewees and organisations), it was a time-consuming and difficult task.

The researcher himself interviewed all the participants in this study without engaging any other interviewers in order to ensure the quality of the data. However, communicating and interviewing all of the participants in a face-to-face setting by the researcher alone was a time-consuming and challenging task. The traffic jam (congestion) situation in Dhaka city is well known. It was also difficult to travel to other parts of Bangladesh in a timely and comfortable fashion. In spite of all these problems, the researcher interviewed all of the targeted participants successfully.

The absence of systematically recorded data by the proponent office or other implementing agencies responsible for the implementation of mitigation measures hindered the study from processing. The researchers, however, overcame this difficulty by using various methods such as interviews with project stakeholders, project site visits and direct observation.

This research would have benefited from additional information from officials and others who were directly involved in the implementation and management of mitigation measures to determine the extent of the mitigation measures implemented. It was not possible to find all officials, because the projects were implemented before 2004 and many of those involved left after the implementation of the projects. The researcher recognises that information from all of these officials could be useful to supplement observational data and crosscheck interview data collected from the affected community.

3.8 Chapter summary

This chapter described the methods used to review the EIA system in Bangladesh. In this study, a number of methods were applied to collect data. These methods were interviews, document analysis, a review package, site visits and direct observation. The process of data collection using these methods was also described. The analysis of data was performed using Nvivo8 and spreadsheet analysis. Furthermore, strategies to control the quality of this research were discussed. The next three chapters (Chapters 4, 5 and 6) present the findings based on the analysis of collected data.

Chapter-4

Institutional framework for the EIA system in Bangladesh

4.1 Introduction

An effective EIA system depends on legal (laws, rules, regulations and traditions) and administrative arrangements (EIA procedure, administrative structure, roles and responsibilities of agencies, resources and capacity). In fact, the strength of the legal mandate of EIA institutions is a measure of the level of a country's commitment to an effective EIA system (Lohani et al. 1997). Institutional arrangement is one of the fundamental determinants of effective EIAs (Sadler 1996, p.78, Lee 2000a, p31). It is necessary to scan the current legislative arrangements since inadequate and ambiguous legislation cause substantial costs and uncertainty in the application of EIA and cause delays in achieving objectives.

In order to be effective, an EIA system needs to be supported by adequate administrative arrangements. Therefore, it is essential to evaluate the responsibilities, roles and structures of the formal and supportive institutions involved in the EIA process and their capacities to manage EIA practice. Such an evaluation helps to identify the gaps and strengths of existing institutional arrangements and, thereby, helps in the selection and development of appropriate mechanisms. Furthermore evaluation assists in the identification of responsible authorities at various levels of governance. An institutional review of EIA also helps in making recommendations to streamline and

consolidate roles, responsibilities and structures of existing institutions to promote an effective EIA system.

This chapter presents the findings on the existing institutional arrangements of the EIA system in Bangladesh. The findings presented in this chapter answer the question:

Question-1: To what extent are the institutional arrangements of EIA system adequate in Bangladesh?

In this chapter, Section 4.2.1 features the legal framework for EIAs in Bangladesh that covers constitutional policy, acts, rules and other legal documents. Section 4.2.2 outlines the administrative framework, including stakeholders involved in EIA practice. Section 4.3 provides a brief description of the stages of the EIA process in Bangladesh. Finally, Section 4.4 presents the strengths and weaknesses of the institutional arrangements of the EIA system in Bangladesh. This is followed by a chapter summary.

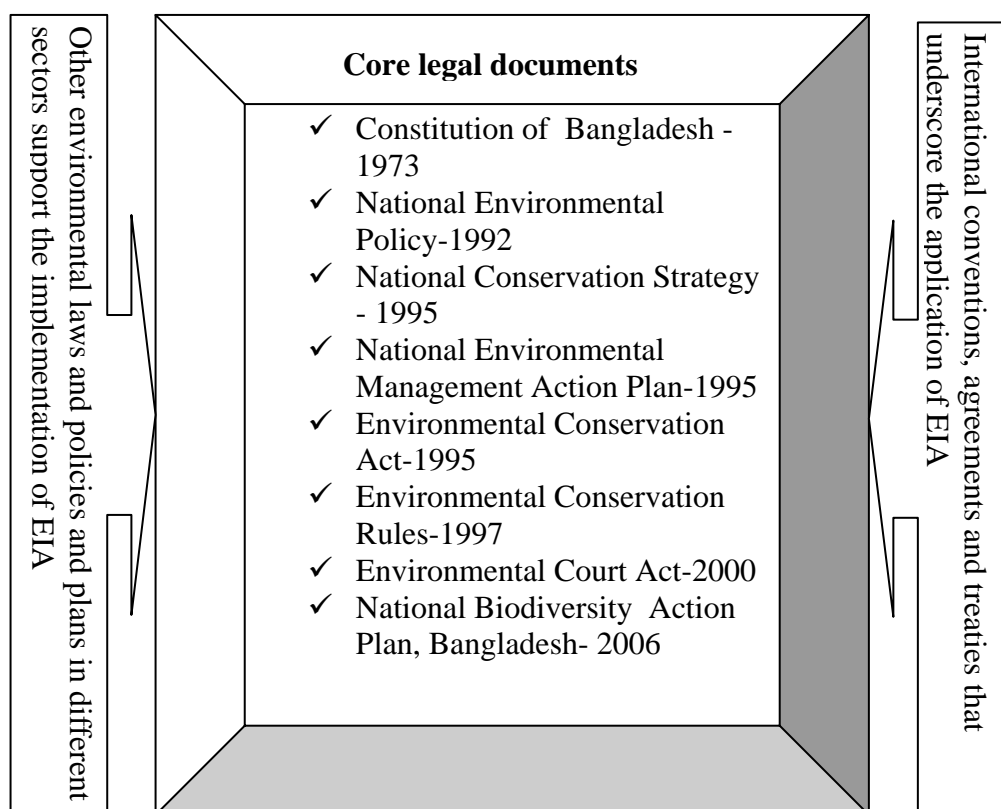
Methodology: The methods used to investigate the effectiveness of institutional arrangements included interviews with key stakeholders and analysis of policy documents relevant to EIA. These methods and processes of data collection were discussed in detail in Chapter 3. The inventory of the institutional arrangements for the EIA process in Bangladesh and the overview of the current situation is the result of the analysis of official documents of the Bangladesh government and interview data.

4.2. Legal and institutional arrangements for the EIA system

4.2.1 Legal arrangements

Legal arrangements for the EIA system in Bangladesh broadly include constitutional rights, national environmental policy, plan, strategy, and, more importantly, the Environmental Conservation Act and Environmental Conservation Rules (Figure 4.1). These are described below.

Figure 4.1: Legal arrangements of EIA system in Bangladesh



Source: Department of Environment 2009

The constitution of Bangladesh: The constitution of Bangladesh protects the ‘the right to life and personal liberty’ (Articles 31 and 32) as a fundamental ‘right to life’ (GOB 1973, p43). Although the constitution does not explicitly recognise that the rights to the environment should be a fundamental right, the Supreme Court of Bangladesh has resolved that the ‘right to life’ is enshrined as a fundamental right and encompasses the ‘right to a healthy environment’ (Gain 1998, p.1). This was the outcome of two litigations³ submitted by the Bangladesh Environmental Lawyers’ Association (BELA) against proponents to protect the environment from the impacts of development projects (Hoque 2006). Thus, the right to environmental protection is based on these historic judgements and is now constitutionally supported in Bangladesh. It is, therefore, a constitutional obligation for all actors involved in development activities to apply EIAs in order to protect the natural and social environments of Bangladesh.

National Environmental Policy: Before attending the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, the Government of

³ The first case is known as Dr Mohiuddin Farooque, Secretary General of Bangladesh Environmental Lawyers Association (BELA) versus Bangladesh, presented by the Secretary, Ministry of Irrigation, Water Resources and Flood Control and Others. BELA filed a petition in the High Court against the implementation of a flood control project under the Flood Action Plan (FAP-20) in 1996. The petition was dismissed by the High Court on the ground that BELA was not an aggrieved person within the meaning of Article 102 of the Constitution of Bangladesh. BELA then filed an appeal before the Appellate Division.

In response to the appeal filed by BELA in the Appellate Division, the Appellate Division of the Supreme Court of Bangladesh allowed the appeal stating that the expression ‘any persons aggrieved’ is not confined to individually affected persons only, but extends to the people in general, as a collective and consolidated personality. So BELA has the right to submit the writ petition according to Article 102 in respect of a subject matter of great public concern. The Appellate Division also states that although Bangladesh does not have any provision such as Article 48A of the Indian Constitution for Protection of the Environment, Articles 31 and 32 of the Constitution of Bangladesh protect the right to life as a fundamental right. It encompasses within its ambit, the protection and preservation of the environment, an ecological balance free from polluted air, and water, without which life can hardly be enjoyed. Any act or omission contrary to that will be a violation of the said right of law (ESCAP 2001).

Bangladesh had approved a cross-sectoral policy, the National Environmental Policy (NEP) in 1992 (MoEF 1992). The NEP reiterates the broad based approach to environment and development that was embodied in the Rio Declaration. The NEP was predicated on a growing concern for the degradation of the natural resource base in Bangladesh and the potential consequences of this degradation. It also takes into account the ways in which the natural resource base is affected by the development activities of different sectors.

The overall policy goal of NEP is to improve the health and quality of life of the people of Bangladesh through optimal use of natural resources and sound management of environment as a whole. The extracts (Box 4.1) derived from policy objectives and policy elements within NEP can be considered as essential guidance and support for the promotion of sustainable development in general and the application of EIAs in particular.

Box 4.1 Key extracts of the National Environmental Policy 1992

- Maintenance of the ecological balance and overall progress and development of the country through protection and improvement of the environment;
- Protection of the country against natural disasters such as cyclones, floods and earth quakes;
- Identification and regulation of all types of activities which pollute and degrade the environment;
- Ensuring proper Environment Impact Assessment (EIA) prior to undertaking of industrial and other development projects;
- Ensuring sustainable use of all natural resources; and
- The establishment of necessary institutional framework and determine the linkage of its parts for undertaking, coordinating and approving EIAs and subsequent system of monitoring and auditing.

Source: Ministry of Environment and Forest 1992

An important objective of the NEP is to ensure environmental friendly development projects in all relevant sectors (MoEF 1992, p. 324). Indeed, the policy objective calls for EIAs to be carried out as an environmental management tool to identify the potential impacts of projects on the environment before approval (MoEF 1992, p.327). The NEP is providing key policy objectives and guiding principles. These principles are very important as they have shaped the EIA system formulation and later implementation of the mechanism.

National Environmental Management Action Plan (NEMAP): The National Environmental Management Action Plan of 1995 was formulated with the objective of identifying environmental concerns in various sectors and the consequent actions to

address the environmental concerns (MoEF 1995a, p.12). The NEMAP is considered to be the basis for concretizing programs and interventions aimed at promoting better management of scarce resources and reversing the trend of environmental degradation (MoEF 1995a, p.14). The NEMAP works through all of the concerned sectors and identifies the areas of actions needed to promote sustainable development in Bangladesh. The NEMAP has, therefore, underscored the importance of EIA application.

The National Conservation Strategy (NCS): The NCS was prepared in 1995 (MoEF 1995b) in response to the Global Conservation Strategy prepared by the International Union of Conservation of Nature (IUCN) in the early 1990s. It was an important step for Bangladesh towards achieving its objectives and integrating the necessary environmental policies. By adopting NCS, the government not only reinforced its national and international commitments towards sustainable development, but also gave a commitment to the effective application of EIAs (MoEF 1995b).

National Biodiversity Action Plan: In 2006, the GOB prepared the National Biodiversity Action Plan for Bangladesh (NBAPB) in response to the International Convention of Biological Diversity (ICBD). The major objective of this document is to conserve and restore the biodiversity of the country for the wellbeing of the current and future generations. This national document embodies Bangladesh's strategic approach towards conserving the nation's biological diversity. One of the key strategies for conserving the biodiversity is the use of EIAs to integrate the biological issues (MoEF 2006, p.24).

Environmental Conservation Act: Based on the commitment made in the National Environmental Policy (1992), the first major law that was promulgated for the specific purpose of protection of the environment and conservation of the nature is the Environmental Conservation Act (ECA) of 1995. This was followed by the Environmental Conservation Rules (ECR) of 1997. The ECA codifies the country's obligation to protect the environment and ensures sustainable use of natural resources. The ECA provides the legal basis for EIAs in Bangladesh. It also calls for the assessment of the environmental impact of new development projects. Section 12 of the ECA stipulates that 'no industrial unit or project shall be established or undertaken without obtaining an Environmental Clearance from the DOE in the manner prescribed by the rules' (DOE 1995, p.3).

Section 15(8) of the ECA declares punitive action against the violation of section 12. The Act also stipulates the actions for the enforcement of EIAs at the post-EIS stage of EIA process. There are punitive measures specified by the ECA if a project damages ecosystem or pollutes the environment during its implementation or operation. The DOE can take administrative action including the determination of compensation; the DOE can even file a compensation case or criminal case in the environmental court against the polluters (Section 7). Furthermore, Section 20(f) of the ECA states that, in order to carry out the purposes of the ECA, procedural rules for EIAs, irrespective of sectoral projects, shall be made.

Environmental Conservation Rules: The Environmental Conservation Rules (ECR) of 1997 has been promulgated for the operation of EIAs. The ECR thus establishes greater and more detailed requirements of EIA study and implementation procedures. The ECR prescribes the EIA requirements with particular focus on the process of Environmental Clearance. According to ECR 1997, all private and public funded projects subject to EIAs have to be submitted with EIA reports being made to the DOE for environmental clearance.

The ECR also stipulates the authority and responsibility of the DOE to implement the EIA in an effective way. Section 13 of the ECR states the formulation of environmental guidelines, including EIA guidelines, for the ‘control and mitigation of environmental conservation and to improve the environment’. Sections 7 to 14 of the ECR lay out procedural requirements including the application process for environmental clearance, the approval process and issuance of environmental clearance, the roles and responsibility of the DOE, the validity of the Environmental Clearance Certificate (ECC), the procedure of appeals, and the hearing about the rejection of EIA reports by the DOE (DOE 1997a, pp.183-188). Box 4.2 represents the major features of the ECA and ECR.

Box 4.2: Major features of the Environmental Conservation Act (1995) and the Environmental Conservation Rules (1997) as the legal foundation of EIAs

Environmental Conservation Act (1995)

1. Assistance from law enforcing agencies
2. Polluters pay principle
3. Formulation of environmental guidelines
4. Claim for compensation by affected people
5. Penalties for violation of project approval conditions
6. Offences committed by proponents and action against proponents
7. Cognizance of offences and claim for compensation
8. Power to make rules

Environmental Conservation Rules (1997)

1. Declaration of ECA
2. Complaints by community to DG against non-compliance of project approval conditions
3. Power to collect samples
4. ECC procedures with specified time limit
5. Screening of both public and private projects
6. Review of EISs
7. No objection certificate from Local Government
8. Appeal by proponents against order or directions from DOE
9. Determination of environmental standards
10. Fees for Environmental Clearance Certificate process

Sources: Department of Environment (1995, 1997a)

International Conventions, Treaties and Protocols: International environmental laws and policies have implications for the EIA systems of the countries that sign or endorse them (Abaza, Bisset & Sadler 2004). These nonbinding and legally binding agreements (such as the Rio Declaration on Sustainable Development) and conventions establish

important principles and carry various obligations for the signatory countries that may be implemented, inter alia, through EIA arrangements. The agreements signed and ratified by the government of Bangladesh are shown in Box 4.3. As ratified, the obligation for Bangladesh is to comply with these international treaties and conventions on the environment. The EIA is used by the government of Bangladesh as a mechanism to implement substantive provisions under these agreements. Compliance with the provisions of these agreements by the government is often a requirement for projects financed by donors. In this case, the EIA is regarded as one of the most important environmental management strategies.

Box 4.3 International Conventions, Treaties and Protocols relevant to EIAs in Bangladesh

Agreements relating to the conservation of nature and natural resources include:

- Convention on International Trade in Endangered Species (CITES) of wild fauna and flora signed in 1973.
- Convention on Biological Diversity (CBD) signed in 1992 and ratified in 1994.

Agreements relating to the prevention and controls of pollution include:

- Framework on Convention of Climate Change (FCCC) signed in 1992 and ratified in 1994.
- Convention for the protection of Ozone Layer and Montreal Protocol on Ozone Depleting Substances signed in 1992 and ratified in 1994.
- Basel convention on the control of trans-boundary movements of hazardous wastes and their disposal signed and ratified in 1993.

Source: Ministry of Environment and Forest 2008

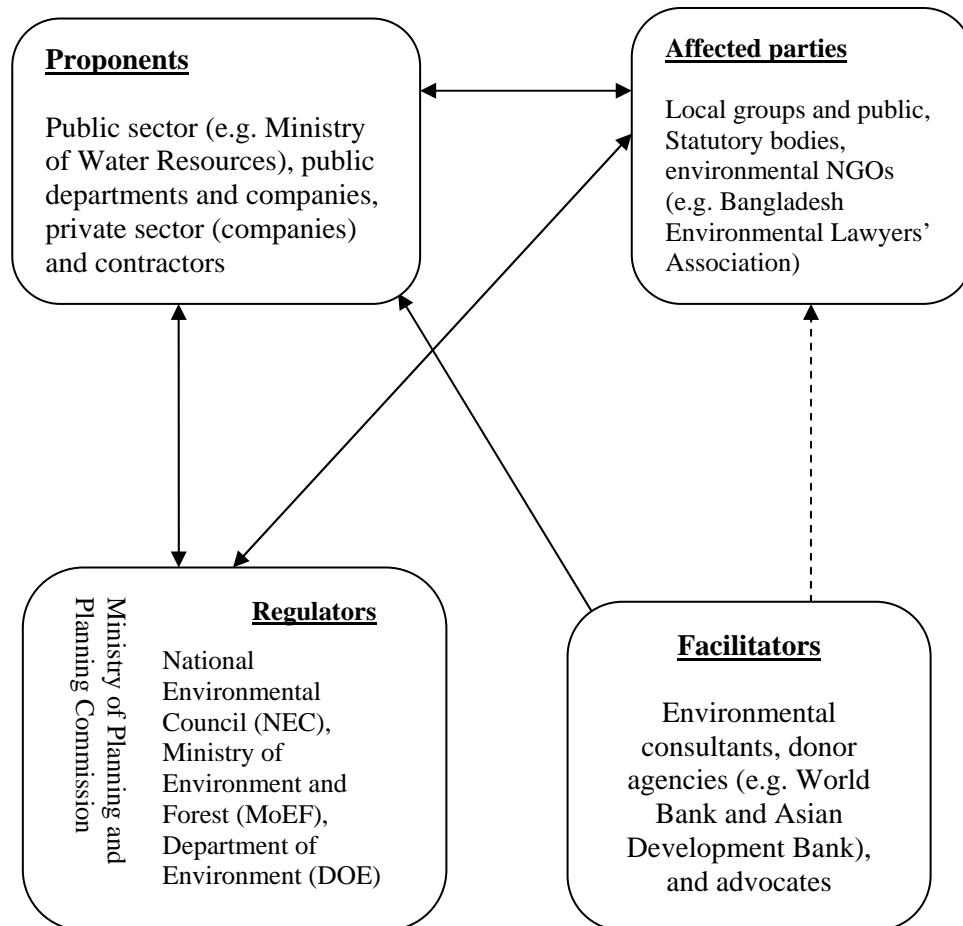
These initiatives, however, have limited significance for EIAs (beyond shaping strategic thinking) until they are implemented through an administrative mechanism. Although legislation often plays a major role in environmental governance, it does not guarantee that its intent will be implemented in practice unless there is a favourable arrangement to enforce it (Lawrence 2003, Lee 2000a, Lim 1985, p.136; Lohani et al. 1997). This, essentially, demands that an adequate administrative arrangement be established within the government so that it is able to successfully carry out the EIA process.

4.2.2 Administrative arrangements

Actors involved in the EIA system in Bangladesh

The administrative framework for EIAs is determined by the variety of participants, their respective roles and their interactions (Lim 1985). Generally, the EIA system involves a number of key stakeholders including project proponents, the public, donor agencies, consultants, review agencies, NGOs, media, project approval agencies, and judicial agencies to administer the EIA implementation. Figure 4.2 shows the actors who are generally involved in the EIA system in Bangladesh. However, only the core government agencies directly involved in administering the EIA process are described below, along with their prescribed roles and responsibilities.

Figure 4.2 Principal actors involved in EIA system in Bangladesh



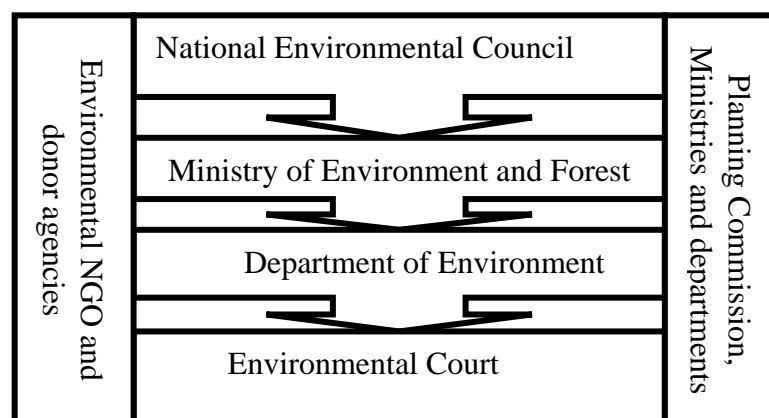
Source: Modified after Glasson, Therivel & Chadwick 2005

Ministry of Environment and Forest (MoEF): Until 1989, there was no separate authority to deal exclusively with environmental issues in Bangladesh (World Bank 2006, p.68). This institutional constraint impeded sustainable use of natural resources as each sectoral agency pursued its own development objectives with little coordination and integration between sectors. The government of Bangladesh set up a new ministry

called MoEF in 1989 with a mandate to protect environmental values against the environmentally damaging activities of other agencies in the public and private sectors.

The main function of the MoEF is to act as the overall guide and custodian for the conservation and development of the environment (MoEF 1992, p. 327). In the pursuit of this goal, the MoEF is responsible for making appropriate plans to ensure the exploitation of natural resources in an environmentally sustainable manner. The MoEF has direct authority to supervise and guide the activities of its subordinate departments including the Department of Environment. It can also formulate policy and rules when and where necessary. The MoEF also bears the responsibility of coordinating and working with other ministries⁴ at national level. This is to ensure that environmental concerns are given due recognition in their development programs and projects. The MoEF is a permanent member of the Executive Committee of the National Economic Council (ECNEC), the highest decision making body for development policy issues and the highest authority for approving all public investment projects.

Figure 4.3 Organisational structure for the EIA system in Bangladesh



Source: Department of Environment 2009

⁴ According to the NEP of 1992, the MoEF is responsible for coordinating with at least 15 ministries whose development activities may have potential impacts on the environment.

National Environmental Committee (NEC): The Government of Bangladesh established a broad-based NEC above the MoEF to provide overall advice on environmental management issues at both national and international level. The NEC is the highest advisory body for environmental management and development. It has the direct support from the Cabinet Division, Office of the Prime Minister and the Ministry of Environment and Forest (MoEF 1992, p.347). The NEC is chaired and convened by the Prime Minister, the Executive Head of the country.

As a multiagency body, it is intended that the NEC serve a unifying role involving facilitating coordination among the sectoral ministries and creating awareness among stakeholders about the effective implementation of EIAs. Members of the NEC include ministers of concerned ministries, heads of other national bodies, such as the central bank of Bangladesh, and representatives of NGOs. According to the policy, the NEC needs to meet at least twice a year and review the progress of activities in environmental management programs and the enforcement of EIAs. This includes, in particular, identifying and remedying inter-ministerial environmental disputes associated with the implementation of EIAs and passing on necessary guidance and directions for solutions (MoEF 1992, p.11).

Department of Environment (DOE): The DOE is the authority responsible for implementing and enforcing EIAs (MoEF 1992, p.327) within the Ministry of Environment and Forest. It is the role of the DOE to formulate EIA guidelines for different sectors. According to the ECA of 1995, the DOE is the authority body that

reviews and approves EIA reports. The DOE has the authority to prosecute any agency or persons who pollute the environment and breach the environmental directions served by the DOE. Thereby, the DOE has been given extensive power to deal with environmental pollution across all sectors (Gain 1998, p.264). In addition to EIA related functions, the mandate of DOE is, broadly, to ensure conservation of the environment, to undertake an assessment and improvement of environmental standards, and monitor and mitigate pollution control.

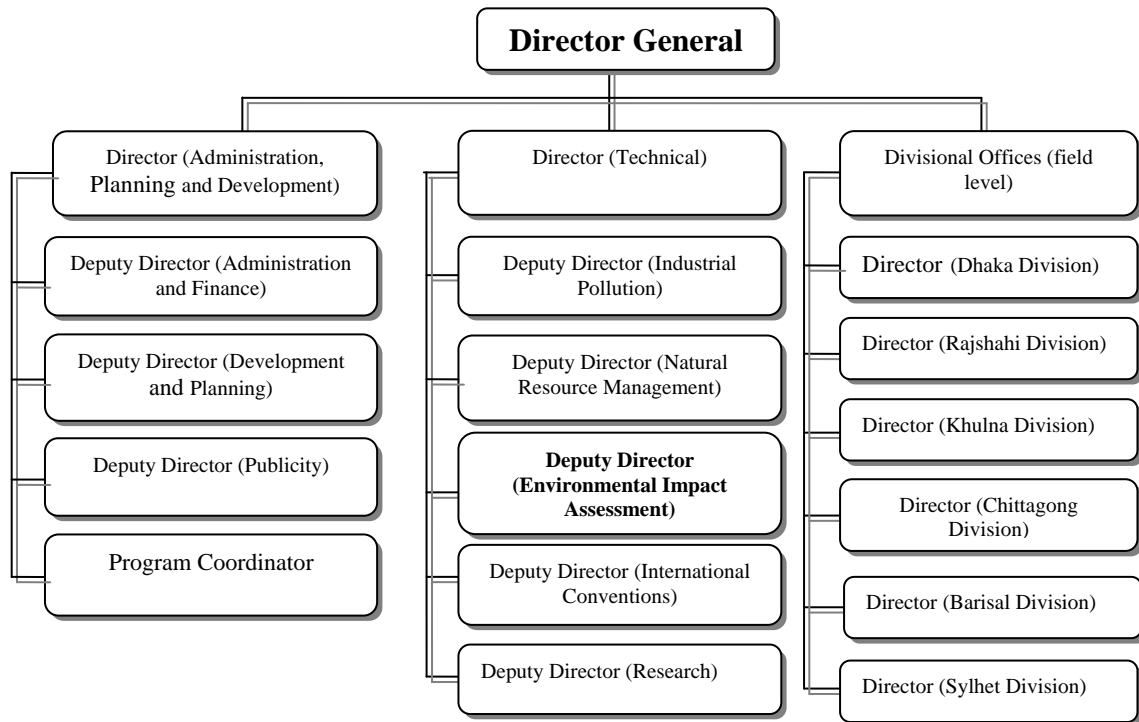
The DOE's role is mandated through the power and function of the Director General (DG) to take such measures as are necessary and expedient for the purpose of implementing the ECA-1995. The most important measures, as determined by Section 4 of the ECA, include the following:

- Coordinate with agencies working at the local level, particularly with those whose activities have environmental and social impacts, and with line ministries at a national level.
- Issuance and direction of orders to the appropriate authority or person for the prevention, control and mitigation of environmental pollution.
- Conduct inquiries and undertake research on conservation, improvement of the environment and any other authority or organisation rendering those matters
- Collection and publication of information about environmental pollution and the creation of public awareness about environmental degradation and quality of life (DOE 1995, p.156).

The DOE works both as a regulator and promoter of EIA implementation. As part of this course of action, the DOE is also expected to contribute to the efforts of other government agencies in promoting EIA. The DOE is facilitating the work of other stakeholders concerned with EIA application, such as in the private sectors, NGOs and the general public. Therefore, the activities of the DOE transcend and cut across private and public sectors, not only in its role as a regulator, but also as a facilitator that provides technical services.

The DOE is headed by the Director General (DG) which is equivalent to the position of Additional Secretary in civil bureaucracy in Bangladesh. The responsibilities of the DG are discharged through the Head Office located in Dhaka and in six divisional offices all over Bangladesh. Figure 4.4 shows the structure of the DOE. Within the office of the Director (technical) there is a unit headed by a Deputy Director (EIA) who coordinates and discharges EIA related services.

Figure 4.4: Current structure of the DOE in Bangladesh



Source: Department of Environment 2009

There are no offices of the DOE at district or Upa-Zilla (sub-district) level, although there are offices of all other sectors both at district and Upa-Zilla levels. A district is an administrative unit consisting of Upa-Zillas (sub-districts) and a division is an administrative unit consisting of a number of districts. There are 8 administrative divisions, 64 districts and 468 Upa-Zillas (sub-districts) in Bangladesh.

Planning Commission: The Planning Commission (PC) is the central planning agency resides within the Ministry of Planning of Bangladesh Government. Its role is to guide the country's development strategy. The Planning Commission is in charge of the approval of development projects formulated under Five Year Plans and supervises the

implementation of these projects. The PC also controls the funding allocation to individual ministries responsible for implementing specific development projects under the government's national Five Year Plan. The Planning Commission has the authority to supervise and coordinate cross-sectoral and inter-ministerial development activities that influence the use of environmental and natural resources (MoEF 1991, pp.102-103).

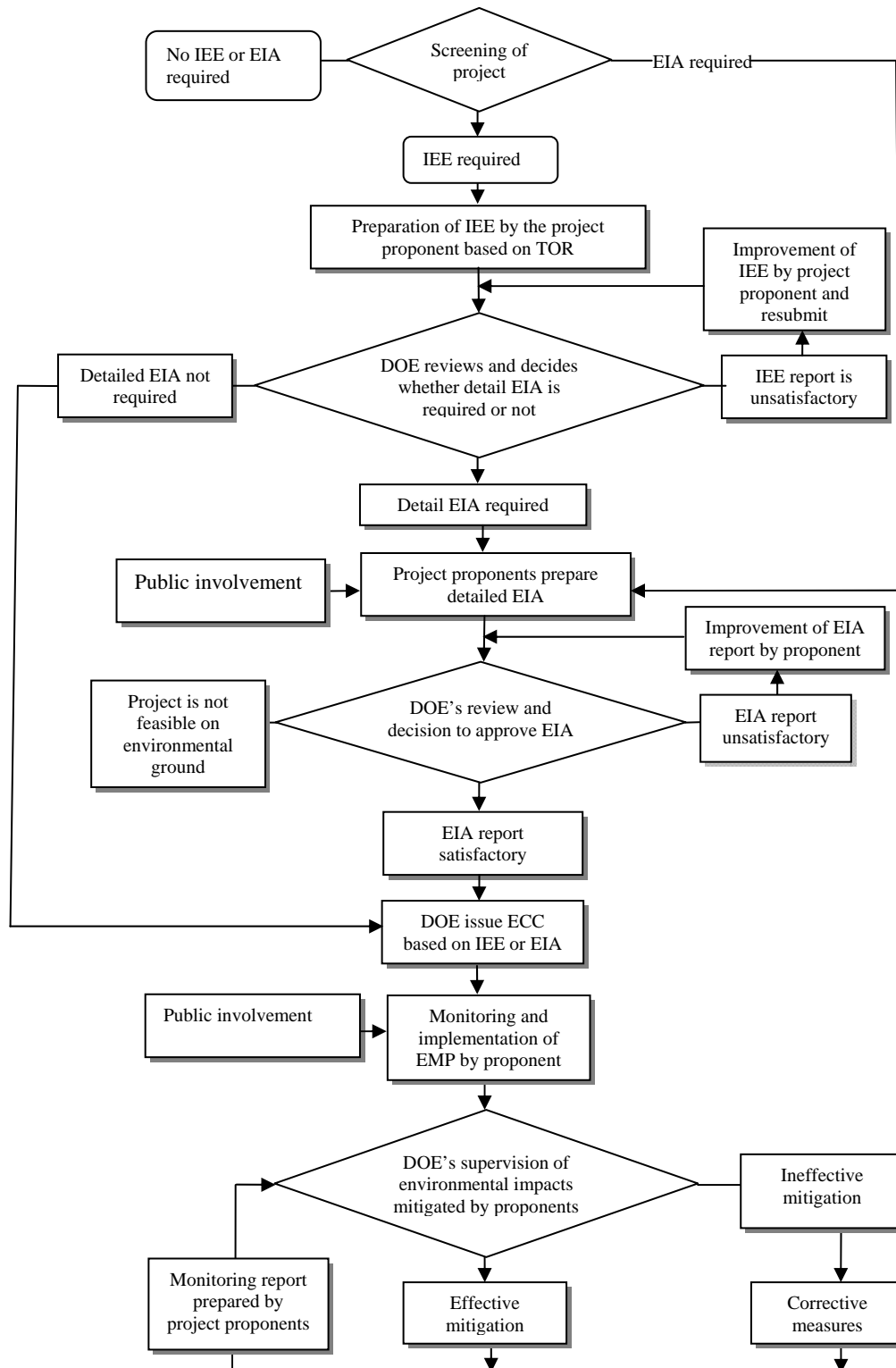
The PC has a substantial influence in the national bureaucracy as it is the highest decision making body for the formulation and implementation of the national development strategy. It is the highest authority for approving all public investment projects through the National Economic Council meetings⁵. Therefore, before the approval of projects, the PC has the role of scrutinising and ensuring that the approved projects are not only financially and technically feasible, but are also environmentally sustainable. The PC also has the authority to monitor and evaluate the progress and performance of the projects under implementation. It also has the opportunity to bring the projects of different agencies into competition with each other and to ensure that the projects are planned and implemented in an environmentally sustainable manner.

⁵ Under the Planning Commission, there is a National Economic Council (NEC) responsible for the approval of projects. An Executive Committee supported by the Planning Ministry provides a secretarial service to the NEC. The NEC chaired by the Prime Minister approves major projects in the meeting that are usually held every month. All ministers and respective secretaries and head of other institutions such as the Bangladesh Bank (central bank) are members of the NEC.

4.3 EIA process and administrative procedure

According to the ECA and ECR, the administrative procedure of EIAs in Bangladesh is controlled and managed by the Department of Environment. The administrative procedure of EIAs in Bangladesh involves screening, reviewing the EIA after submission of the EIA report along with necessary documents, approving the EIA report after review, and, finally, the provision of appeal against the rejection of the EIA report by the DOE. Figure 4.5 shows the EIA procedure in Bangladesh.

Figure 4.5: EIA process in Bangladesh



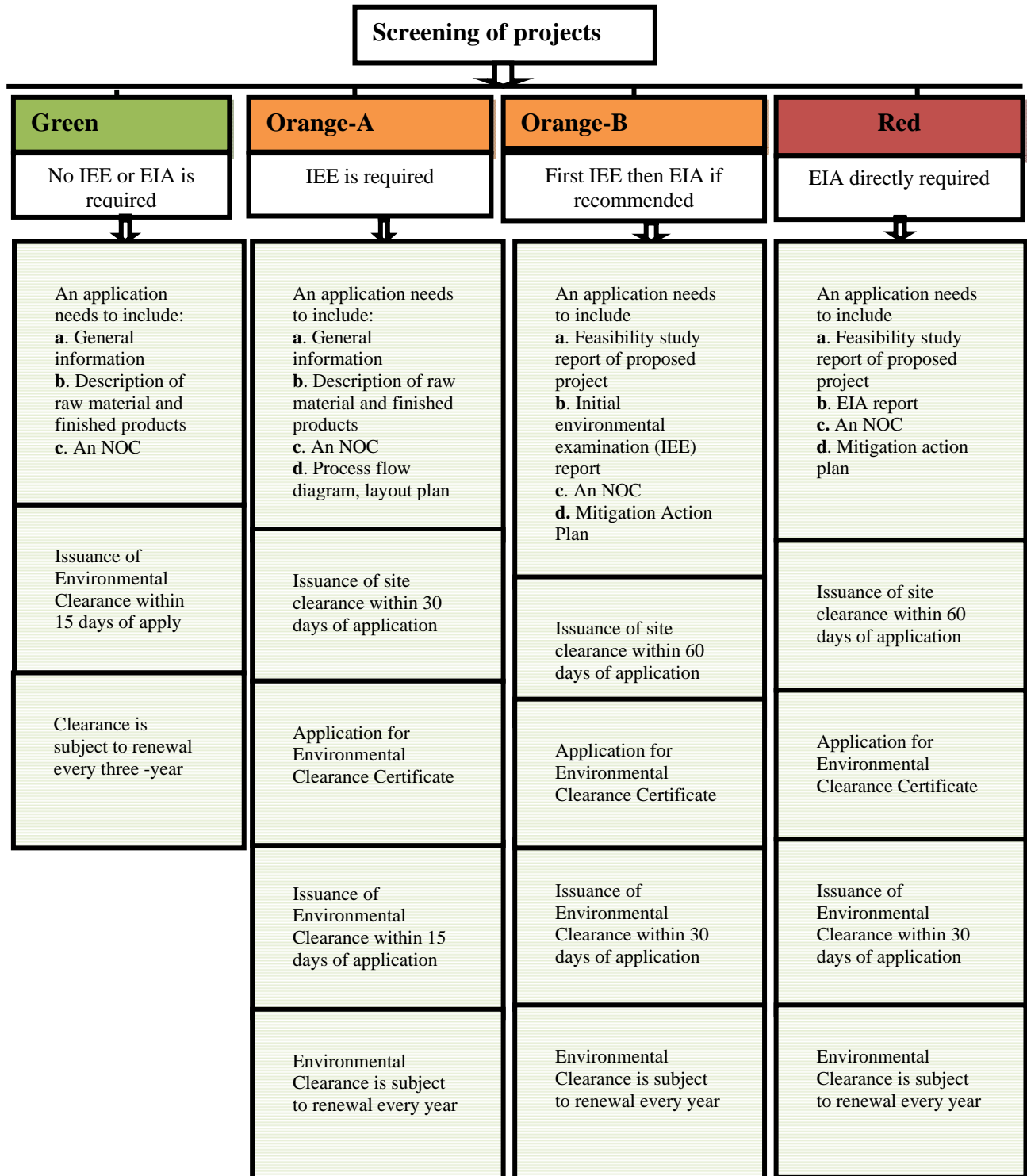
Source: Department of Environment 1997b

Screening: According to the ECR-1997, all development projects are categorised based on their nature, type and size for EIA. The projects are categorised as Green, Orange A, Orange B and Red (Figure 4.6). For projects in the Orange A and Orange B categories, only an Initial Environmental Examination (IEE) is required whereas a full Environmental Impact Assessment (EIA) is required for projects of the Red category. No IEE or EIA is required for Green category projects. However, if the location of a project is close to a declared Environmentally Critical Area or Environmentally Protected Area⁶, a full EIA is necessary, even if the project falls under an Orange A or Orange B category.

Conducting assessment, preparation and submission of EIA reports (EISs): After the screening activity, the proponents are required to develop a Terms of Reference (TOR) for IEE or EIA in consultation with the DOE. The proponent then hires EIA consultants to prepare the EIA report. After the IEE or EIA is carried out, the proponents submit the EIA report to the DOE along with necessary documents, such as the Feasibility Study report, and a No Objection Certificate (NOC) issued by the local government, in order to obtain an Environmental Clearance Certificate (ECC). The approval process and the issuance of an ECC based on the project category are shown in Figure (4.6).

⁶ To date, there are 7 Environmentally Critical Areas (ECA) and 16 Environmentally Protected Areas (EPA) in Bangladesh that are declared time to time by the DOE.

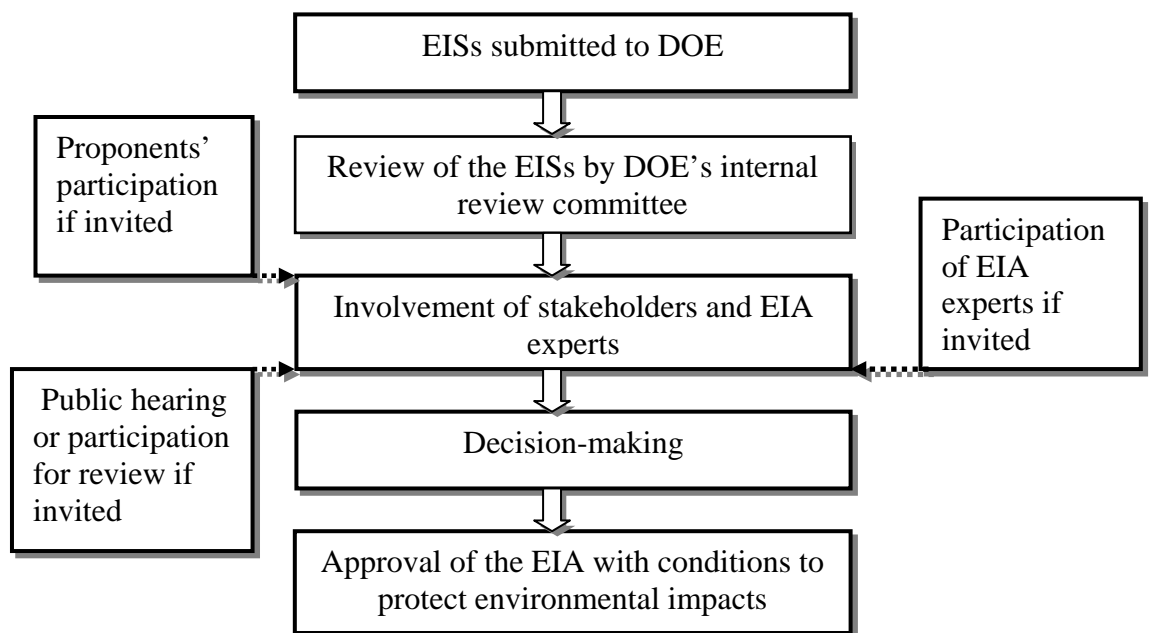
Figure 4.6 Screening and environmental clearance process by the DOE



Source: Department of Environment 1997a

The review of EIA reports and the issuance of ECC: It is the responsibility of the DOE to review the EIA reports. The EIA report is reviewed by the review committee formed within the DOE. The committee consists of DOE officials and is headed by the DG of the DOE. However, the DOE co-opts EIA experts and academics from outside as members of the review committee for any special cases on an ad hoc basis. Based on the review reports, the DG of the DOE decides to accept the EIS, asks for more information, or rejects the EIS. Figure 4.7 shows the review process of the EIA report in Bangladesh.

Figure 4.7 EIS review process in Bangladesh



Source: Modified after Department of Environment 1997b

If accepted, the DOE issues an ECC to the proponents outlining terms and conditions and the proponents are bound to comply with those conditions. The terms and conditions usually require that the proponents take adequate and appropriate mitigation measures as designed in the Environmental Management Plan (EMP). The proponent has to implement the measures appropriately during the implementation and operation of the project. It is the responsibility of the proponents to arrange and monitor the implementation of mitigation activities and report regularly to the DOE to make sure that the project is environmentally sustainable.

Monitoring and feedback: As mentioned above, after the approval of the EIA report and the issuance of the ECC, the proponents' responsibility is to implement the mitigation measures under the EMP during the implementation and operation of the project. The DOE is also responsible for checking and regularly supervising whether the proponent is implementing the EMP as required, particularly the implementation of the mitigation measures. After the implementation of the project, a final evaluation (environmental auditing) of the EIA should be undertaken jointly by the DOE and the proponent.

Penalties for non compliance for an ECC: The DOE approves the EIA report and issues an ECC involving conditions that require compliance on the part of the proponents. The conditions involve effective implementation of mitigation measures and monitoring by the proponents. If the conditions imposed by the DOE are not confirmed by the proponents, the DOE is empowered to take punitive action against the non-compliant proponents. The DOE initially sends a notice to the proponent as a

warning. If the proponent does not rectify the problem after the notice, the DOE can direct the utility service departments, such as electricity, gas and telephone service authorities, to stop supplying all services to the proponent's project. According to the ECR of 1997 the DOE has the authority to fine the noncompliant proponent. The DOE also has the authority to convict the polluters and lodge complaints in environmental courts against the proponents. If the offences are proved the proponents can be punished with a 7 years maximum jail term.

4.4 Findings and discussions

The study identifies both the strengths and weaknesses of administrative and legal arrangements of the EIA in Bangladesh. The key strengths and weaknesses that emerged from the analysis of relevant documents and interviews are presented in Box 4.4. The details are discussed in Sections 4.4.1 and 4.4.2.

Box 4.4: Key strengths and weaknesses of institutional arrangements of EIAs in Bangladesh

<u>Strengths</u>	
Legislative	<ul style="list-style-type: none">✓ Clear legal basis for EIA system (ECA and ECR)✓ Constitutional support for environmental protection✓ Broad definition of environment✓ Clear list of projects for screening✓ Clear timeline for approval of EISs and issuance of ECCs✓ Provisions for penalties for the violation of EIA approval conditions (environmental management focus)
Organisational	<ul style="list-style-type: none">✓ Separate environmental agency (Ministry of Environment and Forest)✓ Clear and adequate power of DOE to implement EIA✓ Incorporation of EIA requirements in national economic development plans and sectoral policies✓ Simultaneous occurrence of EIA with Feasibility Study
<u>Weaknesses</u>	
Legislative	<ul style="list-style-type: none">✓ The ECC needs to be renewed every year✓ Provision of site clearance undermines the effective review of EIA reports✓ No provision for expansion of new projects and renovation of old projects✓ No explicit provision is made for undertaking all stages of EIAs✓ No provision for affected community to directly go to court✓ Environmental quality standards are not up-to-date
Organisational	<ul style="list-style-type: none">✓ Inadequate manpower and budget✓ Leadership crisis and lack of incentives for DOE staff✓ Inadequate interagency cooperation at national and local level

Source: Developed by the researcher

4.4.1 Strengths of institutional arrangements of EIAs in Bangladesh

4.4.1.1 Strengths of legal provisions

Clear legal basis for EIAs: The study shows that there is legislation for the application of EIAs in Bangladesh. The ECA of 1995 and the ECR of 1997 are milestones for the country in terms of preserving the environment through the application of EIAs (Momtaz 2002). The ECA lays out the legal foundation of the EIA framework and the ECR establishes detailed EIA requirements for its application and implementation. The ECA and the ECR have specified the responsibilities of the DOE and the proponents to carry out the EIA. Not only the public proponents but also the private proponents are bound to undertake EIAs for projects that have environmental impacts.

Experiences shows that there are two approaches worldwide for introducing EIAs into the development planning process: the administrative approach and the legislative approach (Hollick 1986, Lohani et al. 1997). There is administrative guidance or directives for EIA application in countries such as in the European Union (EU) countries, Canada or Japan. The administrative approach of the EIA system requires educated and environmentally aware stakeholders where they realize the benefits of EIAs (Hollick 1986). Most particularly the proponents must be well-motivated and have a tendency to comply with EIA requirements on a voluntary basis.

On the other hand, experience shows that a legislative option is desirable in developing countries where environmental awareness is relatively lower among the stakeholders than those of developed countries. By establishing necessary laws, the legislative

option not only forces the project proponents to comply with an EIA application, but also forces other stakeholders to give environmental consideration adequate weight in decision making processes (Ebijemisu 1993). The legal provision of the EIA works as an 'action forcing mechanism' (Ebijemisu 1993) to make agencies responsive to the general goals of the EIA. This also stimulates government agencies, project proponents and consultants into a more rational mode of operation. In addition, the legislative base of EIAs enhances the role of the environmental agency by lending it in the power and credibility it requires (Mulvihill & Keith 1989, p. 405). Therefore, as Bangladesh is a developing country, the legislative approach is appropriate for the development of an effective EIA system.

Clear list of projects and Screening: According to the ECR of 1997, there is a classification of development projects based on specific criteria (such as size, type and location) for projects to be screened. This enables the proponents to decide whether an EIA is necessary and if so, what type of EIA (an IEE or a full EIA) is needed. The lists of development projects fall under four different classifications namely Green, Orange A and Orange B, and Red (as described above). This normative screening process enables the proponents to determine readily which level of assessment is required for the proposed project and which steps to follow in order to obtain an ECC from the DOE. Because of the presence of a clear list of projects, proponents do not require decisions from the DOE as to whether the intended project requires IEE or full EIA. The clear list of projects directly forces the proponents to conduct the IEE or EIA.

The broader scope of an EIA application: The ECA of 1995 defines the environment as ‘the inter-relationships between water, air, soil and physical property and their relationship with human beings, other animal, plants and micro-organisms’ (DOE 1995, p.155). Thus, the definition not only recognises environmental issues, but also the impact of environmental degradation on human beings. The previous Pollution Control Ordinances (ordinance of 1973 and ordinance of 1977) considered ‘environment’ as being limited to water pollution only. The present definition of the environment implies a far broader concern for physical, ecological and social impacts. The scope of EIA application, therefore, is broader in the sense that an EIA should not only assess physical impacts, but also integrate ecological and social impacts.

Involvement of local government into the EIA process: In Bangladesh, the project proponent is responsible for undertaking an EIA. There is a provision that the proponent has to obtain a No Objection Certificate (NOC) from the local government where the project will be implemented and operated (DOE 1997a). This shows a strong commitment from the government to democratise the EIA process by involving the elected local government representatives. According to one interviewee:

‘This provision is a strong aspect of EIA process in Bangladesh. Public representatives as elected by the people are therefore accountable to the public for their actions. Also, people cannot ask the DOE often since the DOE people are not always there. If there is any negative impact on the environment and society, the publicly elected representatives are supposed to answer for that impact. In fact, the NOC from the Local Government is a process of involvement of local people in EIA process and, thereby, an opportunity for screening the projects before it comes to DOE’ (Interview#8).

The provision of the NOC enforces the proponent to involve local people from the beginning of the planning of the project. Through this provision, proponents are liable to the local people for their actions and the projects' environmental impacts on both nature and society.

Public environmental litigation and existence of judicial control: Before 1996, environmental laws only allowed the aggrieved persons or the community affected by a project to go to court to ask for an environmental remedy against the polluters. Since the historic judgement of the Bangladesh Supreme Court in 1996 (see above), any organisation can go to court to sue against the polluter for public interest⁷. It is important to note that Bangladesh has considered 'liberalising standing' in environmental cases, not only to grant standing to mainstream environmental groups and NGOs, but to all citizens. This is especially important given the rights and responsibilities flowing from the constitution of Bangladesh. With this achievement some organisations, such as the Bangladesh Environmental Lawyers Association (BELA), have been encouraged to act against any development activities that are subversive to environmental quality. One is the recent lawsuit by BELA against the government and proponents for not implementing EIAs and for the pollution of the environment by some tannery industries (Alam 2010, The Daily Independent 2009). These activities show that the court is sensitive, as well as sympathetic about environmental damage, and thus, orders proponents to undertake necessary remedial actions. While only eight cases of public litigation have occurred in Bangladesh since

⁷ In the USA there is a provision of court action against the proponents if the contents of an EIS is deficient (NEPA 1969). This delays the implementation of projects since it takes time to resolve the issue. In Bangladesh, there is no such provision, perhaps in order to avoid delays to the implementation of projects. In practice, litigation usually occurs when the EIA is not implemented by a proponent at all or the proponent fails to implement the mitigation measures to protect the impacts of the project.

1996, the promise inherent in the development of public litigation shows the commitment of courts to protect environmental quality⁸.

Environmental Quality Parameters: The effectiveness of the EIA process in protecting the environment also depends on the degree of environmental protection offered by the standards (Lohani et al. 1997). In fact, the formulation of environmental quality parameters serves as the basis for the planning of development projects (ADB 1986), particularly for designing the Environment Management Plan. The environmental quality standards set by the DOE includes both ambient environmental standards and discharge standards (DOE 1997b). The standards determined and described in the ECR of 1997 are being applied nationwide and serve as a national guideline for the monitoring system. The standards set by the DOE are, therefore, comprehensive and applicable to all concerned projects, including industry and other sectors. These parameters have legal force and, therefore, proponents are bound to comply with these standards.

4.4.1.2 Strengths of administrative arrangements of EIAs

Separate agencies (MoEF and the DOE) for EIAs: There is a separate ministry to deal with environmental issues in Bangladesh at the national level and to guide the DOE as one of its sub-ordinate departments. The MoEF is responsible for coordinating with other ministries at national level and, thereby, facilitating the implementation of EIAs.

⁸There are no provisions for lawsuits if the EIS is technically inadequate. Also, there is no provision for submission of draft EISs and public hearings. This may be to minimise the cost of EIA implementation in terms of time, money and manpower.

One minister is appointed by the government to lead the ministry. Within the MoEF, the DOE has the sole responsibility for the administration of the EIA process and for acting as a coordinating one-stop facility for applicants. According to one of the interviewees:

‘The creation of a separate environmental agency reflects the government’s political will favourable to the environmental protection. At the same time, the ministry works as a focal point for policy development and implementation of EIA. Such a ministry also can play a role as communicator of information about environmental issues and EIA in an ongoing conversation with other counterparts (sectoral public agencies, academics, and private sectors). Overall, the pattern of roles of MoEF and the DOE defined by the legal mandate has supported to constitute the essences of an effective EIA system’ (Interview#6).

The important reason for the creation of separate environmental agency is that, in Bangladesh, development activities are compartmentalised by various development sectors. These sectors have specific goals or visions of their own, but their development activities have significant environmental impacts. Because of compartmentalisation, there is always a risk that sectoral ministries may ignore environmental aspects of their development interventions (ADB 1986). Therefore, to streamline and coordinate the activities of sectoral agencies towards sustainable development, a separate ministry was necessary⁹.

Strong authority of DOE mandated by ECA: Within the MoEF, the DOE is authorised solely to implement the intents of the ECA of 1995 and, thereby, the DOE is fully mandated to enforce the EIA. Among a broad range of interests, the DOE is entrusted with the power to establish rules and regulations for virtually all aspects of

⁹ One of the arguments in favour of a separate environmental agency is that its stature and strength give it the independence necessary to be an effective regulator, which remains a critical role in an era when pollution control and clean up are essential. However, in cases where no such central organisation exists (such as in Ghana), serious arguments have been presented against the creation of one more ministry, particularly one that is seen as adding to the stacks of existing regulations and enforcement proceedings at a time when pressures to reduce command and control regulation system have been increasing. Despite this, this model (a separate environmental agency) is used widely in both developed and developing countries (Cooper & Vargas 2004).

EIA procedures. Its rationale and legal authority to exercise technical control over the project planning processes in the public and private sectors can be directed usefully towards achieving the stated objectives of EIAs. The DOE works as the central power for enforcing EIAs with the cooperation of law enforcement agencies and utility service agencies (agencies responsible for gas, electricity and water service). The DOE is authorised to convict and penalise (administrative, civil or criminal) the proponents for their noncompliance with the project approval conditions.

The interviewees in this study emphasised that the presence of an enforcement mechanism prescribed by the legislation promises substantial leverage in promoting the objectives of EIAs. With this in mind, the ECA has clearly mandated the DOE with adequate power to implement and enforce the EIA. The DOE has the power to declare any area as environmentally critical when necessary. According to the ECA, the DOE also has the statutory power to revise and set environmental quality standards. The strength of the legal mandate of the DOE to implement EIAs is a measure of the level of the Bangladesh Government's commitment to an effective EIA system. The immediate power and authorities in the hands of DOE have enabled it to take necessary action on an independent basis, which is necessary for an effective EIA system.

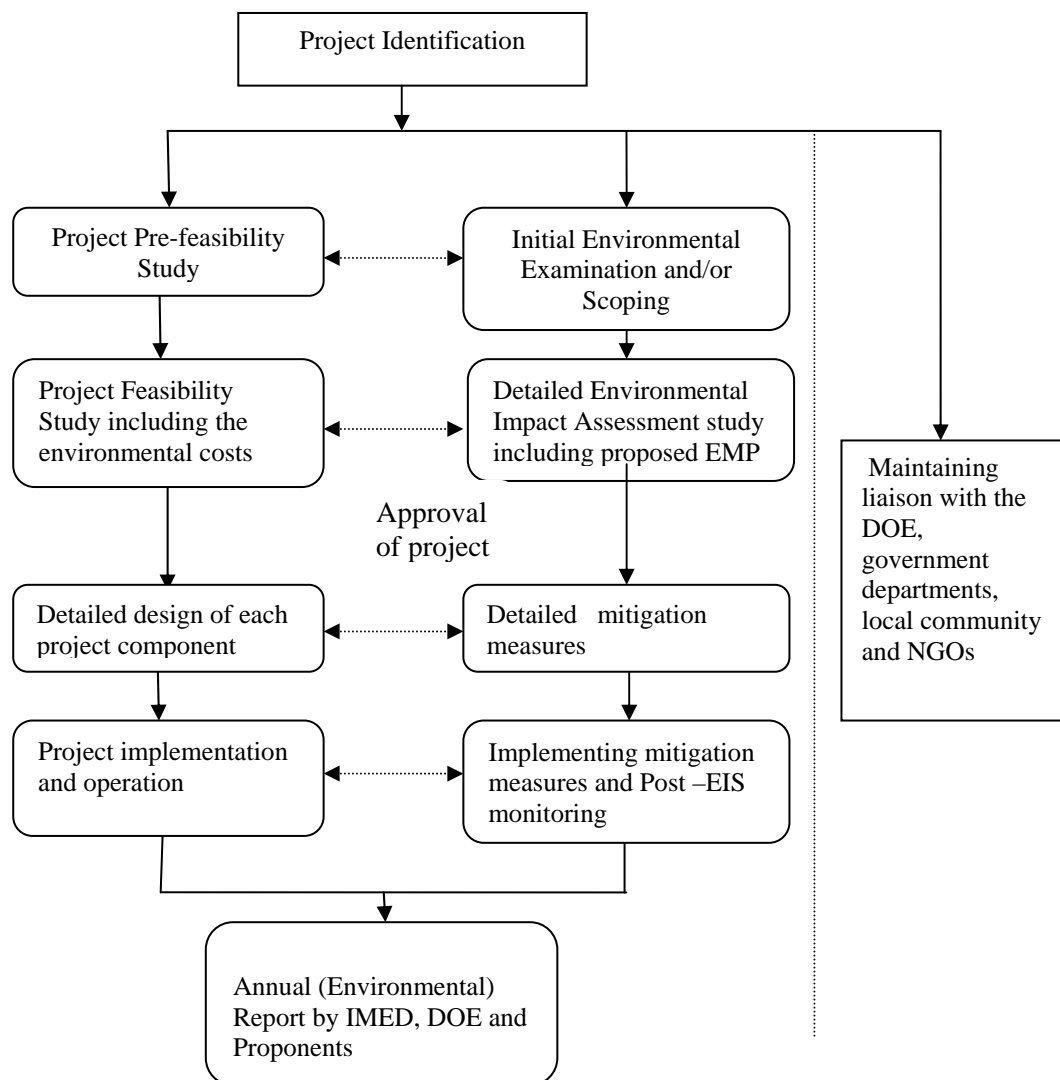
The Environmental Court: Environment courts were established under the Environmental Court Act of 2000 to enforce the ECR of 1997. There are six environmental courts in six administrative divisions in Bangladesh. A first class judicial magistrate is placed to deliver judgments about environment related cases, including EIAs. The Environmental Court Act mandates the jurisdiction of the Environmental

Court (Section 5), the procedure and power of the Environmental Court (Section 8), the right of appeal by the aggrieved person, and the arrangement of the Environmental Appeal Court (Section 12) (DOE 2000). The environmental courts have been established with a view to delivering the services quickly and efficiently that are related to the enforcement of EIAs. In developed countries where environmental courts are established, such as in Australia, Canada or the USA, citizens are enabled to take action against the polluters. Similarly, in Bangladesh, the existence of the environmental court promises an opportunity to force the proponent to comply with EIA provisions.

Involvement of environmental agencies in the project approval process: For public projects, a Development Project Proforma (DPP) is submitted to the Executive Committee of the National Economic Council (ECNEC) in the Planning Commission, along with a project feasibility study report for the approval of the project. The DPP has a section that requires information about the potential impacts of the project and subsequent mitigation measures to protect the environment from impacts from the project¹⁰. Obviously, this section forces the proponent to conduct EIAs parallel with project Feasibility Studies (Figure 4.8).

¹⁰ The Development Project Proforma/Proposal (DPP) has two parts: part-A and part-B. Part-A is the project summary and part-B involves project details. One of the 26 questions (criteria) of the DPP is related to the EIA. Question 22 of DPP needs to answer the question in detail as to whether the proposed project has environmental and social impacts (GOB 2005b, p.14).

Figure 4.8 Integration of EIA process in project planning and implementation



Source: Department of Environment 1997b

Furthermore, the MoEF is a member of both the Departmental Project Evaluation Committee (DPEC) and the Project Evaluation Committee (PEC¹¹). When a project is

¹¹ Two committees are involved in the planning and implementation of a project. These are the DPEC and PEC. The DPEC works as an in-house committee within the proponent ministry and its responsibility is to appraise the acceptability of the proposal in the context of sectoral policies, plans or programs of Bangladesh. It is a 12-member committee chaired by the Secretary of the concerned Ministry. The PEC

designed under a ministry, these committees are formed and are responsible for the implementation and evaluation of the project. The MoEF, as a member of the DPEC and PEC, has the opportunity to raise its voice and force proponents to undertake EIAs and implement the recommended mitigation measures properly during the implementation of projects.

4.4.2 Weaknesses of institutional arrangements of EIAs

4.4.2.1 Weaknesses of legal provisions of EIAs

Experiences in developing countries in Asia and elsewhere suggest that the laws relating to EIAs may be conflicting, ambiguous and inadequate (Mendez & Diaz 2000, p. 52). This is especially so when new laws are developed for the first time. The EIAs in Bangladesh experience this situation. In Bangladesh, EIA laws (ECA and ECR) were developed more than a decade ago. However, any comprehensive revision, amendment or reforms of the laws have yet to be done. Therefore, a number of weaknesses were revealed via interviews with key informants. This leads to the conclusion that legal and administrative arrangements of EIA system in Bangladesh still seem to be inadequate.

Main stages of the EIA process are not clearly defined: While the legislation and policies that underlie EIAs are well founded, the legislation does not spell out EIA procedures clearly and comprehensively. The EIA legislation clearly mentions screening only as one of the stages of the EIA process (ECR of 1997). The legislation

is at the next highest level and is a 12-member committee headed by the Planning Commission. The main responsibility of the PEC is to examine the financial, economic, environmental and technical viability of project and its implementation (GOB 2005, p. 25). The MoEF is a member of both committees. There is an opportunity, therefore, for the MoEF to ensure that the environmental and social concerns are adequately taken into account by the project proponent when planning and implementing the project.

does not explicitly define the procedure of other stages, such as scoping, alternative analysis, prediction and evaluation of impacts, monitoring and auditing. The majority of interviewees affirmed that the requirements of scoping, alternative analysis, mitigation, monitoring and auditing are generic stages of EIA process. According to one of the interviewees,

...these key stages and other procedural requirements, including review process of EIS, roles of responsibilities of actors involved in EIA process should be clearly laid down by the EIA legislation. This could ensure uniformity and consistency of EIA application. Proponents tend to avoid or pay little attention to perform one of the stages of EIA if it is not explicitly prescribed by legislations. They (proponents) think that it is not mandatory. The ECA of 1995 says that DOE will make rules for EIA process but there are no rules for many EIA procedural requirements. The current ECR is very general. Rules should be made for methodological and procedural requirements of EIA process. This is desirable if we want an unbiased and consistent EIA practice in Bangladesh' (Interview#22).

The interviewees also underscored that the ECR does not need to explain the details of methodological and procedural requirements that are pertinent to particular sectoral projects. These requirements can be comprehensively illustrated by the respective sectoral guidelines according to the local needs and nature of the project. However, the generic stages of EIAs and other procedural requirements (the process of review of EIS and community involvement) should be defined by legislation. This will make the requirements legally enforceable. In countries, where the EIA system is relatively matured and better performed, procedural activities are clearly and comprehensively stated by EIA rules (for example, the Environmental Conservation Rules of 2000 in Australia and CEQ NEPA Regulations in the USA). Even some jurisdictions, for example, the Philippines, Thailand and India have promulgated from time to time the regulations for EIA procedures to improve EIA practice.

Validity of ECC: According to the ECR (1997), the ECC is valid for only one year after it has been issued by the DOE (DOE 1997a). According to this provision, the proponents are required to apply to the DOE every year to renew the certificate since the validity of the ECC is for one year only, subject to renewal. As noted by one of the interviewees:

‘...this provision of renewing ECC for one year may be applicable to industrial projects as it is important to check the performance of the industrial project regarding waste treatment or emission discharge each year. In case of a bridge, road or dam project built by the Communication Ministry or Water Resources Ministry, if the certificate is not renewed after one year by the proponents, will DOE break the bridge or dam?’ (Interview #7).

The current provision of renewing the ECC every year, however, is not suitable for these projects. Interviewees expressed their concern that this conflicting provision often raises tension between the DOE and the proponents, such as the Water Resource Ministry or the Ministry of Communication. This provision also increases the workload of the DOE, and causes wastage of time and money for the proponents. In India, the validity of the ECC for a project is a minimum of five years and maximum of thirty years according to the category of the projects (MoEF in India 2000). Therefore, the validity of the ECC for some particular projects should be more than one year.

Absence of the provision of EIAs for the expansion of new or ongoing projects: In Bangladesh, the expansion of a new or ongoing project is a common scenario. When an ongoing project is expanded, the project, together with the expanded section, may cross the threshold limit and, therefore, may be subject to either an IEE or EIA. In this case, the EIA legislation in Bangladesh has not specified whether a further EIA is required for the expansion of an ongoing project. In the absence of this provision, the proponent tends to avoid undertaking more EIA study and redesigning the EMP, despite the fact

that the expansion might have had significant impact on the environment and society. In many countries, such as Turkey, Egypt, and Tunisia, there are legal provisions relating to this issue and these provisions state clearly whether an EIA is required for the expansion of the project (Ahmad & Wood 2002, p.217).

Provision of site clearance: In ECR-1997, under Schedule 7, there is a provision for issuing a site clearance certificate by the DOE for the project proponent before issuing the Environmental Clearance Certificate (ECC). Once the proponents obtain an ECC, they are allowed to undertake development work, such as land development, on the project site. Therefore, the importance of the receipt of an ECC is largely undermined. As pointed out by one of the interviewees:

‘This is a great loophole in the existing EIA rules. In fact, the site clearance allows the proponents to invest their resources at the project site before the approval of EIS and the issuance of Environmental Clearance Certificate. Since the proponent already has invested their resources, it often becomes morally and technically difficult for the DOE to reject the EIS despite its poor quality. Rather, the provision of site clearance opens the avenue to force the DOE to approve the EIA report as soon as possible...’ (Interview#12).

Inadequate judicial control over the EIA system: Although there is an environmental court, according to the DOE (1995) the parties affected by a development project for environmental degradation are not entitled to directly go to court. This requires the affected person or parties to pursue administrative remedies through the DOE. Section 17 (2) of ECA-1995 states:

‘No court shall take cognizance of an offence or receive any suit for compensation under this Act except on the written report of an Inspector of the DOE or any other person authorised by the Director General of DOE’ (DOE 1995).

The consequence of this provision is that the administrative process takes a long time for necessary action against the polluters. According to the ECR there is a provision for

a hearing to be arranged by the DOE. After the hearing the DG of the DOE assigns an inspector to investigate the case and submit a report. If the DG is convinced after reading the report, the victim is then permitted to go to court. This process takes time and becomes lengthier when the DOE does not make it a priority. This provision also may open an avenue for personal negotiation between the DOE staff and the polluter in order to settle the issue and, thereby, 'can become a way of corruption' (Interview#17). The polluters may influence the DOE's decision in favour of them.

Appeal by the proponent against the decision of the DOE: After the review of an EIS, if the DOE rejects it, the proponent can appeal to the Appeal Committee if it is unhappy with DOE's decision. However, the provision can be a barrier to the effective implementation of appeal procedures. According to one interviewee:

'...the Appeal Committee is chaired by the Secretary of the MoEF who is responsible for the function of DOE too. So basically the proponent is appealing to the same judging authority given without any priority. There is no provision to go to court if DOE rejects the Environmental Impact Statements (EIS) and therefore there is a room for DOE to abuse its power' (Interview#13).

There is no provision for an independent Appeal Committee in Bangladesh. Since there is no independent review committee to review the EIA reports, the Appeal Committee should be truly independent, as suggested by the interviewees.

Lack of adequate EIA guidelines: In an effective EIA system, adequate sector-wise procedural and technical guidelines for project proponents and EIA consultants are necessary (Lohani et al. 1997). The availability of such guidelines may help consultants and proponents to conduct a good EIA. On the other hand, in the absence of EIA

guidelines for dealing with specific sectors of development, the legal adherence may be difficult to achieve (Briffett 1999).

While there are sectoral and technical EIA guidelines available for proponents and EIA practitioners in many countries (Spooner 1998), only four public sectors have EIA guidelines in Bangladesh¹². There are no technical guidelines, for example, for the review of EISs or for community participation in the EIA process. According to one of the EIA practitioners:

‘When we conduct an EIA in a sector, we need guidelines for that particular sector. We need the guidelines to know what the data we need to collect are and how to collect data. In the absence of sectoral and technical guidelines we often follow guidelines of donor agencies but these are very generic and always do not serve local needs. The DOE need to take initiative to produce EIA guidelines, but its response is very slow. In the absence of EIA guidelines we often face difficulties in designing mitigation measures and monitoring, selecting the appropriate methods for identification and evaluation of impacts’ (Interview#11).

It is also important to produce local EIA guidelines since the guidelines would better reflect local conditions, including the laws, institutions, standards, and procedures for the country in question. Second, the process for creating these guidelines may in itself have a useful effect in promoting information flow, awareness and interdepartmental cooperation. Third, although the proponents may follow donors’ guidelines to conduct EIAs (such as ADB and World Bank), these guidelines contain generic issues and may not always be appropriate to local audiences and needs.

4.4.2.2 Weaknesses of administrative arrangements of EIA

¹² These sectors are the: Industrial Sector, Water Resource Sector, Communication Sector, and Local Government and Engineering Division (LGED) Sector. Among the national NGOs, only the BRAC has its own EIA guidelines to implement small scale projects for rural development.

Every EIA system is distinctive as it is always implemented within the political, cultural and socioeconomic conditions of the country of concern. An EIA framework or components from one country (or international organisation) may not be readily imported into another (at least without significant adaptation) (UNEP 2002). Like many other developing countries the EIA in Bangladesh is imported from the western society, however, it has been introduced carefully into the context of Bangladesh with the support of donor agencies. Despite that, some shortcomings in the legal arrangements of EIAs have been revealed (this has been analysed in section 4.2.2.1). Similarly, there are some weaknesses in the administrative arrangements of EIAs in Bangladesh as revealed from interviews.

Inadequate budget for the DOE: The DOE must be regarded as being under-budgeted when taking into consideration its relatively broad mandate, including the implementation of EIAs. For example, the revenue budget allocation for the DOE was less than US\$0.5 million¹³ in 2003-2004. This revenue budget covers only the salary for the DOE staff, limited internal travel and certain basic logistics. There is no adequate and regular budget for activities such as environmental awareness programs, research, and the regular monitoring and auditing necessary for an effective EIA. The DOE depends on donor funds for the monitoring and auditing of ongoing projects and other programs, including research and environmental awareness. However, funds from donors are ad hoc and often uncertain. Therefore, continuous enforcement of the EIA and its improvement become difficult, if not impossible.

¹³ In 2003/2004 the DOE was allocated Tk.13098000 (about \$.5 million) as the revenue budget. The budget for the DOE is only .0957% of the total Annual Development Budget of the Government of Bangladesh (DOE 2009).

There are two departments under the MoEF: the Forest Department (FD) and the Department of Environment. In comparison to the FD, the mandate of the DOE is far broader than that of the FD (World Bank 2006, p. 68). The allocation of the budget, however, is more focused in the FD. A recent study by the World Bank shows that the DOE's annual budget (both in revenue and donors' grants) is 20% of the total budget allocated for the FD¹⁴ although the DOE is mandated to implement the broader part of the activities of MoEF. Moreover, only 30% of the budget for the FD is spent on its staff as the payment of salaries; this compares unfavourably with the 60% of the DOE budget that is allocated for the same purpose (World Bank 2006, p.69). Overall, the budget for the MoEF is only 0.38% of the total national development budget¹⁵. This budget (0.38%) for the MoEF is not distributed proportionately between the DOE and the FD based on respective range of activities. Largely as a result of the focussing of the MoEF's resources on the FD, the institutional capacity for the monitoring and implementation of EIAs, which is the essential function of the DOE, remains weak.

Inadequate manpower and structure of DOE: While the ECA-1995 assigned the DOE with broader environmental responsibilities, DOE's manpower remains inadequate for effectively discharging its responsibilities (Table 4.1). With the increase in its responsibilities over time, the DOE has continued to be understaffed. The volume of the tasks of the DOE has increased manifold over the last 18 years, but its manpower

¹⁴ In the 2003/2004 fiscal year the total allocation for the DOE was Tk. 574 lac where the allocation for the DOF was Tk.10841lac, 20 times higher than the DOE's budget (Hossain & Rahman 2006).

¹⁵ In general, the total budget allocated for the MoEF for environmental activities is only 0.38% of total national budget. The environmental budget for the MOEF has increased from 147.55 crore in 1995/96 FY to 276 crore in 2004/2005 FY. However, during the same period, the allocation in the national budget increased from Tk.22650.92 crore to Tk. 72752.36 crore. The average annual growth rate of the allocation for environmental management (7.20%) in the national budget is estimated to fall way below the growth rate of the total national budget (13.84%) (Hossain & Rahman 2006).

has not increased to accommodate this. To date, the DOE has only 244 staff positions of which only 101 are managerial or technical. This level of environmental agency staffing is lower compared with many other developing countries, such as Thailand, Vietnam, Sri Lanka, and Pakistan (World Bank 2006, p.70).

Table 4.1: Current manpower of the Department of Environment

Classification of manpower	Head Office	Divisions						Total
		Dhaka	Chittagong	Khulna	Rajshahi	Sylhet	Barisal	
Class-I*	34	13	08	07	06	03	03	74
Class-II*	04	10	08	08	07	01	01	39
Class-III	30	14	13	11	11	06	06	91
Class-IV	18	05	05	05	03	02	02	40
Total number of manpower	86	42	34	31	27	12	12	244

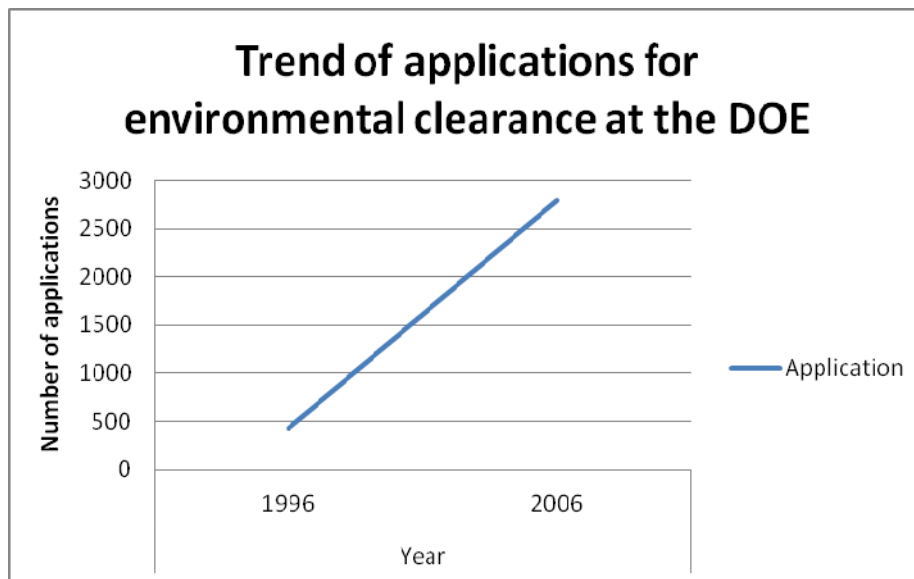
* Classes I and II are professional staff or officers, whereas Classes III and IV are general or clerical staff.

Source: Department of Environment 2009

Although the review and approval of EIA reports and the issuance of the ECC is the dominant function of the DOE, the EIA unit of the DOE responsible for performing these activities is highly understaffed. At the head office, there are only five staff members (two first class officers, one second class officer and two third class office assistants) responsible for activities including reviewing EIA reports, approving of EIA reports and issuing ECCs. At the divisional offices, there are, on average, only two officers responsible for the issuance of ECCs. It is to be noted that these officers must also often perform other relevant environmental tasks (such as legal proceedings against illegal development) when assigned by the higher authority. Thus, the staff members for the effective implementation and enforcement of EIAs are far below the required level.

This is going to become more acute on a day by day basis with the increase in applications being submitted by the proponents each year (Figure 4.9). In 1996, the number of applications for ECCs was 421; the number increased to 2791 in 2006 (DOE 2006).

Figure 4.9 Trend of applications* submitted at DOE (1996-2006)



* All applications submitted for IEEs and EIAs for new projects and for the renew of ECCs for ongoing projects

Source: Department of Environment 2006

The inadequate staff numbers in the DOE responsible for the implementation of EIA adversely affect the effective delivery of service. As pointed out by one of the DOE officials:

‘We often cannot issue Environmental Clearness Certificate (ECC) timely. The proponents become unhappy. The time for processing and issuance of Site Clearance and Environmental Clearance for IEE and EIA always outweigh the actual time specified by the ECR’ 1997. Also given the limited number of staff assigned to review the increasing number of applications for new clearance certificate and renew of certificates, it is difficult for us to issue ECC timely. This often creates misunderstanding between us and proponents’ (Interview#11).

Furthermore, only a limited number of staff within the DOE is assigned to oversee and monitor the implementation mitigation measures at the post-EIA stage. As such, the responsibility for monitoring and oversight is often left to the proponents. This creates risks that the mitigation measures will not be carried out in a proper and adequate fashion.

The DOE is also unable to respond consistently to its complaints, largely due to the lack of well positioned field resources. While offices from all relevant sectors are functioning at district and Upa-zilla (sub-district) levels, in addition to the divisional level, the DOE office is staffed only at the Division level. The DEO office at Upa-Zilla level, if established, could be the ‘eyes and ears’ of the DOE at the grass-root level and could gather data on environmental conditions and carry out monitoring on environmental noncompliance¹⁶ by the proponents. In the absence of offices at district and Upa-Zilla levels, the DOE offices at the divisional level have a large volume of tasks due to the large jurisdiction; this compares unfavourably with the numbers of staff actually available at the divisional offices. The absence of field level DOE offices significantly limits local awareness about environmental issues and the participation of the local key actors.

¹⁶ Under the Ministry of Local Government and Rural Development and Cooperatives, sub-projects are planned and undertaken at rural and urban areas by the local governments such as Pourosova (Town Council) and the Union Council. For many of these projects, according to the Environmental and Social Management Framework recently introduced by the Ministry, the proponents need to undertake an initial Environmental and Social Impact Assessment (Local Government Division 2010). The DOE is the appropriate body in this regard to support proponents in the preparation of EISs by offering technical support and overseeing the implementation of mitigation measures. But the DOE cannot perform this task properly since there is no office of the DOE at the Upa-Zilla level.

Expertise of DOE officials on EIA: In addition to the lack of adequate staff, there is also a lack of staff in the DOE with expert knowledge on EIAs. This affects the quality control of EIA process including the review of the quality of EISs, the design of mitigation measures, and the quality of the monitoring data. In particular, reviewers and decision makers in the DOE must have appropriate training, knowledge and skills to be able to identify flaws in an EIS and advise the proponents and consultants how to improve its quality. However, there is a deficiency in knowledge and skills amongst the staff members in the DOE. According to one interviewee:

‘Often models are used by consultants in EIS to predict impact. The DOE has not adequate capacity to understand whether the model applied is suitable or not in the context of Bangladesh. DOE does not have capacity to understand which models are required and where (sectors/projects) they are appropriate for use. They need special training on models used of impact prediction so that they can effectively suggest the application of models in different sectors. The lack of special knowledge and skills on EIA among the DOE officials affect review process of EIS, effective monitoring of impacts of projects those have environmental and social impacts. The special knowledge and skills are necessary for the DOE not only to play the role of an enforcer, but also to play a consultative role’ (Interview#8).

Furthermore, there is not adequate support from the government for long term training of the DOE staff to improve their expertise and skills, particularly in EIA related activities. There are short term periods (a maximum of three months) of training and seminars offered in other countries and international agencies, but there is the problem of correct matching (the right man for the right training). As pointed out by one of the interviewees:

‘There are lot of international agencies who invite DOE to attend long and short term training, workshops and seminars. To attend these seminars or training, there is a competition among DOE officials about who can go when and where and get best per diem. You get people who have the faintest idea of a subject are going to attend a seminar or a training course. And in the follow-up seminar that happens six months later or one year later, a new person go who do not have any idea to discuss with the previous seminar. Often opportunities to attend seminars or training course are captured by the staff of the ministry and they attend. But they do not have experience suitable for the training or seminar and thus the genuine officer from the DOE is deprived. So there

is no continuity, no specific specialised training and skill development program. Regarding this very ad hoc decision is taken and no realistic skill development program is done' (Interview#13).

Frequent turnover of top officials and unstable leadership: In the DOE, no permanent leadership has been developed. The position of Director General, the highest position in the DOE, is always filled by officials from outside the DOE (usually from the government administrative service). Moreover, the DOE is characterised by the frequent change of its leadership. In the DOE, the stability of leadership has been severely compromised by the fact that this position has been changed more frequently than once a year for the last fifteen years. As mentioned by one of the DOE officials:

‘At the DOE there is a problem with leadership. There is no stable leadership. The Director General (DG) as the head of this department comes and goes out after a few days and even cannot complete the tenure (three years). Some DGs may have problems with academic background, not relevant to handle the environmental issues. Institutional memory is a big issue. When DGs go away they take away the institutional memory too. There are no encouragements among DOE officials. No officials of DOE have been promoted to DG. The DG always comes from outside the DOE. This provision creates frustration among the DOE officials’ (Interview# 8).

In addition, a significant proportion of top level positions other than the DG, such as the Directors and Deputy Directors, are filled by officers (on deputation) from outside the DOE. This is a tradition in the Bangladesh government service. All of these positions are supposed to be filled by the DOE’s officers by promotion. Thus, deputation blocks the promotion of permanent officials in the DOE. This provision often works as a disincentive among the permanent employees of the DOE. ‘This prevents them (DOE’s officials) from being dedicated to their work and, therefore, affects the efficient functions of the DOE in implementing EIA activities and other environmental tasks’ (Interview#13).

The DG and other officials at the DOE come from outside agencies and so often do not have adequate backgrounds or experience in environmental management issues. This limitation compromises the efficient delivery of services to achieve the DOE's goals at large and the goals of EIAs in particular. As pointed out by one of the interviewees:

‘...these deputed officials receive skill development training; attend workshops at home and abroad while working in DOE. However, after a couple of years when they are transferred from the DOE to other agencies, the skills and experiences and the institutional memories they have gained are of no use. This is a loss of institutional memories. Furthermore these officials with little experience and educational background often may think that the issuance of ECC is the only purpose of EIA. This means ultimate goals of EIA, the implementation of mitigation measures and the minimisation of environmental impacts are largely neglected’ (Interview#10).

Weak inter-agency coordination mechanism: Interagency coordination is one of the central attributes of regulatory EIA process management (Ahammed & Wood 2002, Hollick 1986, Lawrence 2003, p.42). Although the ECA of 1995 underscores the need for interagency coordination in order to make the EIA effective (DOE 1995), the formal and continuous mechanism for regular coordination, both at national and field levels has not been developed in advancing the EIA system. There is no provision of regular meetings between the MoEF and the concerned sectoral agencies. Such meetings could help sort out disputes relating to EIA operation as underscored by the interviewees.

According to the interviewees, one aspect of the effective coordination for the implementation of EIAs could be the creation of environmental units in concerned agencies. The creation of an environmental unit in each ministry could provide support for effective coordination and cooperation. Environmental units staffed with personnel who have background in the environment work as focal points on behalf of the concerned agency. This could make it easy for the MoEF to coordinate with sectoral

agencies. However, to date, only three departments have environmental units¹⁷. There are no formal coordination mechanisms, such as monthly meetings between the MoEF and other line ministries at a national level. The weak coordination mechanism at national level between the MoEF and other sectoral agencies often hinders the smooth operation and execution of the EIA regime.

The interviewees also underlined the fact that, at the national level, the NEC's yearly meetings could have a great influence on interagency cooperation and coordination since the council involves ministries, agencies and the private sector. The departures from the national environmental policy or the proponents' failure of compliance with EIA legislation could be exposed and discussed at meetings. To date, only three meetings have been held in last 16 years, between 1993 and 2009 (Interview#13). Furthermore, there is little scope for interagency coordination and cooperation at field level since there is no office of the DOE at district and Upa-Zilla levels.

4.5 Chapter summary

In this chapter the legal and administrative arrangements for the EIA system in Bangladesh were reviewed. The review identified both strengths and weaknesses. The review showed that there is a clear legislative foundation for EIAs along with a separate administrative agency that has adequate legal authority. The review also identified the constraints of the current legal and administrative frameworks that are likely to inhibit

¹⁷ Local Government and Engineering Department, Roads and Highways, and Bangladesh Water Development Board

an effective EIA system in Bangladesh. The study indicates that the EIA legislation (the ECR) does not clearly and comprehensively mention key procedural stages of the EIA process. Some of the EIA requirements mentioned by the legislation are also ambiguous. The DOE, as the EIA implementing agency, is under-budgeted with inadequate staff, unstable leadership and a lack of expert human resources.

Although the institutional arrangements of EIAs in Bangladesh may give a satisfactory impression of the EIA system having a good foundation, the institutional arrangements are insufficient to represent the system if the methodological requirements (the stages of the EIA process) of the EIA process are not fully addressed in practice. The real test of an effective EIA system also lies in the implementation of the methodological requirements of the EIA process (Abaza, Bisset & Sadler 2004, p.21). With this in mind, the next chapter (Chapter 5) discusses the quality of EISs in Bangladesh.

Chapter-5

The quality of environmental impact statements (EISs) in Bangladesh

5.1 Introduction

The effective EIA system of a country depends on many aspects, but among these the quality of the environmental impact statement (EIS) is of particular importance (Lee et al. 1999, p.7, Polonen 2006). An EIS is the fundamental indicator of an effective EIA system for the reason that the information presented in the report reflects the technical and scientific quality of the EIA process. The EIS document is the only way to incorporate and present scientific knowledge in an EIA study. This is a vital element of effective EIA practice (Modak & Biswas 1999) and an important door through which scientific information is brought into the EIA process (Pinho, Maia & Monterroso 2007).

Moreover, Fuller (1999) argues that the EIS is the product of the EIA process and, as such, the quality of the document is likely to be closely associated with the quality of the whole EIA process. This can be supported by the findings of the empirical studies of Wende (2002). In her analysis of the impact of an EIS on the effectiveness of EIA Wende (2002) shows that there is a clear relationship between the quality of an EIS and the effective EIA process (Wende 2002).

The purpose of this chapter is to present findings on the quality of EISs in Bangladesh in order to answer the following question (mentioned earlier in Chapter 2):

Question-2: What is the quality of EISs in Bangladesh? (That is, to what extent are the EIA processes requirements performed in practice?)

In this chapter, Section 5.2.1 describes the overall quality of EISs in Bangladesh. Section 5.2.2 explains the quality of EISs in four main areas. The factors influencing the quality of EIS are discussed in Section 5.3. This is followed by a summary of this chapter.

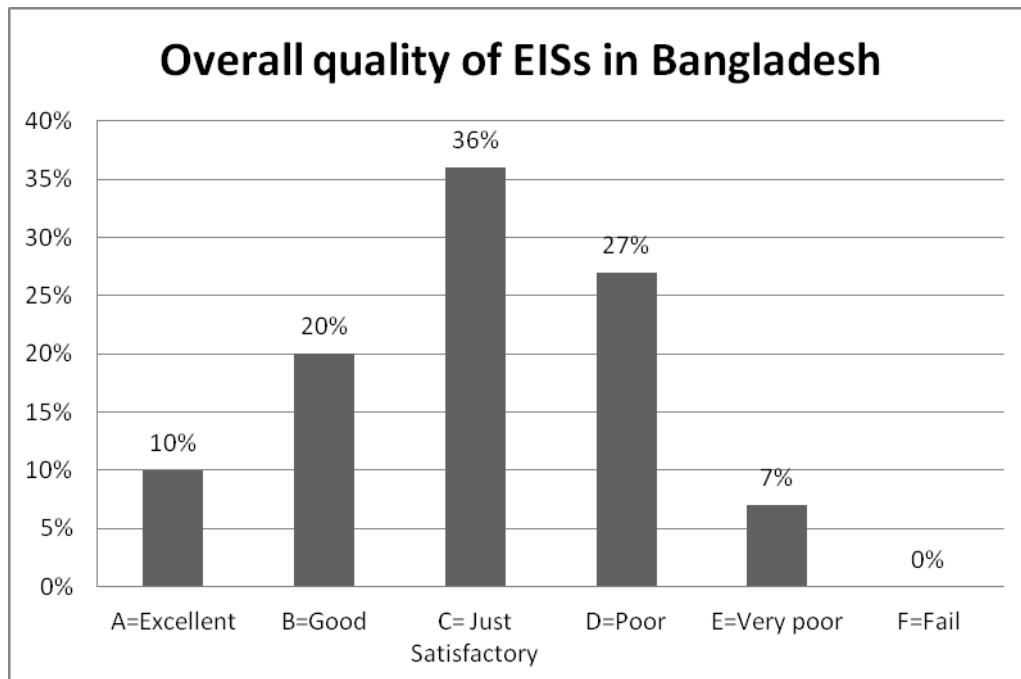
Methodology: The Lee and Colley (1992) review package was applied to assess the quality of EISs in Bangladesh. In addition, the interview method was used to identify factors influencing the quality of the EISs in Bangladesh. Details concerning these methods can be found in the methodology chapter (Chapter 3).

5.2. Findings and discussions

5.2.1 Overall quality of EISs in Bangladesh

Figure 5.1 shows the overall quality of EISs of 30 sampled projects in Bangladesh. From the graph, it can be seen that 66% of EISs are graded excellent to just satisfactory (A-C) and 34% EISs are graded poor to very poor (D-E). No EIS is found with an F or fail grade.

Figure 5.1: Overall quality of EISs in Bangladesh



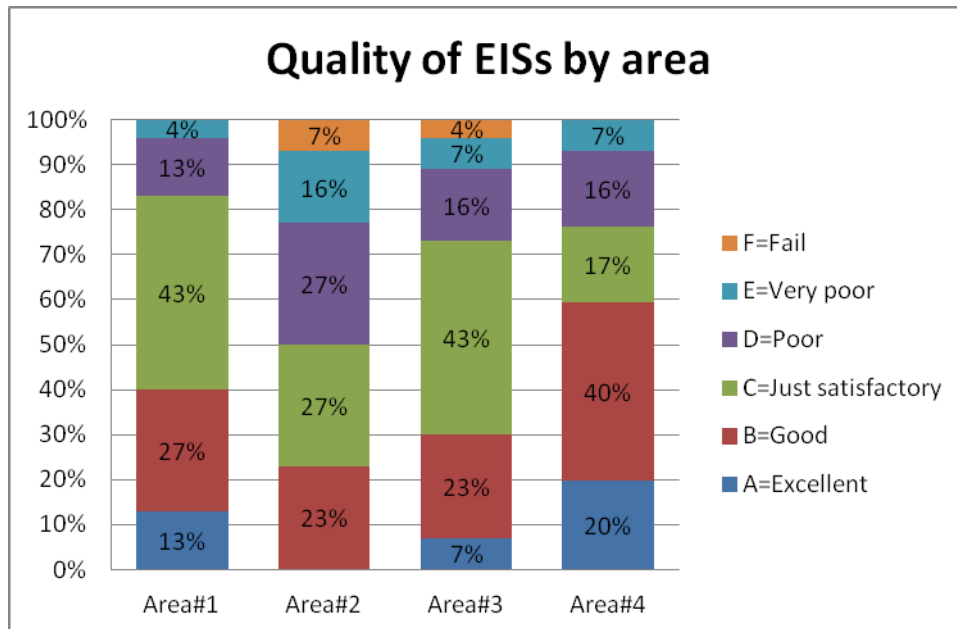
The findings presented in Figure 5.1 reveal that the overall quality of EISs in Bangladesh is ‘satisfactory’ in general (where 66% of EISs are just satisfactory and above). These findings broadly correspond to the findings of other similar studies (for example, Badr, Zahran & Cashmore 2011, Barker & Wood 1999, Cashmore et al. 2002, Glasson et al. 1997, Sandham & Pretorius 2008) where they have found that the overall quality of the EISs of the particular country under examination is generally satisfactory.

5.2.2 Quality of EISs by area

In addition to the overall quality of EISs, more details are required to identify the strengths and weaknesses of the EISs. Therefore, the researcher has analysed the quality of the EISs by area. Figure 5.2 shows the results of the quality of sampled EISs in four areas. The results of the analysis are discussed below under the headings of the four

main review areas. This analysis is important as it helps to identify the tasks that need further attention in order that they be performed properly.

Figure 5.2 Quality of the EISs by area



5.2.2.1 Area#1: Description of development and baseline conditions

Area#1 is one of the two better performed areas in the EISs where 83% of EISs are satisfactory. The relatively straightforward and readily available tasks tend to be performed best. These include the background of the project, the EIA aims and scope, the policy and legal framework for EIA, and the description of the project. Previous studies, such as Lee et al. (1999), Barker and Wood (1999) and Cashmore et al. (2002) have found that such descriptive tasks tend to be of higher quality. However, there are deficiencies in some tasks, such as in the baseline information and the limitations of the EIA study.

5.2.2.1.1 Baseline data

The collection of baseline data on relevant project locations is the most important basis for conducting an EIA study (ADB 2003, p.144). In this study, 100% of the EISs contain baseline data, but the coverage and the quality of baseline information tend to be poor. Data indicates that about 30% (9) of EISs are unsatisfactory. In most cases, collected baseline data is found to be voluminous, all inclusive and descriptive rather than precise. Therefore, it is often difficult for a reviewer to find out which data are exclusively relevant to the potential environmental impacts of the proposed project. This is a significant weakness given that baseline data forms the foundation of the prediction and evaluation of impacts.

Baseline data often becomes voluminous and all inclusive when irrelevant and unnecessary data is collected by the consultants. In many of the cases of the EISs in this study, much less important data has been collected, but the most relevant and important data in relation to the nature and type of the project is missing. For example, in order to consider the potential impact of a gas pipe line project or power transmission line project, it is necessary to collect detailed information on physical or ecological characteristics, such as the deterioration of soil quality and the disturbance of wildlife by the projects. However, the EISs of these types of projects are often found to be deficient of such important information (GOB 2001b, GOB 2005a, and GOB 2008). Similarly, in the case of socio-economic data, much of the data collected are often not relevant and, therefore, not useful for impact prediction. On the other hand, many vital data necessary for impact prediction are not collected, such as the number of female

heads of household or indigenous households who are persons potentially affected by the projects.

The reason behind the collection of all-inclusive, descriptive, irrelevant and inconsistent data may involve the absence of or poorly performed scoping, and the lack of professional knowledge of the data collectors and consultants of what data is required for a particular impact prediction process. Also, in Bangladesh, there are no sector specific technical guidelines available that can be used to decide what data is required for a particular project in that sector.

The baseline information on ecological and physical conditions should be quantitative. This is important, as the accuracy and plausibility of much of the remainder of EISs often depend on quantitative data (Wood 1995). On examination, there is a lack of quantifiable baseline biophysical and ecological data found in many of the sampled EISs. For example, the EIS of Meghnaghat Power Plant Project states that ‘the rate of fish production in the river nearby the project is decreasing’ (GOB 2000) without any statement about the rate of fish production in a quantitative form and with no figures provided on the amount of yearly fish production.

Many of the EISs in this study have claimed that they have collected primary data as well as secondary data in order to fill the data gaps. However, most of the EISs gave few details about the methods used for the collection of primary data. In this case, details were needed including the timing of data collection, the duration of the survey, the nature of the areas or sampling sites, the sample size, and the details of experts who

might carry out the survey. The majority of the EISs in this study stated that the data was collected by 'a multidisciplinary team of experts', but did not provide their academic background and expertise. In conclusion, it is difficult to verify the reliability of data collected from primary sources.

5.2.2.1.2 The limitations of the EIA study

Surprisingly, no EISs provide description of any limitations that may be encountered by the consultants in obtaining details at different stages of an EIA study. This finding can be substantiated by other similar studies, such as by Gray and Edward-Jones (2003). Information on the limitations of studies has great value as lessons may be learned that may provide guidance to other EIA consultants who undertake similar studies. Those acknowledging this sub-category have frequently mentioned only time constraint as the limitation of the studies. Some EISs mention that the EIA study was conducted before the project was fully designed and this affected the study. However, how this issue affected the quality of study was not discussed. Only two EISs state that the consultants encountered technical and organisational or knowledge based difficulties. However no EISs mention details of what could be and should be done to overcome these limitations. This would have helped EIA consultants for future EIA study.

5.2.2.2 Area#2: Identification and evaluation of key impacts

This is the most important area of an EIS as it contains the results of an EIA study. However, this is also the review area with the lowest performance rating where 50 % (15 EISs) of EISs are assessed as being 'poor' and/or 'very poor'. Common deficiencies include limited information about scoping, a failure to provide adequate explanations of

methods or techniques used to predict and evaluate the impacts, inadequate coverage, quantification of impacts, poor evaluation of impact significance, and failure to involve the potentially affected community's input in the assessment of impacts.

5.2.2.2.1 Scoping

Scoping is an important phase in conducting EIAs whereby the geographic regions and issues to be considered in an EIA are determined (Momtaz 2002, p.175). The Scoping exercise is intended to confirm the impacts that are expected to be significant and to determine the time periods and locations over which they must be studied (WARPO 2005). Scoping is found to be either absent or poorly described in the reviewed EISs, although it is widely recognised in more appropriate and relevant EIA studies that scoping can be a catalyst for improvement (Mulvihill & Jacobs 1998, p.376).

In this study, 50% of the sampled EISs are unsatisfactory in relation to the information about scoping. In general, EISs make only brief and poor mention of the scoping process. For example, two (2) EISs from the Water Resource Development Sector and the Infrastructure Development Sector projects state merely that 'a scoping process was undertaken to select Important Environmental Components(IECs) and Important Social Components (ISCs)' (GOB 2001a, p.22, GOB 2007, p.3). The EISs did not mention the scoping process in detail including the methods of scoping, the involvement of stakeholders, the development of Terms of Reference (TOR), data types and sources, and the spatial (and temporal) distribution of potential impacts. These deficiencies are found consistently in the EISs, despite the fact that the absence of scoping or poorly done scoping may result in inappropriate, time consuming, and costly EIA studies.

The involvement of a broad range of stakeholders, including both experts and non-technical persons, is widely accepted to be an essential element of an effective scoping process (Badr, Cashmore & Cobb 2004). However, there is a lack of detailed descriptions about the stakeholders who have been included in the scoping process. Where involvement by stakeholders has taken place, most EISs simply contain a list of stakeholders who have been contacted. It would be better to describe the tools used to engage them and the outcomes of stakeholder involvement.

5.2.2.2.2 Identification of impacts

All of the EISs examined in this study identify the potential impacts of the development projects, but none do it with full coverage. All of the EISs identify social and bio-physical impacts but most of them fail to identify health impacts on the affected people in general and the vulnerable groups, such as children, pregnant women, and the poor in particular. This should be a requirement of EIAs in Bangladesh (DOE 1997b, p.42). In Bangladesh, where people are frequently affected by development projects, this issue should receive serious consideration by EIA consultants. This omission is not unique to developing countries. Results from Steinmann's (2008, p.632) study in the USA show that more than 62% of EISs do not mention health impacts.

Similarly, hardly any EIS makes explicit mention of cumulative impacts (CIs)¹⁸. Bangladesh is a land-hungry country and, therefore, projects are often located closely together, particularly industrial projects. The Industrial EIA Guidelines of DOE suggest the inclusion of the identification and assessment of CIs during an EIA study (DOE 1997b). Therefore, CIs should be identified and assessed by the proponents with due attention. However, few EISs even mention the term. This may be due to minimal attention being paid to the definition of spatial and temporal boundaries for the study and to the delineation of other existing projects in the same environs (Burris & Canter 1997, p.17).

5.2.2.2.3 Prediction of impacts

Once the impacts are identified, a range of methods is employed to predict impacts. The use of a number of methods increases the credibility of impact results derived from an EIA (Momtaz 2002, p.175). The methods may range from a simple checklist to complex mathematical models. All of the EISs in this study have used either the checklist or the matrix method to predict impacts. These methods are popular and used widely in all of the jurisdictions where EIAs are practiced. However, despite their popularity, these methods also have limitations. It is not possible to identify indirect effects using these methods (Lohani et al. 1997, Modak & Biswas 1999) and these methods can be used subjectively (Momtaz 2002). However, hardly any of the EISs reviewed make any reference to these limitations.

¹⁸ Cumulative impacts (CIs) typically result from the interaction of a number of projects concentrated in a particular geographic area at a time or over a period of time (MacDonald 2000, Modak & Biswas 1999). The impact for an individual project may be minor, but can be found to be significant when collectively assessed for a number of projects in a geographic or temporal perspective.

Some of the EISs have used mathematical and physical models, in addition to the methods mentioned above, to predict physical and ecological impacts. In this study, however, the EISs make little mention of any justification for using these techniques. A model may not have uniform applicability in all countries due to differences in legislation, procedural treatments, baseline data, environmental standards and socioeconomic situations (Canter & Sadler 1997). Therefore, the selection of these models must take into consideration the context where they will be applied. This is also important in the case of Bangladesh where there is a shortage of skilled people to operate the models. Also, data and resources to be used for the successful operation of models are limited.

From the EISs reviewed, it can be seen that ‘expert judgement’ is the dominant method used by the consultants for the prediction of impacts. Expert judgement is quick and cost-effective and, therefore, popular in developing countries. Where impacts are not quantifiable, such as social or cultural impacts, expert judgement is unavoidable. However, expert judgement becomes more accurate when the EIA experts have a thorough understanding of the scientific process involved, familiarity with the particular characteristics of the receiving environment and extensive relevant practical knowledge and skills that are involved in the EIA process. Therefore, the reason behind the use of professional judgement should always be justified in the EISs. Most EISs simply state that the ‘prediction of impacts is the outcome of expert judgement’. The process of reaching a point using expert judgement about the prediction of impacts should be clearly stated to make the findings credible and acceptable (Kontic 2000, p.432). Few

EISs in this review have a complete and clear record of expert judgement in the prediction of impacts.

Where it is possible, the predicted impacts should be stated quantitatively (DOE 1997b, Geneletti 2006, p.265, World Bank 1999). Without quantification, the extent of the magnitude of impacts cannot be properly explained or made credible. It is difficult to quantify social and cultural impacts (Momtaz 2002), whereas physical and ecological impacts are easy to quantify. However, this study has found that in many EISs a number of impacts are not quantified, though this would have been possible. For example, the EIS of a road project (Government of Bangladesh 1996) simply states that habitat would be lost, but does not provide any precise description in quantitative form. Quantification of impacts facilitates impact monitoring at the post-EIS stage in the EIA process.

5.2.2.2.4: Lack of adequate assessment of social impacts

A lack of effort in identifying and predicting social impacts in detail is observed in the EISs reviewed. The importance of the social impact assessment is given strong recognition in the EIA guidelines of donor agencies (Asian Development Bank 2003, World Bank 1999). Also, one of the requirements of the DOE is a description, with due care, of social and cultural impacts in the EISs. As the DOE states, 'It is necessary that social and cultural impacts are given the prominence they deserve in describing the changes expected to result from major development projects' (DOE 1997b, p. 26). The analysis and presentation of social impacts may provide an impetus for achieving the same level and quality of assessment for such impacts as is given to biophysical effects (Chadwick 2002, Lockie 2001, Lockie, Momtaz & Taylor 1999, Momtaz 2003, Momtaz

2005, p. 41). The assessment of social impacts, being given due care, is important in a densely populated countries (983/sq.km) like Bangladesh (Bangladesh Bureau of Statistics 2005), where project interventions frequently have effects on the inhabitants.

While considering social impacts, all of the EISs focus on the displacement of people, loss of houses, lands and other sources of incomes (for example, loss of commercial fishery), and changes in status and employment. These impacts are identified and predicted, but with the simple assumption that all people irrespective of their status and income will be equally affected.

However, there are vulnerable members of the community, such as women, female heads of household, the ultra-poor, children, indigenous people, and aged persons. Their experience of the impacts will not be the same as many adults or the rich in the community. The capacity for the resilience of vulnerable groups is far less than other groups. In fact, EISs have collected only minimal socioeconomic information concerning these vulnerable groups and, therefore, fail to predict the distributional effect of impacts on them. Thus, the scope and content of social impacts in the EISs are only narrowly defined.

Furthermore, in relation to Bangladesh, socio-cultural impacts should be integrated into every discussion of physical and biological changes (DOE 1997b, p.27). Bangladesh is a densely populated country and most people (70%) live in rural areas (Bangladesh Bureau of Statistics 2005). Here, a significant number of people live below the poverty line. Rural people are closely linked with natural resources for their livelihoods. Given

the close interrelationship between poverty and the state of the environment, it is essential to recognise that the degradation of natural resources caused by a project may essentially make those members of the community vulnerable who depend on it. The EISs under this review barely consider these secondary, but very important, social impacts.

5.2.2.2.5 Assessment of impact significance

The use of the words ‘significance’ or ‘significant’ are found in the EISs under this study without any definition of the criteria used for determining the significant impacts of a project. When used, all too often, the meaning of ‘significance’ is found to be vague and ambiguous. Any exercise in judging the significance of predicted impacts in the EIS (Duinker & Beanlands 1986) must be undertaken in a clear and transparent fashion (Wood 2008, pp. 34-35). The significance of predicted impacts is often judged on the basis of environmental laws or environmental quality standards set by the environmental agency, social perspective, and public opinions. Few EISs in this study interpret the basis of the determination of significant impacts. Surprisingly, many EISs in this study fail to recognise that impact prediction and the assessment of significant impacts are two different stages.

The simplest way of determining the significance of an impact is to compare its predicted value/magnitude with the national environmental quality standard (Canter & Canty 1993, p. 278). There are many qualitative or descriptive environmental and social impacts. Thus the determination of significant impacts is not always possible based on verifiable evidences. Therefore, other criteria such as public opinions and expert judgements are necessary. In that case, the evaluation of the significance of impacts

tends to have a subjective dimension, arising from the integration of the values, experiences, and knowledge of the different actors that perform the evaluation (Antunes, Santos & Jordao 2001). Although subjectivity can never be eliminated, the results of an evaluation of impacts may become more credible if they are obtained by the application of a priori-defined methodology with clearly stated assessment criteria. The EISs in this review scarcely define 'significant impact' or provide any clear descriptions as to why an impact is significant or insignificant.

5.2.2.2.6 Community involvement

The members of a community are a source of valuable local knowledge and they should be involved in EIA process with due importance being attached to their input (Burge 2003, Lockie 2001, Momtaz 2002, p. 42, Momtaz 2006, pp. 94-95; Momtaz & Gladstone 2008). It is mentioned in EIA guidelines (DOE 1997b) that communities should be involved in all stages of an EIA, but the review results indicated that community involvement is one of the most neglected processes. Only 53% of the EISs provide adequate information on community involvement including methods applied for community involvement, the timing of community involvement and concerns of potentially affected communities. The data indicates that 43% of the EISs make little mention of the community involvement in the EIA process and another 4% make no mention at all of any public involvement.

The EISs reviewed in this study showed that tools used for community involvement in the EIA process include Focus Group Discussions (FGDs), workshops, key informant interviews, and public meetings. However there is little explanation as to why the tools are used and how effectively they are used. The review results indicate that the

community is consulted in order to identify environmental impacts. However, there are no clear details about how the community might be involved in other stages of the EIA process, such as in the implementation of mitigation measures and the monitoring process. Some of the EISs only state that the ‘communities were involved during the EIA study’, but do not explain the nature of their inputs and how the inputs have been incorporated into the EIA reports. The deficiency in community involvement in the EIA process was also identified in other studies conducted in Bangladesh, for example, by Ahamed & Harvey (2004), Momtaz (2002), Momtaz (2005), and elsewhere by Formby (1991), and Stolp et al. (2002).

5.2.2.2.7 Uncertainty

Finally, it has also been observed that a small number of EISs mention uncertainty associated with impact prediction and the significance of impacts. Uncertainty in impact prediction arises from a number of factors: a lack of accurate data, a lack of understanding of the behaviour of complex systems, and the imprecise assumptions taken for the application of models to predict impacts (Table 5.1). All sources of uncertainties should be acknowledged in the EISs (George 2000, p.93). Information about uncertainties makes the predicted impacts credible to decision makers.

Table 5.1: Causes of uncertainties during impact prediction, assessment and mitigation

Issues	Causes
Impact prediction	Selection of appropriate models to predict changes; absence of baseline data for model calibration; inadequate models for quantifying or even describing impacts
Impact assessment	Absence of quantitative criteria for impact interpretation, conflicting societal viewpoints on significance of environmental changes.
Impact Mitigation	Limited information on effectiveness of planned mitigation measures; lack of project proponents' commitment to implementation of mitigation measures.

Source: Modified after Canter 1996

5.2.2.3 Area #3: Mitigation and monitoring

All of the sampled EISs contain designed mitigation and monitoring plans within their Environmental Management Plans (EMPs) in order to address the significant environmental impacts of the projects. However, the data indicates that a considerable number of EISs (27%) are still assessed as being unsatisfactory in this area. Common inadequacies include: lack of analysis of alternatives, poor descriptions of adverse impacts of significance to be mitigated; a lack of justifications for the success of mitigation measures; a lack of commitment in public involvement during the implementation of mitigation measures; effective mitigation for social impacts; the costs of mitigation measures; and residual impacts. The consideration of mitigation measures and monitoring are also found to be one of the more problematic areas in other studies, for example, Cashmore et al. (2002), Gray & Edward-Jones (2003), and Sandham & Pretorius (2008). As noted by Cashmore et al. (2002):

‘..The tasks related to impact mitigation measures were often poorly attempted: mitigation measures were frequently not described, or where they described the documentation often fails to clarify how effective they are predicted to be, or justification of this mitigation measures’ (Cashmore et al. 2002).

A lack of consistency has been observed between the significant predicted impacts and mitigation measures designed against those impacts. In the reviewed EISs, it can be observed that some of the impacts are not identified as being significant, but mitigation measures are designed for those impacts. On the other hand, mitigation measures are not taken into account for some significant impacts. The omission of mitigation measures for some significant impacts, therefore, has led to the poor design of mitigation. It is to be noted that inclusion of mitigation measures for non-significant impacts, however, increases the costs of the implementation of mitigation measures.

5.2.2.3.1 Analysis of alternatives

The consideration of alternative options is often neglected by consultants and, therefore, inadequately addressed in EISs (Momtaz 2002). In practice, the site of the project is often selected prior to conducting the EIA. The analysis of alternative options among sites, designs, technology, or input materials provides a major basis for decision makers (Jones 1999, p. 201). In this study, 6% of EISs do not focus on this category at all, and 24% only mention alternative analyses without any detailed description. Only 48% of the EISs have adequate descriptions of analysis of alternative courses of actions, but most of them are limited to a ‘no action’ alternative. Only 30% of the EISs contain descriptions of all possible options for alternative project designs. For example, the KJDRP has analysed alternative design options using multi-criteria analysis (GOB 1998).

In many cases in Bangladesh, project sites, such as roads and high ways, bridges and industry, are selected politically rather than based on environmental grounds. Therefore, the assessment of alternative sites often becomes a formality without detailed justification. The consideration of alternative locations from an environmental perspective, however, is essential in planning projects and minimising environmental impacts of projects (Jones 1999, p. 203). The exception can be in those projects where the choice of alternative sites is limited, for example, for a mining project or an industrial project in an Export Processing or industrial Zone.

In addition to the evaluation of alternative sites for project, EIA studies should focus on the analysis of best alternative technologies and input materials for production process to avoid potential environmental impacts of a project. However, the EISs in this research have not taken these alternative options into consideration with due care.

5.2.2.3.2 Mitigation measures for social impact assessment

In this study, the mitigation measures designed for social impacts are found to be inadequate. In Bangladesh, as it is one of the most densely populated countries in the world that also contains a vast amount of unplanned housing, residents are frequently affected by projects. The displacement of people as a result of development projects is a common scenario in Bangladesh, in addition to the loss of agricultural land and other sources of livelihood.

While the EISs include mitigation measures so as to address socio-economic impacts in terms of cash compensation or resettlement with housing and other facilities, little consideration has been made for the mitigation of kinship, social capital, and sources of income that are lost by the resettled people. These impacts may cause impoverishment risks, particularly for the poor and the vulnerable (for example, single women as the heads of household) (Cernea 1997, Cernea 1999, Cernea 2003). Only a few EISs in this study have mentioned these issues and designed mitigation measures to address these issues.

The mitigation measures for each significant impact (ecological, physical or social) need to be clearly outlined with the justification for its likely success. This helps decision makers to understand that the action to be taken will be successful in addressing the environmental impacts. However, there is a lack of detailed information in many of the EISs in this study. Some mitigation measures are described in detail and some are not. For example, in addressing ecological impacts, many EISs merely state that ecological damage or loss will be offset or replaced. However, no detailed information has been supplied as to how and to what extent the impacts will and can be mitigated. There is little information about the techniques to be used to restore the ecological damage, the estimated time to restore or replace the damage, and the costs of achieving an acceptable degree of mitigation. Therefore, it is difficult for the decision makers to conclude whether the mitigation measures designed are feasible in addressing the respective predicted impacts.

5.2.2.3.3 Monitoring program

All the EISs in this review designed monitoring programs within the EMPs, but many of the EISs poorly describe the monitoring activity. Without an appropriate monitoring program, it will be difficult to build up the knowledge and experience that is required to improve the effectiveness of mitigation in the future and the EIA system at large (Treweek 1996). Where details of mitigation measures are included, they are of little depth and yield a little information relating to the objectives of monitoring, the parameters to be monitored, and the clear responsibilities of stakeholders involved in the monitoring process. It must be particularly noted that social parameters are largely omitted.

Of the EISs reviewed, few adequately prescribe the ecological, social and physical parameters that can be monitored during and after the implementation of mitigation measures. Furthermore, 40% of the sampled EISs do not clearly specify the roles and responsibilities of environmental agency, donor agency, community and the proponent to implement mitigation actions.

5.2.2.4 Area#4: Communication and presentation of an EIS

The communication and presentation of an EIS is one of the two better performed review areas. In this case more than 77% of the EISs were graded satisfactory in general. Many previous studies, such as Cashmore, Cristophilopoulos and Cobb (2002) and Sandham and Pretorius (2008), have found that tasks related to general structure, lay out and presentation of an EIS tend to be performed well. In this study, all of the EISs include executive summaries or nontechnical summaries (NTSs). Definitions of

technical terms are given, thus aiding better comprehension. Most of the EISs use maps, pictures, tables and charts that make the report well organised and understandable. Also the EISs are found, on average, to be 200 pages in length. This creates a positive impression for the reviewers when reading the EISs. It must be noted that EISs with a large number of pages may take too much time for the reader to identify the actual information required for decision making. On the other hand, EISs with too few pages may fail to present an adequate amount of required information. In this study, only a few EISs are found to be either too short or too long.

Despite the glossy paper-bound reports, there are still some deficiencies in this area of EIA reports. When undertaking this study, it was observed that neither the EISs nor the nontechnical summaries are understandable to all non-specialists. One important reason for this is that the reports are not written in Bengali, the language of the people of Bangladesh. EISs in Bangladesh are only ever written in English language; therefore, the reports are neither easily understandable nor accessible by all stakeholders, particularly the affected rural community. It must be noted that, as Bangladesh is a developing country, not all of the inhabitants have the same level of education and knowledge.

5.2.2.4.1 Recommendations by the EISs

All of the EISs reviewed in this study incorporated recommendations under executive summary. However, recommendations mentioned in EISs are often found to be inadequate and vague. Therefore, no clear direction is available in a ‘what to do’ format from the recommendations as presented in the EISs. Furthermore, 80% of the sampled EISs contain the name and role of team members involved in the EIA study. However, most of the EISs do not give contact details of EIA team members, but this would assist transparency. The absence of contact details provides difficulties in verifying the accuracy and reliability of the information as provided in the EISs.

5.2.2.4.2 Understandability

Some EISs are difficult to read as they contain volumes of data. As mentioned earlier in this chapter (Section 5.2.2.1.1), some EISs include irrelevant baseline data and appendices with a minimum of useful information. One EIS for a public project that was reviewed as a part of this study is 375 pages in length, but 315 pages are appendices (GOB 2006). Another problem is an inconsistent flow of information. For example, in some cases, identified impacts have not been considered in the prediction and evaluation of significance. There is no explanation why the predicted impacts are not considered. Some EISs have inadequate information and are only 60 or 70 pages in length (GOB 2007), with some of the chapters being only a couple of pages long (GOB 2006). These ‘structural errors’ call for more coordination among EIA team members, as well as the EISs being professionally designed and carefully edited in order to enhance their clarity.

The reason why an EIS fails in its communication might be the attitudinal problems of consultants (Alton & Underwood 2003, Weiss 1989). As Weiss (1989) states:

‘...they (consultants) often fail to target the relevant audience and readers of the EIS. They assume that the work will be read only exclusively by environmental engineers and specialists and each specialised components (social, ecological, biophysical issues) will be read only by persons with that speciality. Therefore, the EIS becomes no more than a compendium of technical details, jargons and mathematical models interesting mainly to readers with appropriate technical background’ (Weiss1989, p.238).

Although many of the readers of EISs are specialists, many other important readers are not. The latter include, of course, the affected community and other stakeholders, such as NGOs. However, the consultants often target the audiences of government officials, donor agencies, and academics and accordingly often prepare EISs using technical jargon and mathematical terms. They fail to realize that EISs are written in order to communicate not only with decision-makers, but also other nontechnical persons. Thus, the quality and effectiveness of EISs are undermined.

Nontechnical summaries included by EISs are useful for readers in readily understanding the impacts of projects and in being able to provide recommendations to address the impacts. In this study, it is found that 30% of the sampled EISs have poor executive summaries or non technical summaries (NTSs). Some NTSs are full of jargons, and insufficient and inconsistent information including inadequate recommendations. Although citizens do not need to understand everything written in a particular EIS, some basic level of understating is necessary. An empirical study by Sullivan, Kuo and Prabhu (1996) in the USA reveals that 70% of EISs were not comprehensible to the citizens. If the citizens do not understand an EIS, the

consequence is that proponents may lose the opportunity to gain credibility among the affected people (Sullivan, Kuo & Prabhu 1996, p. 176).

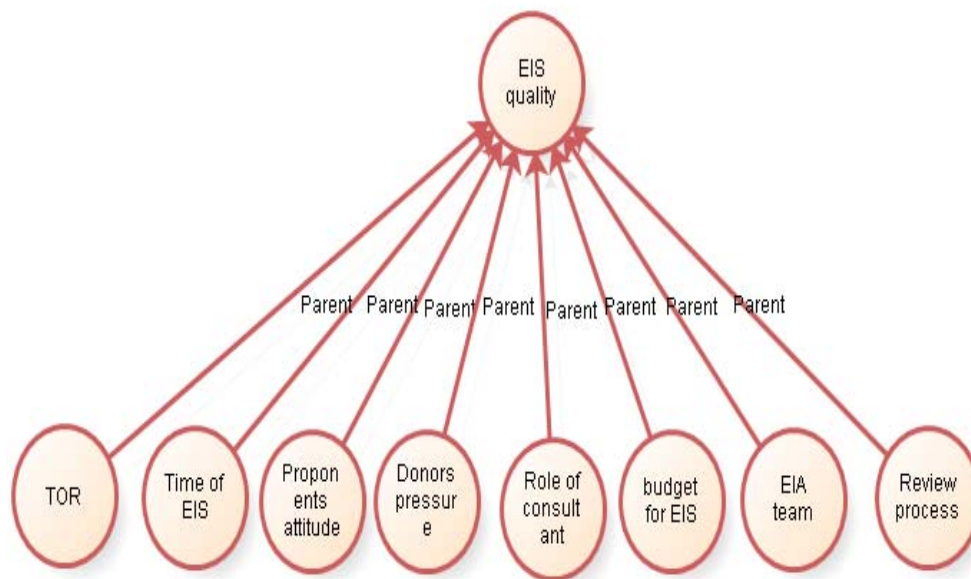
In this situation, people tend to rely on other sources of information including newspapers, television, consultants, and special interest groups who oppose projects owing to interests (Weiss 1989). These alternative sources may convey inaccurate, incomplete and misleading understandings of the project. On the other hand, when the public does have adequate access to EISs they can contribute to designing alternative and effective mitigation measures. In addition to a Non Technical Summary, the EIS must also to be written using simple language that includes minimal technical jargon. There is no practice of publishing EISs in Bengali, the official language of Bangladesh in order to make EISs accessible to the public. At a minimum, the technical summary should be published in Bengali in Bangladesh so as to facilitate basic understanding about the potential impact of a project.

5.3 Factors influencing the quality of EISs in Bangladesh

Despite the fact that the average quality of an EIS in Bangladesh is ‘just satisfactory’, a significant number of EISs (34%) have been found to be ‘poor’ and below poor in grading. In addition, the review results of the quality of EISs by area show that there are deficiencies in information in each area and particularly in the areas of impact prediction, assessment, and mitigation. The major categories of deficiencies include baseline data, scoping, community participation, analysis of alternatives, impact prediction, and impact evaluation. These deficiencies in the quality of EISs can be attributed to a range of factors as mentioned by the interviewees. The interviewees were

asked the question ‘Why and when is the quality of EISs poor’? The factors influencing the quality of EISs in the context of Bangladesh (Figure 5.3) are analysed here based on the information gathered from interviews.

Figure 5.3 Factors influencing the quality of EISs in Bangladesh



Source: NVivo.08 data analysis

NB. The word ‘parent’ in figure indicates that each of the factors (child node) such as ‘EIA team’ is related to the EIS quality (parent node).

5.3.1 Shortage of study time: Shortage of study time is one of the major factors for the poor quality of EISs, as determined by interviewees. Often proponents want to complete an EIA study as soon as possible. Sometimes proponents ask the consultants to complete the EIA study within four weeks. The findings of this study show that the average time for the study of EIAs is four months only, irrespective of the sectors. In some sectors, an EIA study requires at least one year in order to be able to view the seasonal variation and, thereby, assess the impacts on different environmental

components. However, proponents do not want to wait this length of time (one year).

According to one interviewee:

‘... hydrological data for a water resource sector project require one year to be collected to understand the water quality, water dynamics and quantity of water. However, Bangladesh Water Development Board (BWDB) as a proponent in Water Resource Development Sector usually allows only 4-6 months for completing the study which is not adequate for a good EIA. Still there is a lack of idea among the proponents that EIA is a detail work and this needs adequate time to perform the study efficiently and effectively. As a developing country, there is a lack of local ecological data in Bangladesh. Therefore, new survey is often required to fill the data gaps and this is time consuming. To conduct a primary survey for data needs adequate time. Due to inadequate time for EIS preparation, consultants often need to perform their job hastily and therefore compromise the quality of baseline data and subsequent outcomes of EIA process’ (Interview#1).

5.3.2 Inadequate baseline data and access to data: One of the major problems of any EIA study in Bangladesh is that there is insufficient baseline information for social, physical and ecological conditions, at both the national and local level. The lack of publicly available and accurate data complicates the job of consultants. Even when and where data is available, data is often shared on an ad hoc basis among several loosely connected agencies. Often the data is neither published nor catalogued. For example, public research institutions, such as the Soil Research Institute, the River Research Institute and other specialised departments including nongovernment research organisations in Bangladesh, are reluctant to disseminate widely their survey results and findings. Furthermore, the public agencies are often reluctant to provide data or information to EIA consultants. This is because public organisations do not have any obligation to cooperate with private proponents or with consultants who are not part of the government. The consequence of this is that the process of data collection becomes time consuming and costly.

In all of the categories of data, ecological data is found to be more deficient than any other category, such as social or physical data. This is due to a lack of ecological expertise and initiative amongst data collectors of different agencies. As in many other developing countries, the collection of ecological data is time consuming in Bangladesh. There is also the lack of available equipment for the collection of ecological data. One interviewee expressed his concern by saying:

‘We have been doing EIA for many years but I do not see any initiative on how to overcome this problem. Without sufficient database we will not be able to go forward. Our country is ecologically very vulnerable, I believe. Other than any component, the ecological component is most important to me. In the context of our country, ecological assessment in EIA should be done most effectively since the ecological system is now in a vulnerable condition. But there is a lack of quality data. Not only ecology but also other components, for example, the fishery we need to look at. The amount of fish, type of fish, water quality for fish, amount of water and when it is required, velocity of water-we know nothing about this. Just we do our work based on expert opinion’ (Interview#2).

5.3.3 Attitude of consultants and proponents: The quality of EISs is often undermined by clandestine motives of consultants. The objective of an EIS is to care for the environment, thus uncovering the significant adverse effects of a development project. However, this objective is often undermined by the consultants. They often tend to serve the commercial interests of proponents and ignore the actual objective of the preparation of EISs as was mentioned by the key informants. This can be substantiated by the findings of Momtaz (2002) in Bangladesh who stated that:

... ‘their (the consultants) intention is to get an EIA done that would highlight the benefits and justify the proposal in order to obtain environmental clearance from the DOE or from the donor agencies for the purpose of fund clearance. It is therefore the job of the consultants to satisfy the proponent’s requirements rather than carrying out the EIAs to ensure environmental and social sustainability of projects’ (Momtaz 2002, p.176).

There is no code of ethics for the consultants in Bangladesh to control any unethical behaviour, such as preparing EISs with false or misleading information. The opportunity for unethical practice by consultants is compounded when proponents do not have adequate experience or expertise in EIAs despite good intentions and sincerity. Experience elsewhere, for example in China, shows that the existence of the provision of codes of conducts may improve this situation (Wang, Morgan & Cashmore 2003).

The proponents in Bangladesh often have the attitude that an EIA needs to be conducted to fulfil legal obligations or donor requirements and not necessarily to minimise and mitigate the potential impacts of the project. This myopic view is found to be acute particularly among the proponents in the private sectors where the proponents tend to look after their personal profits. Project proponents sometimes consider that getting an Environmental Clearance Certificate from the DOE is the end. They do not realize that the ultimate aim of the application of an EIA is to make the project environmentally viable and to provide good quality information. This is because, according to one interviewee:

‘EIA is not done from the in-depth understanding or any philosophy from the protection of environment. They just touch the points to get the environmental approval for the project. This happens in many cases (projects) as I have seen from my experience over the last decade’ (Interview#22).

5.3.4 Lack of EIA experts: Proponents in Bangladesh hire EIA consultants to prepare EIA reports. However, there is a shortage of EIA experts in Bangladesh. The reasons behind the lack of EIA experts in Bangladesh are multidimensional. The manpower trained in EIAs is not always available for the preparation of EISs. This is because they change their professional field and do not prepare EISs. Indeed there is no scope to

work as a full time EIA expert, because the EIA, as a market, has not fully expanded compared to developed countries, such as Australia, the USA, and Canada.

In the absence of available EIA experts, proponents often tend to prepare the EIA report by hiring junior or inexperienced EIA consultants. Proponents also hire junior consultants when they do not want to spend much money on an EIA. Due to a lack of expertise consultants often fail to understand what information is required to conduct an EIA for a particular project.

For many practitioners, an EIA is not an all day or every day activity, particularly in many developing countries (Fuller 1999). Only in a few countries (for example, the UK), are EIA courses a part of the mainstream qualifications offered by higher education institutions. In Bangladesh, ‘environmental engineers can be EIA consultants without completing courses on EIA’ (Interview#22). Many consultants with a background in Bengali literature or political science claim to be EIA experts after taking short (usually one week) courses of basic training on EIAs. There is also the practice of hiring foreign consultants for EIA studies and, thereby, the shortage of expert consultants in Bangladesh can be supplemented. However, this is costly because of higher service charges.

5.3.5 Defective service procurement process: The Service Procurement Act 2004 in Bangladesh states various methods for the procurement of consulting services in the public sector. Sometimes, the procurement methods prescribed by the Act are not followed properly by the public proponents. In this way, the defective service

procurement processes may occur and, thus, compromise the quality of consultants and thereby the quality of EIA studies, particularly in the public sectors. In many cases, proponents invite Expressions of Interest (EOI) to conduct an EIA based on Quality and Cost Based Selection (QCBS) or Least Cost Selection (LCS), ignoring the Fixed Budget (FB) (GOB 2004). Ideally the EOI should call for proposals from the consulting firms based on the Fixed Budget method to study EIAs (Interview#15). When the bidding is based on LCS, there is less opportunity to improve the technical quality of the study, since the lowest bidder tends to be awarded the contract. With this type of bidding process (LCS) there is a danger of the intrusion of inexperienced and opportunistic firms who have little to offer other than the lowest price to undertake the study (Glasson et al. 1997). This creates problems for reputed firms that cannot bid by offering lower prices as this would compromise the quality of their work just to win a contract. In this situation, a consultant with a good reputation may fail to get a contract, despite having a good quality proposal.

5.3.6 Lack of adequate funds: The quality of an EIS also depends on the adequacy of funding allocated for the EIA study. However, ‘funding for EIS is still very limited even for big projects in Bangladesh. Still there is a lack of ideas among the proponents that EIA is detailed work and needs adequate funds to perform tasks effectively and efficiently’ (Interview#2). Ideally 1% to 2.5 % of the total project cost should be allocated for an EIA study (Modak & Biswas, 1999). In Bangladesh, the funds allocated for an EIA study is less than 1%. According to one interviewee:

‘EIA should not be prepared nominally. It should be a good EIS with adequate budget. In Bangladesh proponents do not want to spend money for EIA. If you even spend less than 1% for EIA study for a US\$10million project, still it is good. In practice, the situation is different here. Ideally, 2-5% of the total project cost should be allocated for EIA. If fund for EIA is adequate, EIS will be good quality and project will be

sustainable. But proponents do not want to do that. The benefits of EIA are yet to be realised by the proponents. Sometimes budget is not a problem, problem is attitude. In practice, a tiny amount of total project cost is allocated for EIA in Bangladesh. While lot of money are spent for technical and financial feasibility of a project, amount of money spent to conduct environmental feasibility is very low. This is due to the myopic attitude of proponents about the benefits of EIA and they tend to perform the EIA to comply with the EIA legislation only' (Interview#1).

Therefore, the allocated funding for EIA is not adequate and the quality of the EIA tends to be low. This is particularly important for privately owned projects and fully public funded projects, compared with donor funded projects. Private proponents often tend to allocate comparatively less money for conducting EIAs compared with other proponents. Private proponents often just hire an EIA expert in order to get the EIA report prepared. In the case of fully public funded projects, the proponents may allocate inadequate funds if the head of the proponent agency is not environmentally sensitive and has no understanding of the benefits of EIAs.

5.3.7 Weak Terms of Reference (TOR): The majority of the informants said that the Terms of Reference prepared for the study of EIAs is often found to be very general and a prototype in nature in Bangladesh. This assumes no variation in TORs for EIA studies, irrespective of the sectors. The scope of the work to be performed by the consultants is described narrowly in this document. Often the TOR prepared for an IEE is found to be the same as for the full EIA. There are four aspects affecting the quality of TORs in Bangladesh: (1) proponents' inadequate capacity to prepare a good TOR; (2) inadequate time for conducting EIA allocated by the proponent; (3) lack of sector specific EIA guidelines; (4) proponents do not submit their TORs at the DOE for approval. One of the interviewees explains:

‘There is no system or expertise yet to be developed among the proponents who are responsible to develop the TOR. There are no qualified proponents to develop a good TOR in Bangladesh due to lack of adequate in-house capacity of the proponent. In practice, the consulting firm to be appointed for conducting EIA is asked to develop a TOR. The proponents depend on the consultants as they have no skill to develop a good TOR. The consultants may not focus on the requirements of environmental information necessary for a good quality EIA. Often EIA is done hurriedly. Therefore, there is not enough time to develop EIA properly. So, there is an obvious deficiency in the TOR of EIA’ (Interview#2).

According to the ECR-1997, the TOR should be finalised by means of the vetting of the DOE. However, the proponents often do not comply with this requirement. In practice, a TOR is often prepared without consulting the DOE. Therefore, this important document may omit many important tasks and thereby becomes superficial or unfocused.

Often the TOR omits important issues relevant to the particular project. This happens, according to the informants, in the absence of sector specific EIA guidelines and technical guidelines. This situation becomes worse when there are new projects. For new projects, such as the establishment of Export Processing Zone or Sand Mining projects, the TOR for the EIA study is found to be weak due to a lack of past experience, in addition to a lack in EIA guidelines in terms of what sort of environmental components the consultants should look at when undertaking assessment and in the nature of the required information (Interview#5).

5.3.8 EIA team

An EIA team plays a vital role in ensuring the quality of EIA reports. An EIA is an interdisciplinary study and, therefore, a team of EIA experts with various backgrounds covering the social, physical and ecological areas is essential. However, in practice, proponents often only hire one individual to prepare an EIA report and this, therefore, affects the quality. According to one of the interviewees:

‘In some cases even only one consultant is hired by the proponents to prepare the EIS. Some proponents are involved in this one-man-show type of practice to cut their budget for EIA. This one-man-show type of EIS definitely tends to be poor as EIA is a multidisciplinary study. EIA should be a multidisciplinary team. For example, we need fishery specialist, ecologist, water specialist, anthropologist and environmentalist for a water resource project. Without a multidisciplinary team EIA should not be prepared. However, some EIA reports are prepared using one consultant only as if, he or she knows everything. This is a deficiency of EIA practice in Bangladesh’ (Interview #1).

In Bangladesh, one of the reasons for the weak presentation and the assessment of social impacts in EISs is the lack of involvement of social scientists in the EIA process. All EISs under this study usually involved a sociologist. No EISs, however, involved an anthropologist in understanding community values and, thereby, identifying the significance of social and cultural impacts. It has been observed that members of an EIA team are often dominated by consultants with backgrounds in physical sciences, including engineers and physical scientists. Ecologists or social scientist are nominally involved. It has also been observed that the team leader selected for an EIA study often has an engineering background. In this case, the team leader may fail to visualize the totality of the environmental impact study because of a narrow range of interests (Canter 1991, p. 378). In this case, the adequate assessment of social impacts may largely be ignored.

5.4 Chapter summary

The purpose of this chapter was to investigate the quality of EISs in Bangladesh as one of the key aspects of an effective EIA system. The findings show that the quality of EISs in Bangladesh is only 'just satisfactory'. This means there are some major tasks that are not performed adequately. Also in this chapter, factors influencing EIS quality in the context of Bangladesh were identified and analysed. Although the quality of EISs is a key indicator of an effective EIA system, even an EIS of excellent quality alone cannot represent a successful EIA regime. This requires adequate implementation of mitigation measures (as recommended by the EISs) at the post-EIS phase of EIA process. The next chapter (Chapter- 6) examines to what extent the mitigation measures are implemented in order to minimise the environmental impacts of projects in Bangladesh.

Chapter-6

Implementation of mitigation measures: EIA practice at post-EIS stage

6.1 Introduction

Implementation of mitigation measures along with management activities, such as monitoring and community participation, is an integral part of an effective EIA system (Marshall 2001, Wilson 1998). It is argued that adequate institutional arrangements and good quality of EISs alone cannot guarantee the protection of the environment, the ultimate aim of EIA. It is important that the mitigation measures are also effectively implemented (Noble & Storey 2005). Effective implementation of mitigation measures arise when all proposed mitigation measures are completely and adequately implemented (Wood 1995). It is the effective implementation of mitigation measures that occurs at the post-EIS stage of EIA process can address the predicted environmental and social impacts of the projects (Cashmore et al. 2004).

The aim of this chapter is to present findings on the status of mitigation measures in Bangladesh in order to answer the following question:

Question-3: To what extent are proposed mitigation measures implemented at the post-EIS stage of the EIA process?

In this chapter, three projects were investigated in order to understand the implementation of proposed mitigation measures. Section 6.2 provides project background, environmental impacts, proposed mitigation measures, and findings on the implementation of mitigation measures in the Khulna-Jessore drainage rehabilitation project (KJDRP). Section 6.3 outlines project background, environmental impacts, proposed mitigation measures of Jamuna multi-purpose bridge project (JMBP) and findings on the implementation of mitigation measures of the project. Section 6.4 presents project description, potential environmental impacts, proposed mitigation measures and findings on the implementation of mitigation measures of Meghnaghat Power Plant project (MPPP). Section 6.5 provides summary information on the status of the mitigation measures of three projects and the role of DOE. This is followed by a chapter summary.

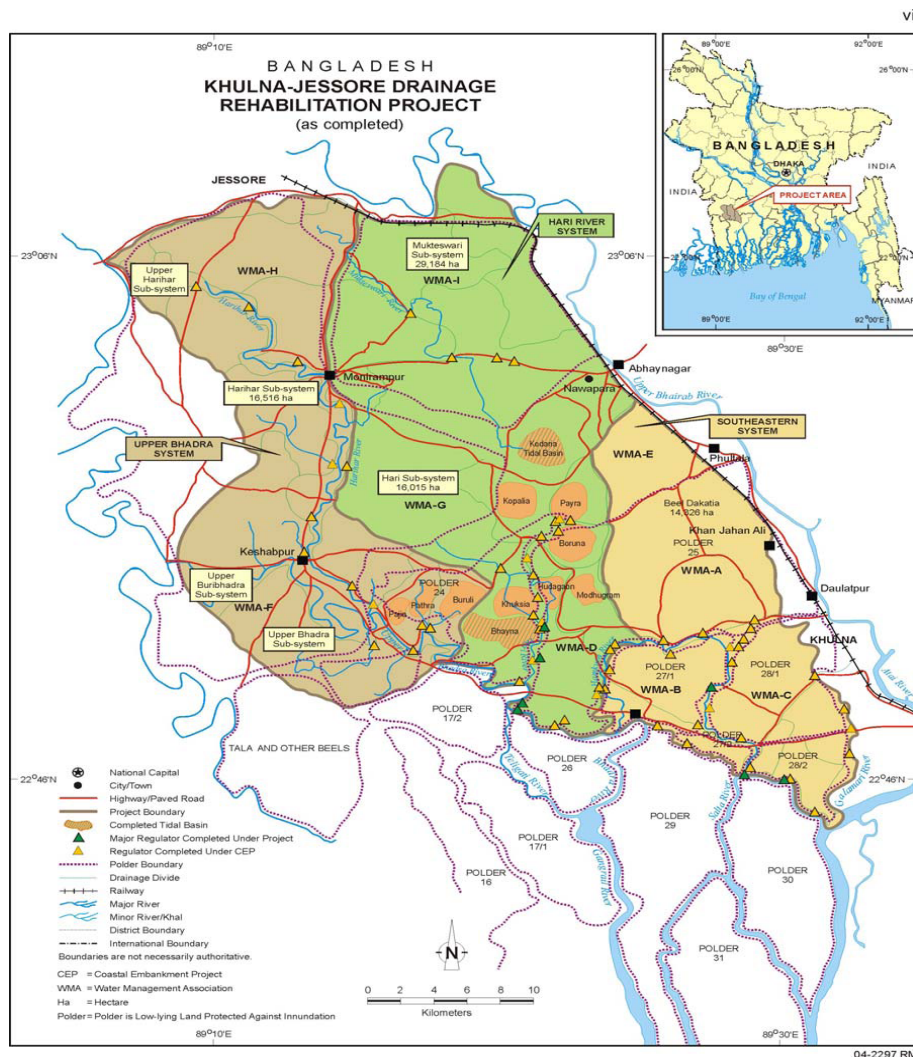
Methodology: Three projects were selected based on: development sector; proponent type; size of the project; year of implementation; and, the possibility of availability of data. All the projects went through the full EIA processes. Each of the three projects was implemented prior to 2004. Data was collected from documents, direct observation and site visits, and interviews with key informants (details in Chapter-3). Finally, a judgement about the extent of the mitigation measures implemented was made based on available data. It is important to be noted that only major mitigation measures for the significant impacts were investigated given the large size of the projects, and the limited resources.

6.2 Case Study I: Khulna-Jessore drainage rehabilitation project (KJDRP)

6.2.1 Project description

Location of the project and environment of project area: The project is located in the south-western part of Bangladesh (Figure 6.1). The area is crisscrossed by hundreds of rivers, tributaries and canals. Fishing and agriculture are the main sources of income for most people in this area. The region is rich in biodiversity with hundreds of species of birds, fish and vegetation. The Bay of Bengal is located to the south of the region and therefore, tidal water plays over the region. Since the region is under the influence of tidal water fluctuations, the soil is still forming through sedimentation carried by tidal water. The region is only one to three meters above the average sea level.

Figure 6.1: Location of KJDRP and area under the project



Source: SMEC International 2002

Project background: The objective of this project was to solve drainage congestion problems and improve agriculture in the project area. The drainage congestion was a consequence of the implementation of a project in the 1960s. Prior to the 1960s, this region was regularly inundated by high tides with saline water that restricted the development of agricultural activities in *beels*¹⁹. Therefore, the Bangladesh Water

¹⁹ *Beels* are large surface water bodies that accumulate surface runoff water through internal drainage channels. These depressions are mostly topographic lows produced by erosions and are seen all over

Development Board (BWDB) constructed a series of regulators²⁰ across the rivers in the project area to control the intrusion and the release of tidal water. The BWDB also constructed a series of polders²¹ to control the inflow and outflow of tidal water.

The project, immediately after its implementation, created an opportunity for growing agricultural crops; however, this benefit did not last long. The installation of regulators across the rivers and canals interrupted the natural flow of tidal water. Water could not get in easily in the project area and spread out over the *beels*. Also, the creation of polders greatly simplified the existing drainage network comprising a large number of tidal rivers and canals of all sizes. Therefore, heavy siltation occurred in the river beds over the years and caused drainage congestion. As a result, during the rainy season, heavy rain-water could not pass easily and a vast amount of land remained water logged all the year round. To solve this congestion problem, an intervention was needed. The BWDB, in response, planned to rehabilitate the drainage system of the area through dredging the rivers, repairing and installing regulators. This intervention was known as the Khulna-Jessore Drainage Rehabilitation Project (KJDRP). The implementation of the project began in 1998 and ended in 2002.

Bangladesh. *Beels* are small saucer-like depressions of a marshy character. Many of the *beels* are dried up during the winter, but during the rainy season they expand into broad and shallow sheets of water, which may be described as freshwater lagoons (Chakraborty n.d.).

²⁰ Regulators are kind of structures built in the open waterways (rivers and big canals) to control water getting in and getting out.

²¹ Polders are low-lying tract of land enclosed by embankments (barriers) known as dikes, that form an artificial hydrological entity, meaning it has no connection with outside water other than through manually-operated devices (Wikimedia Foundation 2011).

6.2.2 Environmental and social impacts of KJDRP and proposed mitigation measures

6.2.2.1 Potential environmental and social impacts

The EIA team, under the leadership of the Centre for Environment and Geographic Information System (CEGIS) carried out an Environmental and Social Impact Assessment (ESIA) with the objective of planning an environmentally and socially sound project (GOB1998). The EIA team conducted extensive consultations with all of the stakeholders using appropriate methods, such as a Participatory Rural Appraisal (PRA) and Focus Group Discussions (FGDs) to identify potential social and environmental impacts.

Tidal Basin Management--an innovative option: During consultation with the local community, the EIA team came to know that the traditional engineering design of the project (installation of regulators and repairing of the existing ones) would have significant environmental and social impacts, as occurred in past projects implemented in the 1960s. Therefore, the local community proposed to implement an innovative option alternative to the regulator option called the Tidal Basin Management (TBM) or Tidal River Management (TRM²²). This is an application of a local method called *jower-vata khelano* (free play of tidal water flow) to the rivers and *beels*. This process allows tidal flow into the *beels* of basins and releases the tidal flow daily back to the river. Based on the local community's demand and potential environmental advantage, the TRM option was also incorporated into the project design. The EIA team identified that the TRM option also had some impacts such as temporary loss of livelihood of

²² The TRM and TBM will be used inter-changeably in this study. This popular concept was developed based on indigenous water management practice developed over generations. The concept later entered into the lexicon of water experts as TRM or TBM.

farmers or agricultural production. Table-6.1 presents the major environmental and social impacts of KJDRP identified by the EIA team.

Table 6.1: Major social and environmental impacts of KJDRP

	Important environmental issues	Potential significant impacts
1	Loss of open-water fish habitat	a. Reduction of fish habitat for spawning, breeding and replenishment. b. Discontinuation of migratory routes under the regulatory options and blockage of natural recharge of nutrients and microorganisms
2	Disruption of agricultural production	Huge amount of dredged material (50,000 to 400,000 cubic metres) will be produced from dredging and excavation of rivers and canals to bring the surface water system under reference conditions. Unplanned dumping of dredged materials will create problems in densely populated areas and will affect agricultural land, settlement areas and communication systems.
3	Quality of water during dredging	During dredging, water quality in the river will deteriorate and, thereby, water users and the habitat in the rivers will be affected.
4	Loss of aquatic habitat for plants and wild life	There will be qualitative changes in habitat under the proposed project. Area of habitat for birds and other species will be reduced.
5	Possible death of Bhadra River and Hamkura River	Installation of new regulators in the Hamkura River and Upper Bhadra river may affect the rivers, and the rivers may die in the long run.
6	Loss of brackish water for shrimp culture	Due to non-availability of brackish water under regulator options shrimp ponds will disappear. Consequently there will be significant loss of employment, production and income associated with shrimp farming.
7	Loss of farmers' livelihood in the TRM option area	During the TRM, agricultural production will be disrupted for the time being (for one or two years) until the level of land of the <i>beels</i> is raised.
8	Land acquisition	A vast amount of land will have to be acquired for construction of regulators. Many people will lose their agricultural and homestead land and, consequently, their livelihood income will be affected. The amount of land to be acquired will be less in the case of regulator options than the tidal basin option.

Source: Government of Bangladesh (GOB) 1998

6.2.2.2 Proposed mitigation measures

In order to address the impacts, the EIA team recommended a set of mitigation measures (Table 6.2) and monitoring program.

Table 6.2: Recommended mitigation measures for KJDRP

	Proposed major mitigation measures	Mitigation actions
1	Protection of open water fish habitat from loss	a. The extreme loss of habitat under the regulator options can be mitigated, keeping more water and releasing fingerlings every year in wetland project area is required. b. Operating regulators in a fish-friendly way to facilitate fish migration.
2	Management of disposal of dredged materials and disruption of agriculture	Disposal material will be spread uniformly over agricultural land at a maximum depth of 35 cm. These materials can also be used for homestead development.
3	Protection of water quality during dredging	Water quality will be maintained particularly when dredging will be conducted during dry season. During the monsoon, dredging will be stopped for some time for the benefit breeding fishes.
4	Protection of aquatic habitat for plants and wild life	Under the tidal basin option, the basins will be maintained as sanctuaries for aquatic plants, fish and wildlife.
5	Prevention of Bhadra and Hamkura River from drying	Creating a tidal basin in the Singha Beel, this will keep the Bhadra River and lower part of the Hamkura River at reference conditions.
6	Protection of shrimp culture in the project area	Extension services should be provided for encouraging fresh water fish culture. Prospects of limited intake of brackish water through small inlets from rivers to the eastern side of the project area should be explored to facilitate some shrimp farming.
7	Compensation for land acquisition	a. Adequate compensation must be paid to all land owners, including material and technical help. b. Vulnerable Group Development (VGD) program should be introduced for affected small and marginal farmers.
8	Protection of farmers' livelihood in the TRM area	Financial support will be provided for the affected farmers till the land becomes fully cultivable.
9	Plantation in the project area to compensate the loss of vegetation	An enhancement plan will include plantation of selected plants including timber, fruits and fuel plants.

Source: Government of Bangladesh 1998

6.2.3 Findings

6.2.3.1 The status of implemented mitigation measures

Implementation of TRM option: The BWDB implemented the project focusing largely on the construction and rehabilitation of regulators. However, it paid little attention to the proper implementation of the TRM option; a preferred option of the local community. The total project area was divided into four basins (clusters) of *beels*. It was expected that in each of the four basins, *beels* would be brought rotationally under the TRM option. This would make the river navigable and raise the land-level of the *beels*. However, the TRM option was implemented only in the Khuksi *beel* and Kaderia *beel* of two separate basins. At present, the TRM of Kaderia *beel* is not under operation and there is no further initiative to bring other *beels* under TRM.

Despite the partial implementation, the TRM option shows better outcomes than the regulator option (Figure-6.2). Discussions with local people and project site visit reveal that the land-level of the *beels* under TRM option was raised after a few years owing to sediments carried by the tidal water into the *beels*. The raising of the land-level enabled the local farmers to cultivate crops throughout the year. One of the members of *Panee Committee* explained the benefits of the TRM option:

‘Under TRM option, it is possible to cultivate about two-thirds of the total *beel* area, whereas in the regulator option area, only one-third of the total area is cultivable. Furthermore, implementation of TRM option is less costly than regulator option because minimum dredging is required. Although local initiative for TRM in the project area is not adequately implemented as per plan, the result is still remarkable comparing with the regulator option’ (KJDRP-Hashem).

Figure 6.2: Benefits of implementation of TRM option



N.B. Water releases from the *beels* without any interruption. The president of *Panee Committee* (local Water Management Committee) explains about the implementation of TRM.

Source: Photo by the researcher from project site visit

On the other hand, where regulator options were implemented (repairing the existing ones or construction of new ones), water flow were limited in the rivers. This came about since tidal water cannot easily go through the regulators (please see next Figure 6.3). The local community is experiencing the same environmental problem as it was before the implementation of the project.

Protection of open water fish habitat from loss: The EIA study has found that the regulator option would have significant impact on fisheries in the project area. To mitigate the loss of open-water fish production, the EIA report proposed for releasing fingerlings every year in *beels* of the project area. This is particularly so where regulatory option is in operation. The study also recommends that the proponent needs to operate regulators in a fish-friendly way. With this in mind, EIA report proposed for the construction of vertical slots in the regulators in order to facilitate fish migration

(GOB 1998). In order to run this environmental management activity successfully, EIA report also recommended training program for the affected community members.

However, the site visits and interviews with key informants of the local community revealed that the project proponent installed vertical structure at a very limited scale to facilitate fish migration. Also the proponents did not operate the vertical slots in a fish-friendly way. For example, it was observed that in the Shibnagar and Modhukhali regulators, proponents installed vertical slots (Figure 6.3) but these were not built or operated in a fish friendly way. Similarly, in the Babadaha and Kaderia *beels*, proponent did not build any fish passes (KJDRP-Mujibul).

Figure 6.3: Regulators without fish friendly structure



NB. Picture shows vertical slots which are not built or operated in a fish-friendly way. Fish cannot easily move through these slots.

Source: Photo by the researcher from site visit

The informants explained that proponent made little attempt to construct fish-passes and their operation. The proponent only rehabilitated the regulators by removing its mechanical defects and making it operational. Many of the riverine fish species migrate considerable distances upstream to spawn and travel back. Since fish-passes were not

built in many of the regulators, this interfered with fish spawning migrations from downstream rivers to floodplains and *beels* in the upstream. Because of the inadequate implementation of the proposed mitigation measure, the loss of fish production could not be offset.

It was not possible to measure the loss of fish-stock quantitatively due to the non-availability of records in the project office or elsewhere. Information from the local informants and other evidence show that the inadequate implementation of proposed mitigation actions was largely responsible for the reduction in fish production within the project area (Figure 6.4). Also one interviewee points out:

‘The BWDB did not take adequate initiative to protect or increase open-water fishery in the project area. Fish fingerlings were released in the *beels* for 2/3 years with the initiative of project proponent. Releasing fingerlings was however suddenly stopped. We did not know why. We did not see any tangible activity from the Department of Fishery to increase the stock of open-water fishery except imparting training to a few fishermen on fishery particularly on shrimp culture and other species such as carp fish. At present a fisherman can catch fish worth of maximum 50 to 60 BDT equivalents to \$US 0.80 daily. It is hardly enough for a poor fisherman to support his family members. Although overall fish production has reduced in this area naturally, mitigation actions proposed by the EIA team could greatly improve the fish-production if actions were implemented fully’ (KJDRP-Hashem).

Figure 6.4: Reduction of fish stock in rivers in the project area



N.B. A few fishermen are fishing in the river since the fish stock has reduced due to inadequate implementation of mitigation actions to protect fishery from loss.

Source: Photo by the researcher from site visit

Management of disposal of dredged materials: Furthermore, proponent did not adequately implement mitigation actions related to the disposal of dredged soils. Site visit revealed that most dredged and excavated soils were piled up on both sides of the rivers (Figure 6.5). The EIS recommended that the excavated soils needed to be evenly distributed to the agricultural land nearby, because the quality of soil was good for agriculture. However, the proponent's did not take adequate initiative to distribute the dredged soils. Therefore, the undisposed dredged soil on the river banks has caused the loss of private agricultural land. This also has interrupted agricultural production.

Figure 6.5: Piled-up dredged soil disrupts agriculture in the project area



N.B. Pictures show that excavated and dredged soil is piled up along both sides of the rivers and occupied cultivable land.

Source: Photo by the researcher from site visit

Protection of Bhadra and Hamkuri rivers from dying: Proponent did not implement mitigation action, related to the protection of Bhadra River and Hamkuri River from dying. The EIA team predicted that the implementation of the TRM option, particularly in the Singha *beel*, would keep the Upper Bhadra River and lower part of the Hamkuri River navigable at reference conditions. Since the proponent did not introduce TBM option in Singha *beel*, the upper Bhadra River and the lower part of Hamkuri River were gradually silted and almost lost their navigability.

Mitigation measures for shrimp culture: Technical supports and services from the Department of Fishery (DOF) were needed to protect the shrimp culture from damage, but the DOF was reluctant to extend their services for the affected shrimp farmers. For example, the EIA document recommended that a study should be conducted during the implementation of mitigation measures to explore the prospects of the intake of brackish water using small inlets from rivers to facilitate shrimp culture. However,

informants said that there was no such study undertaken. The shrimp farmers had to explore the ways on their own in order to protect the shrimp farming from damage and, thereby, their source of income. The informants said that the Department of Fishery (DOF) provided minimum support except imparting training to few community members on shrimp culture.

Land acquisition and compensation: The EIA report recommended payment of compensation to all affected people whose land was acquired for the project. Government acquired 600 acres of land from private land owners. In addition, EIA report proposed Vulnerable Group Development (VGD) program to minimise the sufferings of marginal farmers and to tackle the risk of impoverishment (GOB 1998). The informants explained that BWDB prepared land acquisition and compensation plan in a timely fashion and placed the plan before the ADB for funding. The ADB provided the funds required for land acquisition and compensation. The payment of compensation was adequate to pay full all those who had been affected.

Although the proponent implemented compensation program satisfactorily, the process did not end in time. Land owners had to experience a lengthy and complex bureaucratic process and high transaction costs in order to receive compensation for their land.

According to one of the interviewees:

‘The BWDB agreed to pay compensation to the affected people and paid accordingly. However, the procedure to get the money from Deputy Commissioner’s (DC) office is so complex and lengthy that some affected people still did not get their compensation fully. At least twelve (12) supporting documents are needed to submit along with the application for compensation. Many land owners did not want to go to DC office because of the long bureaucratic process. The payment process could be simple. When a private company takes lease or buy land from land owners, we do not see such complexity because the payment process is simpler. The money should come to Union *Parishad* (Union Council) office from the DC office. Then affected people can easily

get the money without travelling to the DC office, far from here. It takes time and money to travel to DC office. Who will give us money for travel?’ (KJDRP-Hashem).

Implementation of other mitigation measures: From the site visit, direct observation and a discussion with stakeholders it appeared that the proponent did not adequately implement other mitigation measures as recommended by the EIA report. These mitigation measures included: protection of the aquatic habitat and wildlife from loss; the protection of water quality during dredging; the plantation of trees; and financial support for farmers livelihood in the TRM area.

In the case of the plantation program, although there was a plan for the plantation of timber, fruits and fuel plants in the project area under the guidance of proponents and the Department of Forest, no tangible initiative was noticed by the community people. The action was limited to the homestead areas only rather than other areas, such as road sides (KJDRP-Hashem). Furthermore, plantation in the homestead areas was undertaken largely by the initiative of the local people themselves. This activity was largely limited to the plantation of rain trees only. The program could be implemented successfully if there were adequate financial and technical support from the proponents and the Department of Forests as said by the interviewees.

In summary, the above mentioned information provided by the stakeholders of the project, from the site visit and direct observation by the researcher reveal that the implementation of one mitigation measures; that is compensation for land acquisition; was at an adequate level. The proponent partly implemented other six (6) mitigation measures. Two (2) of the mitigation measures, (implementation of TBM option to

protect the Bhadra and Hamkura rivers at their reference condition and the plantation of trees in the project area) were not implemented at all. The Table 6.3 shows the status of the implementation of mitigation measures of KDJRP.

Table 6.3: Status of mitigation measures implemented for KDJRP

	Proposed mitigation measures	Status of mitigation measures implemented			
		Fully	Partly	Not at all	Unknown
1	Protection of open water fish habitat from loss				
2	Management of disposal of dredged materials				
3	Protection of water quality				
4	Protection of aquatic habitat for plants and wildlife				
5	Protection of Bhadra and Hamkura River from possible death				
6	Protection of shrimp culture				
7	Compensation for land acquisition				
8	Financial support for farmers' livelihood in the TRM area				
9	Plantation of trees in the project area				

6.2.3.2 Implementation of monitoring program: The proponent (BWDB) introduced third party monitoring system in order to supervise the implementation of mitigation measures and monitor the social and environmental impacts during the project's implementation and operation. The Centre for Environment and Geographic Information System (CEGIS) was accordingly awarded the contract. However, the CEGIS was appointed to provide monitoring for the first twenty months only, instead of for the full construction period (four years) of the project. The other twenty eight (28) months of project implementation was left largely unmonitored (Interview#1). According to the informants, the DOE was supposed to verify the supervision and monitoring records undertaken by the proponent. Initiative from the DOE, however, was not encouraging. Given the limited resources (staff and offices at field level) the DOE infrequently visited the project site.

After the construction was over, the project was operated and managed by the government (BWDB). To monitor the impacts of the project during its operation, the BWDB hired the Institute of Water Modelling (IWM). It had limited expertise of monitoring environmental and social impacts since its service was mainly related to river water management and modelling, and monitoring of engineering aspects (Interview#6). There is now no monitoring activity undertaken either by the IWM or any institution related to the social and environmental impacts of the project. As one interviewee points out:

‘The BWDB thinks that solving the drainage congestion is their only responsibility, not to protect the environment. That is why they (BWDB engineers) are interested in monitoring sedimentation of rivers only; they are not much interested about environmental (ecological) and social impacts of the project. The mindset of BWDB officials having little concern for the environmental impacts of the project is yet to be changed. This is a problem with BWDB. The environmental management plan

including monitoring was prepared at a cost of millions of dollars but the proponent is not paying much attention to follow the plan' (KJDRP- Hashem).

At present, the monitoring activity of the IWM is limited to hydrological and morphological changes, such as the depth of rivers, sedimentation rate, salinity, and the width of the rivers. A comprehensive monitoring effort, including environmental and ecological parameters, was required, not only on the river's morphological issues but also in the context of total basin (KJDRP-Mujibul). Moreover, IWM does not maintain a continuous monitoring and a recording system. For example, IWM did not set up any office in the project area for tracking impacts of the project. Officials of IWM come from the head office located in Dhaka, the capital city of Bangladesh to perform their monitoring task. So there was a lack of continuous and consistent monitoring by the IWM. The IWM comes after every four months to monitor data. There was a lack of close monitoring.

6.2.3.3 Community participation: Although local community members had an opportunity to participate in the identification of the project's impacts and in the design of mitigation measures, they had only limited opportunity to participate during the implementation of mitigation measures for the project. Discussions with the local community revealed that, since the BWDB did not implement the TBM option according to local community's expectations, the community and other stakeholders (NGOs and civil society) were not fully satisfied. As such, the local community was not interested in being involved further with the implementation of mitigation measures. The project proponent convinced a number of community people including local elites to support implementation of mitigation measures, but most of them had 'vested interests'.

According to the interviewees, the BWDB involved some local elites and one or two local NGOs. The proponent's intention was to show that it had involved community members in the implementation of mitigation measures and monitoring of implementation of mitigation measures and environmental impacts. However, many of those who became involved had vested interests, were not directly affected by the project, and therefore, had no legal basis and credibility to represent the voices of genuinely affected people irrespective of vulnerable groups (KJDRP-Mujibul).

Furthermore, interviewees stated that, during the study of EIA and the planning of the project, the donor agencies cordially supported community involvement and insisted the proponent involve the local community. However, there was no such support or pressure on the proponent from donor agencies to involve community people for the implementation of mitigation measures. The reason for such reluctance from the donor agencies however was unknown (Interview#1).

It was found that the attitude of the project proponent considerably affected community participation during the implementation of mitigation measures. For example, the proponent did not implement the TRM option as per the design and expectation of the local community. The proponent was sceptical about the value of knowledge and experience of the local community. Thus the proponent was not willing to accept this proposed environmentally sustainable concept. Rather, the proponent contained with its traditional engineering solution. According to one of the officials of CEGIS:

‘There was no initiative from the BWDB to implement TRM in other basin. They did not think about scaling up the TRM option. Rather it seemed that they wanted to hold

the implementation of this option. If the option were fully implemented, this would require heavy reliance on local people. The proponent did not expect it. If people were involved in the implementation and operation of the project it was assumed that their corruption would be exposed. Due to vested interest, the BWDB was reluctant to implement this option and hence to address the environmental and social impacts' (KJDRP-Mujibul).

In the case of KJDRP, although donors had much interest during the EIA study and the design of the project, interest and supervision of equal magnitude was lacking from the agencies during the implementation of mitigation measures. Highlighting this, one of the key interviewees said:

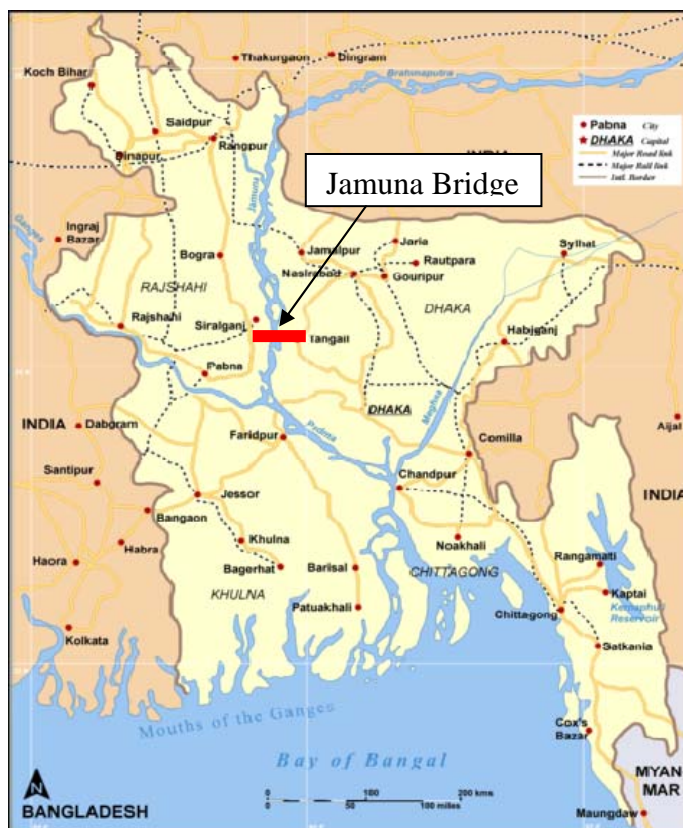
'...although there was pressure from donor agencies (ADB and World Bank) to incorporate the TBM in project design, there was hardly any supervision from donors part during the implementation of TBM option. For monitoring, donors' agencies had no pressure on proponent. If the donor agencies were active, the community would get the scope to force the proponent to manage the impacts of the project properly. Donors think that it is the responsibility of the government to look after the implementation of mitigation measures and ensure the protection of environmental impacts of a project' (KJDRP-Shafiq).

6.3 Case study II: Jamuna multipurpose bridge project (JMBP)

6.3.1 Project description

Jamuna Bridge, later renamed as Bangabandhu Bridge, built under the Jamuna multipurpose bridge project (JMBP), is the world's 11th longest (4.8 km) bridge. It crosses over the River Jamuna, one of the major rivers of the world. The river has its origin from Asam in India and flows over Bangladesh to the south, physically dividing Bangladesh into east and west parts. The Jamuna Bridge connects the eastern part with the north-western quadrant of Bangladesh. The location of the bridge is shown in Figure 6.6.

Figure 6.6: Location of Jamuna multipurpose bridge



Source: Wikimedia 2010

The Ministry of Communication implemented this large project with the financial and technical support of World Bank and Asian Development Bank during the period 1993-1998. The site is a densely populated rural area. The project area is plain agricultural land and the soil is very fertile. Most people (80%) rely on agriculture for their livelihood in Bangladesh (BBS 2005) and this is also true for the project area. Fishing is another important source of income for local people in the project area. Although the site does not have any kind of rich vegetation, except homestead forests (a combination of timber, fruits and fuel trees), the site is rich in many species of terrestrial and aquatic wildlife such as birds, mammals and reptiles. Importantly, Jamuna River in the project site area is a breeding ground of tortoises (*Batagur baska*) and ghorial (*Gavialis Gangeticus*) that are listed as threatened species according to the Red Book of International Union of Nature Conservation (IUCN) (IUCN 1991).

6.3.2 Environmental and social impact of JMBP

The proponent undertook an Environmental Impact Assessment (EIA) study in 1989 as a part of the Project Feasibility Study (JMBA 1989). Although there was no formal EIA legislation in Bangladesh till 1995, the EIA guidelines for Water Resource Sector was in place in addition to environmental laws (such as: Environmental Pollution Control ordinance 1977, the protection and regulations for conservation of fish 1985, Wildlife Conservation Act of 1973, and World Bank's Operative Directives of OD 4.01 and 4.30) for an EIA study of the project (JMBA 1989).

The EIA study expressed concerns about the hydrological and morphological change of the Jamuna River that could affect the bio-physical and social environment in the

project area. The EIA team warned particularly that the closure of the northern intake of the Dhaleswari River would have serious impacts on the surrounding natural resources and the society²³. The EIA report predicted that the volume of water of the river would be significantly reduced due to the closure of northern intake. The reduction of water would adversely affect agriculture, navigation, aquatic habitat and fish production. Furthermore, the construction of the bridge required a large amount of land to be acquired from the people living in the project site. A significant amount of land was also reclaimed from the Jamuna River at both ends of the bridge. The EIA team assessed that acquisition and reclamation of land in the project area would cause permanent loss of habitat for wildlife. The major significant physical, ecological and socio-economic effects are described in Table 6.4.

Table 6.4: Major social and environmental impacts of JMBP

	Important environmental issues	Potential significant impacts
1	Loss of agricultural production and aquatic habitat	<p>1. A total of 7000 hectares of land was acquired for the project to construct the bridge and resettle the displaced people. This will cause temporary and permanent loss of agricultural production during and after construction.</p> <p>2. The closure of northern intake of the Dhaleswari River will affect agricultural production in the area due to the reduction of flood water levels. The rate of the recharge of ground water may become lower and availability of water for irrigation during the dry season may be scarce.</p>

²³ **The closure of Dhaleswari River:** The closure of the northern intake channel of the Dhaleswari by the construction of embankments for river training is expected to have significant hydrological impacts on the upper Dhaleswari basin (700 square km). Normal flow of the river would be reduced during the monsoon and dry season. The most affected channels would include upper Dhaleswari and Pugli where annual discharge would be reduced from 40000 Mm³ to 15000 and 22000 to 7000 respectively. This would affect the navigation in the river, fish production, and ground water recharge.

Table 6.4 (Continued)

2	Loss of fish production	<p>1. The closure of the northern intake of Dhaleswari River will exert a major impact on fisheries as the water flow and amount of water will be reduced in the river by about 50%. The loss of fish production (492tons/year) will be reduced by about 25%.</p> <p>2. Around 5650 fisher folks will be directly affected of which about 1400 are full time professional fisher folk.</p>
3	Loss of wildlife	<p>1. The construction of Jamuna Multipurpose Bridge will intensify human activities on about 7000 ha of acquired land. As a result, the habitat of birds and other wildlife will be permanently lost. The bridge will cause change in the feeding and breeding ground of wildlife.</p> <p>2. Permanent loss of vegetation (homestead forests and bushes).</p>
4	Disruption of boat navigation	<p>1. Dhaleswari River is a major distributor channel of the Jamuna River which conveys about 15 percent of flow from the Jamuna towards the Meghna River. Due to the closure of the northern intake, the boats have to detour 60 km when using the southern intake channel and this will cause additional transport cost. A total 265 families who rely on boating for their livelihoods will be directly affected.</p>
5	Permanent displacement of affected people	<p>1. About 2166 households will be affected by projects. The people will lose their houses, agricultural land, shops and other sources of income.</p>
6	Disruption of water quality in the river during construction	<p>1. Water quality of Jamuna river in the project site will be disrupted due to heavy and long time dredging and other construction activities (piling, river training activity).</p>

Source: JMBA 1989

6.3.3 Proposed mitigation measures

To address the impacts identified by the EIA study in 1989, proponent devised a rapid Environmental Management Action Plan (EMAP) in 1993 and a detailed action plan of mitigation measures in 1995 (JMBA 1993, JMBA 1995) although the construction of the bridge began early in 1994, including land acquisition and development, and reclamation. Furthermore, the proponent prepared a Resettlement Action Plan (RAP) in

1994 (JMBA 1994). Table 6.5 presents proposed mitigation measures designed against each of the major significant impacts.

Table 6.5: Recommended mitigation measures for JMBP

Proposed major mitigation measures		Mitigation measures
1.	Protection of aquatic biodiversity and disruption of navigation	a. Provision of an alternative intake (channel) and enlargement of the southern intake (channel) to offset the loss due to the closure of northern intake of the Dhaleswari River.
2.	Increase of agricultural production to compensate for the loss of agricultural production	a. Training to the affected farmers due the closure of Dhaleswari River. b. Provision of credit facilities to farmers: affected farmers will be assisted with credit facilities
3.	Increase of fish production using ponds to offset the loss of fish production	a. Pond fish culture development using culture-able and derelict ponds in impact area for project affected persons (PAPs) and the construction of new ponds. Fish fry and fingerlings will be supplied. b. Provide alternative employment and skill development training on fish culture to PAPs in the project area.
4.	Protection of wildlife	a. Awareness program about the value of wildlife will be undertaken during the construction of the project. b. Plantation at both sides of approach roads to provide shelter for migratory birds and a breeding place for many resident birds. c. Establishment of a permanent sanctuary/protected area in one of the existing islands of the Jamuna River to compensate for the loss of wildlife species.
5.	Compensation for the disruption of boat navigation	a. Compensation and credit program for directly affected boatmen during the days they have no work. b. Provision of training to pursue alternative employment for boatmen who wish to take different means of livelihood or to supplement their reduced income.
6.	Plantation and social forestation(enhancement and compensation for clearance of homestead forests)	a. Plantation along both sides of approach roads (about 26 km) constructed for the bridge. b. Plantation of wood tress in the resettlement sites of 7.5 ha. c. Plantation in the open areas at both ends of the bridge.
7.	Resettlement and compensation for displaced people	a. Compensation for displaced people: cash compensation and displaced people will be resettled in two planned towns to be developed both east and west sides of the Jamuna River and near the ends of the bridge. b. Displaced people (2166 households) will be provided with income generation training to supplement their livelihoods they would lose due to the project.
8.	Maintenance of river water quality during construction	a. Dredging will be undertaken based on the seasonal variation

Sources: JMBA 1995.

6.3.4 Findings

6.3.4.1 Status of implemented mitigation measures

Protection of aquatic biodiversity: To protect the aquatic habitat from damage caused by the closure of the northern intake of the Dhaleswari River, the EIA report proposed to create an alternative channel and enlargement of the southern intake of the Dhaleswari River (JMBA 1995). However, the proponent did not create an alternative channel and enlarge of the southern intake. After the closure of the northern intake, a new off-take opened naturally nearby after three years from the start of the construction work of the project. The proponent assumed that the flow of water through the newly developed channel would offset the reduced flow of water due to the closure of the northern intake.

The Surface Water Modelling Centre (SWMC) of Bangladesh using the North Central Model (widely known as Mike II) analysed the impacts of the new channel in 2000 and concluded that the channel could send only one-third of the total water flows that had been reduced due to the closure of the northern intake (Imteaz & Hassan 2001). This shows that the creation of a new channel and the enlargement of the southern intake to protect the aquatic environment from loss were necessary. At present it is observed that about 60 km of upper Dhaleswari is apparently dead (Figure 6.7). This means that the habitat for fish and other aquatic species is reduced. The loss of available surface water for irrigation is also obvious (JMBP-Nishat). The proponent's attention was largely confined to the technical and engineering activities, such as river training and the

construction of the bridge. The protection of environmental damage did not get much of the attention of the project proponent (JMBP-Rejaur).

Figure 6.7: The fate of upper Dhaleshwari (northern intake) River in dry season



Source: Photo by the researcher from site visit

Increase fish production to offset the loss of fish stock: To offset the loss of fish production, the EIA report proposed to reform of the existing household ponds in the project areas and to excavate new ponds in the *khas* (government owned) land available in the project area. A training program on how to use new technologies in fish culture was proposed for the affected fishermen. The EIA report also proposed that four hatchery industries would be set up in the project area to meet the supply of fish fingerlings and fish fry for fish culture in the ponds. Moreover, the EIA report proposed for the creation of a revolving fund to run this program sustainably. An NGO called *Grameen Mathsya Foundation* was awarded the contract for implementing these mitigation actions.

Figure 6.8: Excavated ponds (as a mitigation measure) are dried up and abandoned



N.B. Shows the ponds excavated in the *khas* (government owned) land in the project area have dried up and affected community has lost their interest in being involved in fish culture. Currently most of these ponds are abandoned.

Source: Photo by the researcher from site visit

However, information from the informants and observation reveal that proponent partly implemented the mitigation plan. It was observed that the ponds created for fish production were not suitable for fish culture. Most of the ponds were dried up and were not re-excavated (Figure 6.8) leading to the abandonment of the ponds. Therefore, the actual production of fish was lower than the target and could not offset the loss of fish production caused by the construction of the bridge. One key informant from JMBA observes:

‘Initially, the implementation of the plan was satisfactory. However the full implementation of the plan was not possible due to various reasons such as lack of adequate training on fish culture, mobilization of community people and failure to understand sustainable use of ponds. Only 670 members out of 2500 were trained about the use of modern technology for fish production. Many fishermen did not attend the training and were reluctant to leave their traditional fishing in open water that they had been continuing for generation after generation. The Grameen Mathsyo Foundation could not mobilise the target group successfully to attend the training program. Many ponds became unsuitable for fish culture for all the year round, because they had almost dried up during the winter season’ (JMBP-Benu).

The plan was suitable in the local context as fish culture in the ponds had been popular and profitable in Bangladesh since the 1980s in order to meet the growing demand of fish consumption (Hussain 2010). Despite this, the mitigation actions remained unimplemented according to the expected scale and, consequently anticipated outcomes were not achieved. Some unforeseen difficulties and challenges hindered the implementation of the task. Effective coordination and cooperation between the implementing NGO and the project proponent was required to solve the unforeseen difficulties and challenges related to the implementation of the task (JMBP-Benu). However, such a coordination mechanism was non-existent according to most of the informants.

Another problem was related to the timely supply of basic inputs for fish production related to eggs, fish feeds, fish fingerlings and fish fries. Although the EIA report recommended establishing four hatchery industries to supply fish fingerlings, not a single industry was established by 2000. Before the construction of the project, Jamuna River was the source of fingerlings and fish fries. The construction of the project had a negative effect on the availability of fish fingerlings and fish fries in the locality. Therefore, setting up of hatcheries was an immediate need to meet the loss (JMBP-Nishat).

The loss of flood plain fishery due to the construction of the bridge affected the local fishers. There are dozens of fish species available in the floodplain waters of Bangladesh²⁴ (Hussain 2010). It was proposed that fish fingerlings and fish fry would be released in the floodplains yearly in addition to the ponds. However, the proponent inadequately undertaken this action. Therefore, it was not possible to compensate fully the reduction of fishermen's catches and earnings caused by the closure of the northern intake of Dhaleswari and alteration of the breeding ground of the fishery on the flood plain.

Protection of wildlife from loss: The proponent undertook a comprehensive inventory for wildlife in the project area before designing the mitigation measures. The study identified that 193 (one hundred and ninety three) species²⁵ of the wildlife were available in the project area. Among them, 10 (ten) species were listed under the categories of endangered and threatened species by the office of IUCN, Bangladesh (IUCN 1991). Moreover, the project site was a breeding ground of *gharial* (*Gavialis Gangeticus*) and tortoise. These species were also under the category of threatened species (Figure 6.9) according to the IUCN red book (IUCN 1991).

The proponent (JMBA) planned to undertake three mitigation actions in the project area to protect the wildlife from loss. These were: (1) establishment of sanctuaries in the *char* land (land that is raised as the result of accumulation of silt in rivers) near the

²⁴ There are about 795 species of fish and shrimp available in fresh and marine waters of Bangladesh. Fourteen exotic species have also been introduced in the country. Besides fish and prawns, there are 10 species of peal bearing bi-valves and 2254 species of edible tortoise and turtles (Mazid 2002).

²⁵ There were 9 species of mammals, 169 species of birds, 9 species of reptiles, 6 species of amphibians. Out of 169 species of birds, 50 species were winter migrants, 119 were resident species that were recorded in the Jamuna and Dhaleswari Rivers.

project site; (2) plantation of trees in the land acquired for the project at both sides of approach roads, as well as at both ends of the bridge; and, (3) a program to increase awareness about the value of wildlife among the local community and construction workers (JMBA 1995).

Site visits and information gathered from the relevant sources revealed that proponent did not create any sanctuary for the potentially affected wildlife species. According to one expert who was involved in the EIA team:

‘The proposed sanctuary was not established in the char-lands, although the creation of such an ecological reserve with rigorous and effective protective efforts was an appropriate option to compensate the loss of wildlife habitat. The proponent realised that the implementation of this mitigation measure would be more costly and time consuming than it was anticipated. Some of the land targeted for the establishment of sanctuary was under the occupation of local influential people. So it was not easy to acquire land from those influential people. Furthermore, there was also a lack of experts with adequate scientific knowledge and experience to create such a sanctuary in the context of Bangladesh’ (JMBP-Nishat).

Figure 6.9: *Gharial* (*Gavialis Gangeticus*): one of the threatened species in Bangladesh



Source: The Daily Star, January 2010

Apart from the mitigation measures stated earlier, the EIA report proposed for a mitigation action particularly for the threatened species (for example, *gharial* and tortoise). The project area was the breeding ground of the *gharial* and tortoise. These

two threatened species are notable assets of natural heritage and flagship species of the river ecosystem in Bangladesh. According to one key informant:

‘A special restoration action was necessary to compensate the loss of these species. Because of the high conservation significance of *gharial* and tortoise, a breeding Centre could be established. But no breeding Centre was established for such an ecologically important threatened species. Like many other developing countries the proponent failed to understand the value of wildlife to implement such an action’ (JMBP-Istiaq).

Furthermore, one of the mitigation actions to protect the wildlife was to make the local people and construction workers aware of the value of the wildlife. However, the proponent did not run effectively such an awareness program. Due to the lack of proper initiative to conduct an awareness program to protect the wildlife, hundreds of birds and reptiles were either killed by the workers and local people or died. This came about because of the loss of shelter and food during the development of the project site and construction of the bridge. A museum established on the project site exhibits a sample of this irreversible damage (Figure 6.10). One shortcoming was that the mitigation measures were designed at the time when the land was under the process of acquisition and reclamation. It was necessary to design the mitigation measures before these activities began.

Figure 6.10: A partial representation of the loss of wildlife during the construction of the project



Source: Photo by the researcher from site visit

Plantation of trees in the project area: Tree plantation along both sides of the approach roads as well as in the project area, was one of the important tasks in offsetting the loss of vegetation and homestead forests (a combination of wood, fruit and fuel) and the habitat of wildlife. One NGO, called Grameen Bank (GB), was awarded the plantation task for implementation. Project site visits revealed that two-thirds of the total land acquired for the project was left open at both ends of the bridge (Figure 6.11). According to one of the key informants:

‘If plantation of trees in this open space were implemented, this could compensate the loss of habitat to a large extent, if not fully in addition to meeting the demand of fuel wood for the local community. The Grameen Bank did not have adequate experience and expertise to perform this type of task. Selection of Grameen Bank was not perfect for this task. It has experience and expertise in microcredit program implementation and so suitable for poverty alleviation and not suitable for plantation or ecosystem management’ (JMBP-Nishat).

Figure 6.11: Land acquired for the project is left open and underutilised



Source: Photo by the researcher from site visit

Resettlement and restoration of livelihood for displaced people: To mitigate the social and economic impact on the displaced people, EIA report recommended compensation measures. Accordingly, the proponent implemented cash compensation and the resettlement programs for displaced people in two resettlement areas at both ends of the bridge. More than 2000 households were resettled in two areas at both ends of the bridge. The rest of the people who were not willing to be resettled in these two areas were paid in cash for the loss of their agricultural land, houses, shops, tea-stalls, and other sources of livelihoods.

Evaluation report (JMBA 2001), interview data and direct observation by the researcher indicate that the implementation of the Resettlement Action Plan (RAP) was largely satisfactory and, hence, the successful outcomes (Figure-12). Discussion with people resettled in the project area and direct observation support this claim. According to one key informant:

‘...initially the affected people were not happy to be resettled, arguing that the houses were smaller in size. They were also concerned that they might lose kinship and community bondage. However, at present, the people seem to be happy in both resettlement areas. The displaced people were provided with necessary facilities such as

schools, prayer places, electricity and medical services. These facilities were not available to them at the beginning of resettlement and so they were unhappy and doubtful about the project proponent's commitment. The resettled people could not enjoy these urban facilities in their original place of living in the past' (JMBP-Rejaur).

Many of the displaced people lost their sources of livelihood (such as agricultural land or shops) during the construction and implementation of the project. The proponent recruited them in different construction jobs depending on their skill levels. However, some of the affected people suffered from impoverishment as they had lost their jobs immediately after the completion of the construction of the project (JMBP-Rejaur). During their employment on the construction of the bridge, however, a good number of workers gained technical experience and became expert on some particular trades, such as dredging and welding. Many of these experienced and skilled people could even manage to get jobs overseas (for example, in the Middle East) after the construction of the bridge (JMBP-Nishat).

Figure 6.12: Resettlement areas for local community displaced by the project



Source: Photo by the researcher from project site visit

The presence of donor agencies and their guidance in resettlement were helpful in making the resettlement measure successful, except for the delay in payments in some cases (JMBP-Nishat). The timely implementation of compensation was delayed because of the deficiency in land tenure system, in addition to the complex payment system. The selection of the Bangladesh Rural Advancement Committee (BRAC), the biggest NGO in Bangladesh to implement the task, was found to be perfect. The NGO was experienced and committed to implementing the task properly and on time (JMBP-Hafiza).

Implementation of other major mitigation measures: The EIA report recommended for three other mitigation measures, namely the measure relating to the increase of agricultural production; the compensation measure for the loss of income for the disruption of boat navigation; and the maintenance of water quality during construction. It was proposed that training on agricultural crops suitable for the Dhaleswari River flood-plain would be provided to the affected farmers. Also, credit facilities and a supply of seeds for the affected farmers would be arranged. An NGO called *Dishari* was contracted by the proponent to implement the task, in collaboration with the Agricultural Extension Department (AED). According to the informants, few farmers were trained. Moreover, the farmers were not adequately compensated for the disruption and loss of agricultural production during the four year construction period of the bridge.

In order to compensate for the disruption of boat navigation, the EIA report proposed three actions: (1) cash compensation for the boatmen for the days they have no work; (2) the provision of training to pursue alternative employment for boatmen who wish to take up a different means of livelihood; and, (3) a credit program. However, the JMBA did not implement these actions on the grounds. The proponent argued that ‘the channel that opened up naturally shortly after the closure of northern intake of Dhalewsari would offset the loss or damage’ (JMBP-Istiaq). In practice, the channel opened up more than two years after the closure of the northern intake of the Dhaleswari River. In addition, the opening of the new intake could not compensate for the reduction of water that occurred as a result of the closure of the northern intake.

The above findings indicate that, out of eight (8) recommended mitigation measures the proponent completely implemented resettlement program only. Four (4) mitigation measures were partly implemented relating to fish production, the protection of wildlife, tree plantation, and water quality. The proponent did not implement at all the three (3) mitigation measures relating to the protection of aquatic biodiversity, navigation disruption, and the enhancement of agricultural production. Table 6.6 shows the status of mitigation measures implemented by the proponent of Jamuna Multipurpose Bridge project.

Table 6.6: Status of mitigation measures implemented for JMBP

	Proposed major mitigation measures	Implementation status			
		Fully	Partly	None	Unknown
1	Protection of the loss of aquatic habitat in the Dhaleswari River				
2	Increase of agricultural production to compensate for the loss				
3	Increase of fish production to offset the loss of fish production				
4	Protection of wildlife				
5	Compensation for disrupted boat navigation				
6	Social forestation and tree plantation in the project area				
7	Resettlement and compensation for displaced people from the project area				
8	Protection of water quality during bridge construction				

In general, the mitigation measures recommended by the EIA report were inadequately implemented in the case of JMBP. Despite the availability of funds supplied by the donors, mitigation measures, including the protection of wildlife, production of fish and plantation, and the conservation of aquatic habitat in Dhaleswari were not implemented successfully. One important reason is the attitude of the project proponent, as experienced by one of the informants:

‘The implementation of Environmental Management Plan was inadequate as the environmental component of the project was marginalised considerably by the JMBA due to their bureaucratic attitude, or lack of realization about the potential environmental cost on the society. The proponents in Bangladesh usually consider implementation of mitigation measures as a periphery work. The proponents’ concentration was to complete the construction of the bridge only, not to protect the environment. This was not because of lack of funds, the problem was the proponent.

The JMBA as the project proponent failed to realise the ultimate aim of EIA, that is, the minimisation of environmental impacts of the project through proper implementation of mitigation measures' (JMBP-Feroz).

6.3.4.2 Implementation of monitoring program: To implement the mitigation measures successfully, the EIA report proposed for a monitoring program. Accordingly, the proponent established an Environmental Unit (EU) in the project area for the implementation of mitigation measures and monitoring the progress of implementation activities. However, the proponent did not implement monitoring program as to its estimated full coverage and time. The monitoring program was limited only to the river morphology, such as the monitoring of sedimentation, flow of water, and the impact of water flow on the river training embankment around the bridge site. There was no systematic and/or comprehensive monitoring and recording of the mitigation measures relating to social and environmental impacts (JMBP-Najim). For example, no systematic monitoring relating to the protection of wildlife, the increase in agricultural production, the increase in fish production, and the protection of the aquatic habitat was done. Sites with important resources or threatened species required more attention and monitoring to confirm the adequate implementation of mitigation measures. The staff of the EU office could not provide any systematic data on these parameters when the researcher visited the project site.

According to the informants, a proper and systematic monitoring was necessary not only for the effective implementation of mitigation measures, but also to improve the whole EIA process for other similar projects. In practice, monitoring was not conducted with this substantive purpose. According to one interviewee:

‘If there were an effective monitoring program, we could quantify the impacts of the project during and after the construction of the project and, thereby, could evaluate the success of the mitigation measures. This could help us to take realistic mitigation measures for the proposed Padma Bridge to be constructed just 100 km downstream of the Jamuna River. We would not have speculated the impacts of the Padma Bridge and the design of mitigation hypothetically again. Thus the implementation of mitigation of effective monitoring program in the construction of Jamuna Bridge would help us a lot to improve the EIA for Padma Bridge’ (JMBP-Rejaur).

6.3.4.3 Community participation: From the beginning of the planning of the project, members in the local community did not have much awareness about the environmental impacts of the project. This is because the project proponent did not take any noticeable initiative to include the community members during the planning of the project. In fact, there was a lack of initiative by the proponent to include community members during the identification of impacts, designing of mitigation measures and their implementation. The lack of the proponent’s initiative meant that there was no community participation in any form. There was thus no, for example, any local committee during the planning and implementation of mitigation measures. As one of the interviewees pointed out:

‘There was no public participation in any form during the planning or implementation of mitigation measures, except the resettlement issue. If there were community participation during the implementation of monitoring and mitigation measures the environmental performance of the project could be more effective. Now we have learnt from this mistake and formed a local committee named, “Community Environmental Management Committee”, for monitoring and management of social and environmental impacts of Padma Bridge. It was necessary to form such a committee to successfully implement the environmental plan of Jamuna Bridge project (Jamuna Bridge)’ (Interviewee#16).

Some of the key informants also mentioned that this was the first EIA in the Road Communication Sector in Bangladesh for such a large project. So the project proponent (the Ministry of Communication) did not have much experience in the study of EIA and

in community participation (JMBP-Istiaq). A number of NGOs, such as Grameen Bank, BRAC and Grameen Mathsya Foundation, were involved in the implementation of mitigation measures. Usually NGOs in Bangladesh often represent the voice of rural community people. The above mentioned NGOs were hired and contracted by the project proponents to implement the mitigation measures. It was unlikely, therefore, that these NGOs, in the role of contractors, would represent the voice of the affected community.

6.4 Case study III: Meghnaghat power plant project (MPPP)

6.4.1 Project description: The project involved the construction and operation of a gas-fired, combined-cycled power plant in Southeast Dhaka, on the northern bank of Meghna River in Meghnaghat, Bangladesh. The site was selected for the construction of three power plants, phase by phase, to generate 2000 MW power. A 450 MW Combined Cycle Gas Turbine (CCGT) power station (Figure 6.13) was constructed in 2002 in phase-I by AES Meghnaghat Limited. The project was constructed at a cost of \$295 million and jointly funded by the ADB, WB and Bangladesh Government (GOB).

Figure 6.13: Meghnaghat power plant (back view)

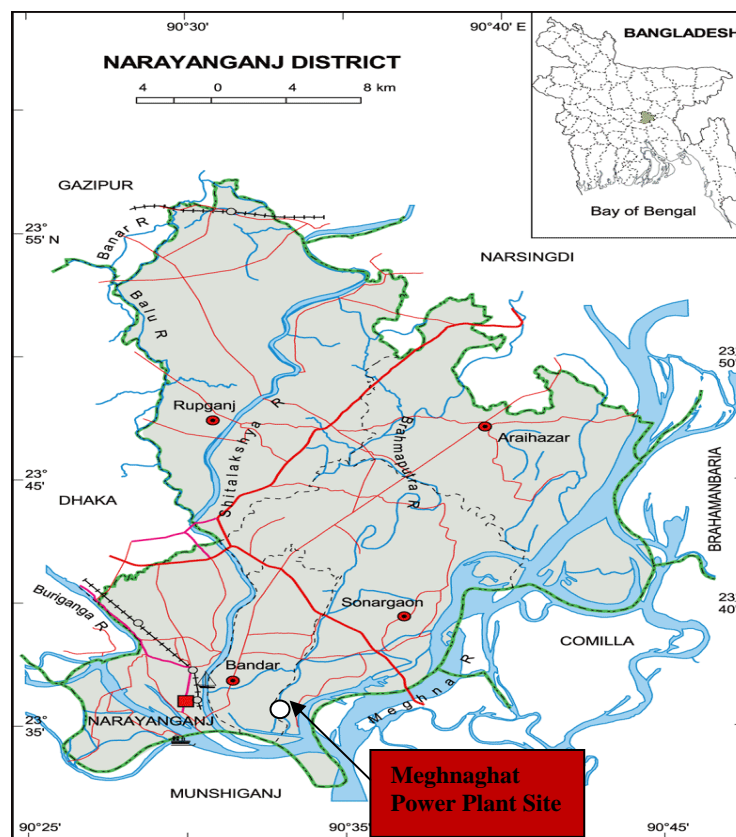


Source: Photo by the researcher from site visit

The site of the project is under the administrative jurisdiction of Sonargaon Upa-Zilla (an Upa-Zilla is the lowest tier of government administrative hierarchy in Bangladesh) of Narayanganj District on 230.77 acres of land (Figure 6.14). The project area is surrounded by low-lying fields of paddy and vegetable plots intermixed with clusters of houses. The land was used primarily for paddy cultivation during the dry season and as a fishery during the wet season. A wetland as a part of the low land is situated on the

northern side of the project. The wetland is rich in indigenous fish species and is a habitat for birds and other wildlife species. As a predominantly very fertile area, the project region has seasonal mixed crop vegetation and homestead based agro-forestry. So as to meet the existing and growing demand of electricity, the Bangladesh government²⁶ had invited private sectors to invest in electricity generation. The Meghnaghat Power Plant project (MPPP) is such a private sector initiative. The project was completed by 2002 and went into operation in 2003 with 22 years project life (AES International 2001). The project is currently owned and operated by Pendekar Energy Limited, a Malaysian company.

Figure 6.14: Location of Meghnaghat power plant project site



Source: AES international 2001

²⁶ The Bangladesh Power Development Board (BPDB), the state-owned organisation under the Ministry of Energy and Mineral Resources, is responsible for planning and generating power

6.4.2 Environmental and social impacts of MPPP

The construction activities of the project involved the acquisition of land and dredging in the Meghna River for the development of the project site. The EIA study identified that the acquisition of land for the project would cause the displacement of 17 (seventeen) households. Land development would also cause the displacement of wildlife, because vegetation in the project area, such as bushes, fuel-wood trees, and fruit-trees would be cut down and cleared. The EIA study also identified that the dredging activity would negatively affect water quality, the spawning of fish, and the income of fishermen. Moreover, the construction of the project would affect the nearby wetland, which is rich in indigenous fish, wildlife and migratory bird species.

The most notable concerns identified by the EIA team were the operation of the project for its 22 year life time and the impacts on the surrounding environment and society. The EIA team identified significant environmental and social impacts during the operation of the project relating to: water quality; air quality; solid and liquid waste; and, noise pollution. Table 6.7 shows the major environmental and social impacts of the project.

Table 6.7: Major environmental and social impacts of MPPP

	Important environmental issues	Potential significant impacts
1	Loss of terrestrial and aquatic habitat	a. Loss of habitat, both aquatic and terrestrial, during construction and operation of plant. Trees and vegetation will be lost in the project area due to the MPSA development including construction of access road. b. The project will affect the fish production and habitat of migratory birds in the nearby lowland (<i>beels</i>).
2	Noise pollution	During the construction and operation of the plant, noise will occur and disturb the community people living in the adjacent residential area and other sensitive receptors.
3	Air quality	The emission of NO _x and SO _x is inevitable due to the operation of the plant and generation of power. Release of NO _x and SO _x would significantly deteriorate the ambient air quality.
4	Cooling water discharge in the Meghna River water	There would be a significant impact of cooling water on aquatic environment in Meghna River if the waste water generated through the cooling process is not treated. Also there could be significant change in population of aquatic organisms and fish production.
5	Impact of solid waste	The plant will use 250 drums each of 45 gallons of lubricating and hydraulic oil each year. The solid waste is generated from the use of lubricating and hydraulic oil mainly in the form of sludge that contain heavy metals such as cadmium, chromium, lead, mercury, and nickel. Therefore, the solid waste will contaminate ground water, surface water and soil if not treated.
6	Involuntary resettlement	The project site consists of 230.77 acres of land of which 145.515 acres are owned by private landowners. More than 200 household will be affected due to the construction of the project either by the loss of agricultural or homestead land or both.
7	Disruption of water quality during construction	Water quality of the river would deteriorate during dredging in the Meghna River. Fish production and aquatic habitat will be heavily disrupted.

Source: AES International 2001

6.4.3 Proposed mitigation measures

To address the significant impacts outlined in the previous section, a set of mitigation measures was designed and proposed in the EIA report (Table 6.8). Accordingly, the proponent was committed to implement the mitigation measures in order to address the potential social and environmental impacts.

Table 6.8: Recommended mitigation measures for MPPP

	Proposed major mitigation measures	Mitigation actions
1	Protection of natural habitats from loss	Creation of green belt areas in the project site, including <i>beels</i> , to create a habitat for terrestrial and riparian wildlife species and improve aesthetics.
2	Noise pollution control	(a) Implement noise management measures. Follow WB, ADB and Bangladesh Government guidelines. (b) Muddy walls will be built around the site to protect neighbouring community from noise pollution.
3	Air quality management	(a) Use dry-low NO _x burner for the gas turbines. Monitoring to optimize operating load conditions to maximise efficiency and thus minimise emissions. Follow WB and Bangladesh emissions guidelines. (b) Use of natural gas and therefore no emission of SO ₂ . (c) Use of 60 metre high stack to optimise dispersion of exhaust gases.
4	Management of hot water discharge	(a) It was planned that the waste water, after the proper treatment, will be discharged into the Mengha River. Temperature of effluent discharge meets Bangladesh standards (10 ⁰ C) to control the effect on aquatic biota in the Meghna River. (b) An effluent disposal system will be installed to effectively treat and discharge of water.
5	Management of solid and liquid waste	(a) The sludge generated from stormwater system will be collected from the tank and will be analysed. (b) Toxicity of other solid waste generated from lubricants and hydraulic oil will be systematically collected and analysed by the proponent. (c) Then the waste will be delivered to the licensed contractors who have facilities to treat the waste and to recycle the treated waste for other purpose
6	Plantation of trees	Trees will be planted in the open space of the project area to compensate for the loss of vegetation and habitat for birds and other wildlife.

Table 6.8 (continued)

7	Implementation of involuntary resettlement	Assistance to households for loss of houses or land by way of cash compensation. Moreover, project-affected people will be recruited during the construction and operation of the project to offset their income loss.
8	Management of water quality	In the winter season and at low tide, dredging activity should be suspended for some time. Water quality will be closely monitored during dredging.

Source: AES International 2001

6.4.4 Findings

6.4.4.1 Status of implemented mitigation measures

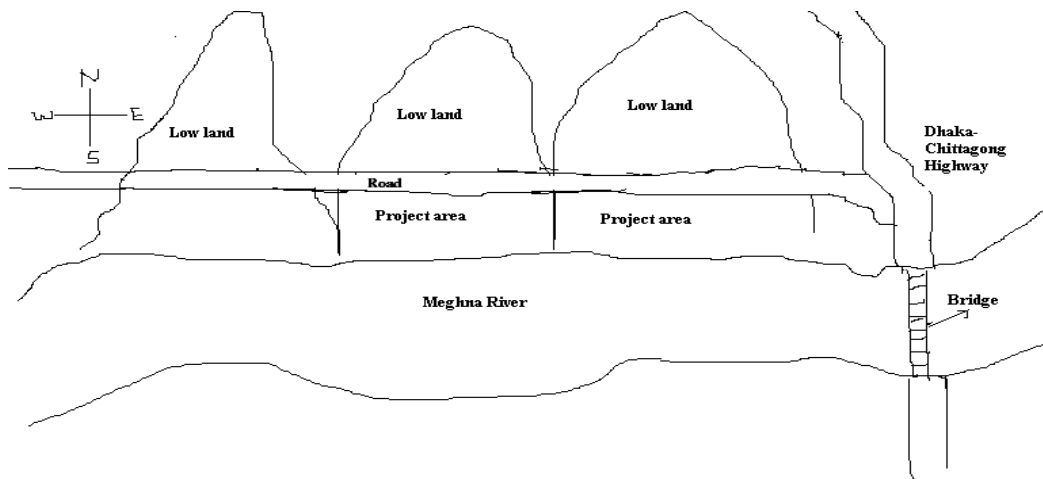
Protection of terrestrial and aquatic habitat from loss: The EIA team identified that the project would significantly affect the nearby wetland (*beel*) located to the north of the plant. Therefore, the EIA report recommended actions necessary to protect the terrestrial and aquatic habitat in the wetland and adjacent area, for example, releasing fish fingerlings and compensating affected fishermen. A program, including the creation of sanctuary in the North-western side of the wetland, was proposed to compensate for the loss of habitat and to protect the bird species from disturbance.

Interviews with key informants and observation reveal that, before the project was undertaken, the wetland was in a good condition. One issue was that water from the Meghna River could enter easily into the wetland during the monsoon and high tide time during the dry season. Fish used to come to this wetland from the adjacent Meghna River for breeding and spawning. The wetland was a source of income from fishing for many local people. There were fish of large size available in the wetland, such as *Ruhu*, *Katla*, *Boal*, and *Aire*. The project is located between the river and the

wetland (Figure 6.15). As a result, water cannot flow from the river into the wetland (*beel*) easily. This observation is evidenced in the following statement of an interviewer:

‘About one thirds of the *beel* (wetland) area is covered by the project. So the fish stock is now lower than before. It was in the 1990s when we saw the production of fish in this wetland, worth about ten to twelve hundred thousand BDT (about US\$50,000). Now this natural wetland cannot produce much fishes. We also see and understand that migratory birds still come but not many in number as it was in 1990s before the project. No initiative was taken either by the government or the proponent to maintain the characteristics of this area (wetland) except some compensation for the affected fishermen’ (MPPP-Mokhter).

Figure 6.15: The disruption of water-flow by the project



NB. The figure shows that freely flow of water from Meghna River to low land (wetland) is being interrupted because of construction of road.

Source: Drawn by the researcher from based on site visit

Control of noise pollution: The proponent has taken necessary actions to protect the neighbouring community from noise pollution. It was observed that proponent built earth embankments between the project site and the residential area of the neighbouring community. Furthermore, proponent planted trees to protect the neighbours from noise

pollution by the power plant (Figure 6.16). It was found from the site visit that the noise levels did not cross the limit set by the DOE and the World Bank.

Figure 6.16: Constructed earth embankments and planted trees



Source: Photos by the researcher from site visit

Air quality management: From observations and information gathered from key informants, it is evidenced that the proponent installed modern technology to manage air quality. The emission of SO_x and NO_x pollutants was a matter of concern. To control the emission of NO_x, the proponent installed dry- low-NO_x gas turbines. Two stacks of 60 meters in height each, were also built to emit the NO_x into the air (Figure 6.17) as recommended.

Figure 6.17: Installed stacks of 60 meters in height to minimise air pollution



Source: Photo by researcher from site visit

Management of hot water discharged into the Meghna River: According to the recommendation by the EIA report, the proponent planned to discharge the waste hot water into the Meghna River after its proper treatment. The temperature of the effluent discharge would meet Bangladesh standards (10^0C) in order to control the effect on aquatic biota in the Meghna River. With this in mind, proponent installed an effluent disposal system to treat the hot waste water generated from cooling process. The officials of the project office have mentioned that they used to release hot water into the Meghna River after the hot waste water is properly treated. However, it was not possible for the researcher to check the quality (such as toxicity and temperature) of the cooling water released into the river.

The local community in the project area said that they had little information about whether the proponent properly treated waste water before it was discharged into the river. The project proponent has always claimed that it discharges toxic hot water after

proper treatment. However, some past incidents demonstrate the futility of the proponent's claims. According to one of the members of affected community:

‘We see that fishermen hardly cast their nets for fishing within one square kilometre in the river surrounding the project. This indicates that fish cannot live in the river around the project site. We can recall that one boat capsized close to the point where hot water is discharged from the plant into the river of Meghna and one man was nearly killed due to the toxicity and high temperature of discharged water, we guess. A buffalo died after it had drunk water from the river where waste water is released from the plant. We guess that water was contaminated and that is why our domestic animals died. We requested the proponent to build fence around the point where cooling water is released, but the proponent did not listen to us’ (MPPP-Mokter).

Management of solid and liquid waste: The proponent installed an Effluent Treatment Plant (ETP), as observed by the researcher, to manage the solid and liquid waste generated from the plant. The proponent also established an Environmental Health and Safety Unit. This included a laboratory for conducting environmental management activities related to operating the ETP, and collecting, testing and disposing of solid and liquid waste. It was noted by way of observation that the project proponent had put due efforts into managing contaminated waste released by the power plant. The treated waste is collected and disposed of by the contractors as approved by the DOE.

Despite the satisfactory arrangement for the management of solid and liquid waste, the informants, however, expressed their concerns that the waste management activities undertaken by the proponent should be closely and regularly monitored and verified by the DOE. In the absence of the DOE's regular monitoring, the project proponent may not operate ETP at all and release toxic waste into the river water. This is a common phenomenon in Bangladesh where industries often tend to release toxic waste without treatment. An ETP is also a costly operation. Therefore, particularly during the rainy or

flood seasons, many industrial proponents tend to discharge the effluents directly into water without any treatment (Interview#6). The researcher observed that this concern was compounded among the community people surrounding the Meghnaghat Power plant project. The community people have no easy access to the project site to check the environmental management activity of the project proponent.

Plantation of trees in the project area: The EIA report recommended plantation of trees in the project area to compensate for the loss of vegetation that occurred during the construction of the project. However, during the site visit, the researcher observed that the plantation of trees covered only a little area of the project site. The vast amount of land of the project site has been left open with no plantation (Figure 6.18), or any useful activity, such as tourism. According to the informants, the plantation of wood, fuel and fruit trees in this open land could be a source of food and habitat for wildlife and fuel-wood for the affected local community. According to the officials of the project, since the site was developed by the government, it was the responsibility of the government to green this open area. The Department of Forest could be involved during the development of the site and it could thereby take the necessary action in creating vegetation. But this was not done in practice.

Figure 6.18: Acquired but unused land in the project area



Source: Photos by researcher from site visit

Involuntary resettlement and compensation for land acquisition: The government office acquired a total of 237.22 acres of land for the project. The EIA report recommended that the affected people should be paid in cash for the loss of their land. It also recommended that the local people should be recruited according to their skills during the implementation and operation of the project. Furthermore, the affected people should be given training on self-employment activities.

The compensation for the loss of land was paid on time to all affected individuals. However, the recipient, that is the land owners were not too happy since the payment was lower than the actual market price. The price of the land acquired was determined to be only BDT2000/decimal or US\$70/decimal, which was much lower than the actual market price at that time. It was not possible for the affected people to buy the same amount of land adjacent to the project area (MPPP-Raja) with the money with which they were paid.

The key informants said that the proponent imparted training to affected people on self-income generating activities. The proponent also offered jobs to the affected people during the construction of the project. The proponent employed about 100 people from the local community as temporary semi-skilled and un-skilled labourers.

After the completion of the project, however, many of the temporarily recruited project-affected people became unemployed again. The proponent recruited many semi-skilled and un-skilled people to operate the plant. However, discussion with the informants reveals that the proponent did not recruit anyone from the affected community.

According to one of the members of the Project Affect Peoples' (PAPs) committee:

‘The project is, at present, under operation, but the proponent has hardly recruited anyone for the affected people. There are some positions of various trades such as gardeners, sweepers, security guard and clerks. These positions require unskilled or semi-skilled people. But the proponent does not recruit anyone of us for these positions. It recruits staff from other places to serve their vested interest. Also, nepotism is there among the officers of the plant. The proponent can recruit at least some of us if not all affected people, but it does not’ (MPPP-Raja).

Management of river-water quality: During the construction of the plant, the proponent took appropriate measures into account to protect the water quality of the Meghna River. So, there was a possibility of surrounding river water being polluted because of dredging. There was close monitoring to observe the water quality, as the project officials said. More importantly, during the winter season (dry season) and low tide, dredging activity was suspended for some time. The Bangladesh Inland Water Authority (BIWTA) regularly supervised this activity. The River Meghna is a big river, so the quality of water in the river did not deteriorate during the construction of the project.

In summary, the findings analysed above show that among the eight (8) mitigation measures, the proponent implemented four (4) mitigation measures relating to noise pollution, air quality, solid waste and management of water quality during construction fully. The other four (4) mitigation measures relating to involuntary resettlement and compensation, the plantation of trees, the protection of river water quality from dredging, and the aquatic and terrestrial habitat were implemented partly. Table 6.9 shows the status of implementation of mitigation measures performed by the proponent

Table 6.9: Status of mitigation measures implemented for MPP

	Major mitigation measures	Implementation status			
		Fully	Partly	None	Unknown
1	Protection of aquatic and terrestrial habitat from loss				
2	Noise pollution control				
3	Air quality management				
4	Management of hot water discharged into the river				
5	Management of solid and liquid waste				
6	Plantation of trees in the project area				
7	Involuntary resettlement and compensation of land				
8	Management of water quality during construction				

6.4.4.2 Implementation of monitoring program: According to the project officials, the proponent conducts monitoring as recommended by the EIA report. The proponent submits a monitoring report to the DOE every month. The proponent also sends an environmental performance report to the ADB and the DOE annually. The proponent has also established an in-house laboratory to test the quality of cooling water and other solid and liquid waste. The proponent hired a third party, an organisation called Resource Control Centre (RCC) to monitor the aquatic condition of the Meghna River. Every two years, the RCC surveys quality of water in the Meghna River around the project site. Furthermore, air quality is monitored twice a year by air quality experts.

Although the proponent has established an in-house monitoring program, concerns from key informants (e.g. local community) suggest that this cannot guarantee that the proponent is adequately performing monitoring program. This is because proponents often may manipulate their monitoring data if the activity is not frequently checked by the DOE. In practice, industrial proponents often send samples of water quality, for example, to the DOE that are often found to have been manipulated and misleading (Interview#6). Therefore, the DOE staff should regularly visit the project site and verify the proponent's mitigation and management activities on the ground instead of performing a 'desktop exercise' as they often do (MPPP-Mahmud).

Another technique of monitoring applied by the proponent of Meghnghat Power Plant project was the systematic recording of complaints submitted by the local community about the environmental pollution. However, there was no such systematic recording system either in the project office or elsewhere, such as in local government offices.

Additionally, the environmental court or environmental office is not available in district level, let alone Upa-Zilla (sub-district) level. So there were hardly any complains made by the local people. Also, in general, local people in Bangladesh do not make any complaints until they are directly affected by any project. Often they do not make complaints about the pollution for fear of harassment by the influential project proponents (Interview#13).

6.4.4.3 Community participation: During the EIA, the community was involved in the form of consultation through formal and informal meetings. A socio-economic survey was conducted amongst the households of three local villages (Islampur, Ganga Nagar and Dhadghata villages) to collect socioeconomic data. This survey gave the local community an opportunity to learn about the project and its activities that may affect the surrounding environment and society. The draft EIA report was also placed in the Local Council (lowest tier of local government structure) where those people affected by the project and other stakeholders had the opportunity to make comments on the potential impacts of the project.

While the proponent involved the concerned community during the EIA study and the development of the EIA report, the involvement of community in environmental management during the operation of the project was limited. The proponent formed a committee consisting of people affected by the project called Project Affected Persons' (PAPs) committee. Therefore, local people had an opportunity to meet and negotiate with the project proponent by means of this committee. As the representative body of affected local people, this PAPs committee sits with the proponent every four months.

The proponent informs the members of PAPs Committee of mitigation and management of impacts of the plant's operation (MPPP-Mahmud).

However, information from the site visit and discussion with the community people reveal that members of PAPs committee take part in the meeting merely as listeners without having any scope to put their concerns or verify the proponent's claims. As stated by one of the members of the PAPs committee:

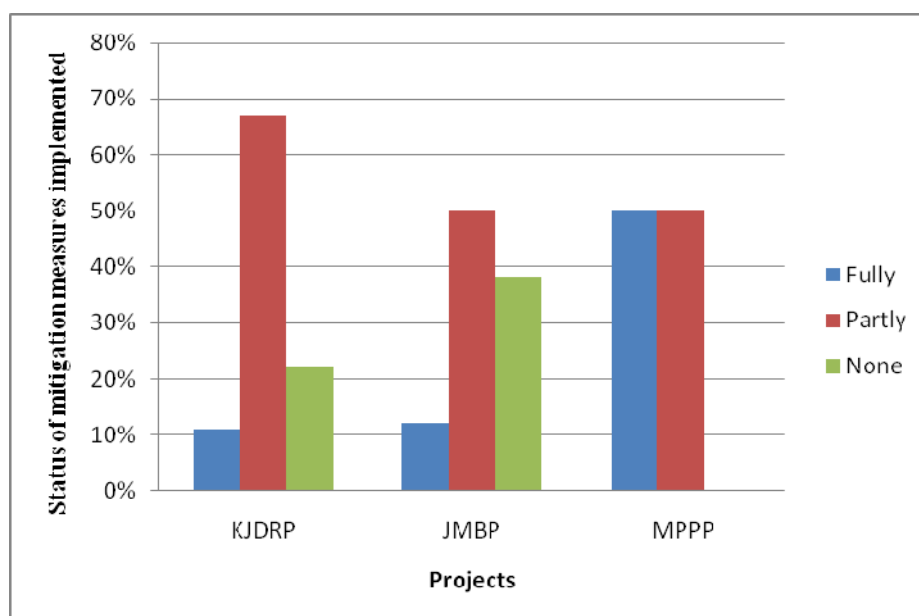
‘Often we do not understand the technical issues and jargons they use when they talk with us. We do not see any documents or records on environmental management activity or monitoring results when we sit with them in meetings. They always claim that they are managing the environment properly. We have to rely on their words and we trust what they say. This is eyewash. We do not know whether the toxic waste is treated properly or not. The DOE officials can fill this gap as they have supervising authority and expertise. However, they (DOE officials) do not come to verify what is happening in the field. Also, the proponent sends monitoring reports to DOE, but neither the proponent nor the DOE's officials share the reports with us. Therefore, we are always in the dark’ (MPPP- Mokter).

6.5 EIA practice at post-EIS stage: overall environmental management performance of the three projects

6.5.1 Implementation of mitigation measures of three projects: The status of the implementation of the major mitigation measures adopted in the three projects is shown in Figure 6.19. Among the 8 (eight) major mitigation measures of JMBP, 12% (one) measures were fully implemented, 50% (four) measures were partially implemented, and 38% (three) were not implemented at all. In the case of KJDRP, out of 9 (nine) mitigation measures, 11% (one) measure was fully implemented, while 67% (six) measures were partly implemented. The remaining 22% (two) measures were not implemented at all. In the case of MPPP, among 8 (eight) mitigation measures, 50% (four) mitigation measures were fully implemented, and 50% (four) mitigation measures

were partly implemented. Overall, the findings show that no project achieved its environmental management targets in terms of the implementation of recommended mitigation measures. Due to the inadequate implementation of mitigation measures, as revealed in the case of three projects, the significance and effectiveness of EIA as a flagship of environmental management tool largely remained under-appreciated.

Figure 6.19: The status of implemented mitigation measures of the three projects



6.5.2 The role of DOE

This study shows that, during the implementation of the mitigation measures, the DOE had exercised inadequate supervision to track the implementation of mitigation measures and management of environmental impacts. Although the DOE is empowered to take strong punitive actions against the proponents for inadequate implementation of mitigation measures, the DOE did not take any stern action. This includes no action in lodging a case against the proponents of KJDRP or JMBP, except serving show cause notices. This is because, according to the informants, there is an unwritten rule in Bangladesh that one government agency cannot sue another government agency (Interview#13). The informants also expressed their concerns that this immunity may

lead a public proponent to evade the project approval conditions by failing to adequately implement the mitigation measures.

On the other hand, DOE officials reveal that, given the limited financial and technical resources, such as budget, staff, expertise and laboratory equipment, the DOE could not adequately supervise the implementation of mitigation measures. However, according to the informants, the lack of sincerity among the DOE officials in regularly visiting the project sites contributed more to the poor supervision than the scarcity of resources. Officials become proactive in supervising mitigation measures only when environmental pollution is published in the print or electronic media. 'If DOE cannot supervise a project, for example, an industrial project once in a month, it can supervise at least once in every three or four months, I believe' (Interview#6).

6.6 Chapter summary

This chapter presents findings on the effective EIA practice at the post-EIS stage of EIA system in Bangladesh. The main finding is that EIA practice at the post-EIS stage of EIA process in Bangladesh is inadequate. Results show that mitigation measures were not adequately implemented in the case of three projects analysed in this chapter. Furthermore, community participation and monitoring activities required for effective implementation of mitigation measures were found to be inadequate. The findings and specific discussions of this chapter, along with the previous two chapters (Chapters 4 and 5) reveal the status of the EIA system in Bangladesh. The next chapter (Chapter-7) pursues a general discussion on an effective EIA system in Bangladesh in the light of these chapters.

Chapter-7

General discussions

7.1 Introduction

This chapter is a synthesis of findings presented in the preceding three chapters (Chapters 4, 5 and 6) and is divided into six sections. Section 6.2 discusses the current institutional arrangements of EIAs in Bangladesh and the possible causes of current deficiencies in institutional arrangements. Section 6.3 briefly discusses the quality of EISs and the factors influencing the quality of EISs in Bangladesh. The practice of EIAs at the post-EIS stage in terms of the implementation of mitigation measures and monitoring activity are discussed in Section 6.4. Possible reasons for the inadequate implementation of mitigation measures are analysed. Section 6.5 focuses on the overall status of the EIA system in Bangladesh. Finally, Section 6.6 presents a proposed effective EIA system in Bangladesh that has emerged from this study. This is followed by a chapter summary.

7.2 Institutional arrangements for the EIA system in Bangladesh

The findings in Chapter 4 show that significant efforts have been made throughout the last two decades to establish a viable institutional set-up for EIA practice in Bangladesh. In the context of growing environmental problems, new laws and subsequent supporting legal documents were required. In response to this requirement, old legislation (Environmental Protection Ordinance of 1977) was repealed and new legislation (Environmental Conservation Act of 1995 and Environmental Conservation Rules of

1997) was enacted with a greater scope for environmental management. This new legislation provides the legal foundation for the EIA system in Bangladesh.

As part of the increased emphasis on environmental protection, there has also been an initiative to reorganise the administrative arrangements for the application of EIAs. The pollution control cell created under the Environmental Protection Ordinance in 1977 has now grown into the Department of Environment (DOE). Now there is a separate Ministry of Environment and Forest (MOEF) responsible for making environmental policies and legislations. Within the MOEF, the DOE carries out its responsibilities to implement EIAs. In addition, the establishment of an environmental court in 2000 is another initiative of the government to make the EIA system effective. These institutional arrangements represent a key feature of an effective EIA system as proposed by authors, such as Abracosa and Ortolano (1987), Ortolano, Jenkins and Abracosa (1987), and Ortolano (1993).

However, the presence of mere legal provisions and organisations is not enough to have an effective EIA system. The legal provisions need to be clearly articulated with the adequate delineation of EIA requirements. The legislation of EIAs needs to be comprehensive and enforceable in practice (Abaza, Bisset & Sadler 2004, Nardini, Blanco & Senior 1997). The EIA legislation needs to be comprehensive so that proponents are bound to implement the requirements. The provisions of EIA requirements should be clearly stated by the legislation so that proponents easily understand the EIA process and implement it effectively.

The findings in Chapter 4 show that the provisions of the EIA requirements are not comprehensively and clearly stated in current legislation (ECA of 1995 and ECR of 1997). For example, while the EIA legislation covers the process of the submission of EISs and the issuance of ECCs, it does not clearly mention all of the key procedural requirements of the EIA process. The current EIA legislation does not explicitly prescribe all generic stages of the EIA process such as scoping, analysis of alternatives and monitoring. Also, the review process of EISs and the provision of EIAs for modified or extended projects are not detailed adequately by the legislation. Although the legislation does not need to set down each of the procedural steps in detail, it should define and cover each of the stages of the EIA process. Due to the lack of comprehensive rules for EIA requirements, proponents may avoid some requirements during the implementation of EIAs.

Furthermore, there is a lack of clarity in the EIA requirements legislated by the Environmental Conservation Act of 1995 and Environmental Conservation Rules of 1997. Some provisions of the EIA requirements prescribed by the ECA and ECR are unclear and, hence, not enforceable in practice. Examples of this include the validity of Environmental Clearance Certificates, the provision of site clearances and the fact that the undertaking of court action against proponents as proscribed by the legislation are ambiguous in wording and incomplete and, therefore, difficult to implement in practice (details in Chapter 4). This may create confusion and uncertainty amongst the proponents in effectively applying EIAs in Bangladesh.

The lack of clarity and comprehensiveness in the EIA legislation (ECR) can be attributed to the fact that the EIA is relatively new in Bangladesh. In addition, after the introduction of EIA laws in 1995, there were no comprehensive reviews by the government or academics and there were no major amendments or modifications made to the laws. It is, therefore, not surprising that some deficiencies in terms of comprehensiveness and clarity of provisions exist in current EIA legislations. In developing countries, for example, China and Brazil, the EIA legislation also had deficiencies when first introduced. The legislation in these countries was amended after a decade to make the EIA system more effective (Glasson & Salvador 2000, Wang, Morgan & Cashmore 2003). In countries with advanced EIA systems such as the Netherlands, other countries in Europe and in Australia there is a provision for regularly reviewing the system regularly and documenting the experiences to improve EIA practice (Commonwealth of Australia 2009, European Commission 2009, Netherlands Commission for EIA 1994).

While the DOE is legally empowered by the legislation to enforce the EIA, the DOE lacks an adequate budget and staff. Moreover, the lack of stable leadership and the absence of a decentralised administration are major weaknesses of the DOE. As a relatively new organisation the DOE's position in the government bureaucratic hierarchy is not well established as yet. Hence the DOE has limited influence over politically influential proponents. These weaknesses limit the DOE's enforcement capacity and the scope of the delivery of intended services. Previous studies have found that the relatively weak position in the government bureaucratic hierarchy and the lack of adequate resources often limit the environmental agency's control over the

proponents. The environmental agencies cannot adequately oversee the activities of proponents and often fail to apply appropriate effort in order to force the proponents to comply with EIA rules and regulations (Briffett 1999, Doberstein 2002, Ebisemiju 1993, Lim 1985, and Ross 1994).

The reason for the DOE being under-resourced in terms of its budget and manpower can be attributed partly to the current socio-economic, political and bureaucratic context of Bangladesh. It is widely recognised that, due to the high standard of living and education in the industrialised nations, there is a great deal of support for environmental protection from the general public, which has resulted from a high degree of awareness of environmental matters. On the other hand, in developing countries, the standard of living and education is still very low and environmental issues are accorded a much lower priority. Therefore, the approach to environmental protection in developing countries is top-down and success for those administrative arrangements that have adequate resources for implementing EIAs often lies in convincing policy-makers (particularly politicians) of the importance of environmental protection.

In Bangladesh, the DOE depends on the Ministry of Finance for its budget. There is a conflict of interest between the two bodies. Ideally, as the custodian of environmental management, the DOE advocates for sustainable development where economic growth is encouraged, but this should not be at the cost to the environment. On the other hand, the Ministry of Finance, as in many other developing countries, tends to rate the attractive figure of economic growth more highly, even though it might be at the cost of the environment. The people of Bangladesh do not have adequate awareness of

environmental issues, and, therefore, pressure from the affected people is often not significant. Thus, the current socio-economic and political context in Bangladesh puts constraints on the capacity of the DOE to implement EIAs effectively.

The weaknesses of institutional arrangements (legal and administrative) identified in this study are, however, not unique to Bangladesh. Previous studies in developing countries (ADB 2007, Ahmad & Wood 2002, Appiah-Opoku 2001, Briffett 1999, Doberstein 2002, Glasson & Salvador 2000, Hollick 1998, Kakonge & Imvebore 1993, Lee & George 2000, Lim 1985, Paliwal 2006, Ramjeawon & Beedassy 2004, Ross 1994, Sadler 1996, Sankoh 1996, Tongcumpou & Harvey 1994, Turnbull 2003, Wang, Morgan & Cashmore 2003, Zeremariam & Quinn 2007) have similar findings. The extent and nature of the weaknesses of institutional arrangements of the EIA system in these developing countries, however, may vary from the EIA system in Bangladesh.

This study suggests that an EIA system with comprehensive legislative provisions for EIA application is required in Bangladesh. Some provisions of EIA requirements (for example, provisions regarding the review of EISs, an EIA of the extension of an old project, and the stages of the EIA process) need to be incorporated. Also, some existing provisions of EIA requirements (for example, the validity of ECCs, the provision of site clearances and the community's right to go directly to court) need to be amended to address ambiguity. A complete form of legislation, with clear provisions for EIA requirements, is necessary in Bangladesh. In many developing countries, for example the Philippines (ADB 2007), Thailand (Memon 2000), Brazil (Glasson & Salvador 2000), and China (Wang, Morgan & Cashmore 2003) have amended their EIA

legislation such that it contains comprehensive provisions for the requirements and broader scope of EIA applications.

The findings of this study (Chapter 4) also suggest that, in order to make the EIA system effective, the administrative set up in Bangladesh must be sufficiently capable in forcing and guiding project proponents to comply with EIA requirements. On the one hand, this requires the DOE to have adequate resources (budget and staff) and expertise to perform the intended tasks. On the other hand, the DOE also requires a stable leadership with an infrequent turnover of top officials and a decentralisation of its function at local level (District and Sub-district levels) through the setup of offices. It is a positive sign that, recently, the government has decided to increase the manpower of the DOE from 267 to 735 and it is hoped that the DOE will be able to cover the current shortage of manpower. However, the decentralization of the DOE's function by setting up offices at district and Upa-Zilla levels is still far from a reality.

7.3 The Quality of EISs in Bangladesh

The quality of EISs reflects the effectiveness of the EIA process in practice. The findings in Chapter 5 show that the quality of EISs in Bangladesh in general can be classified as being merely satisfactory, while a significant number (34%) of them are unsatisfactory. Thus, the findings recognise that the quality of EISs varies in Bangladesh (some EISs are good and some EISs are not satisfactory). This also suggests that some tasks (criteria) need to be performed well as many have been found to be poorly performed. These findings are broadly in line with previous studies conducted in developing countries and elsewhere (for example Badr, Cashmore & Cobb 2004, Badr,

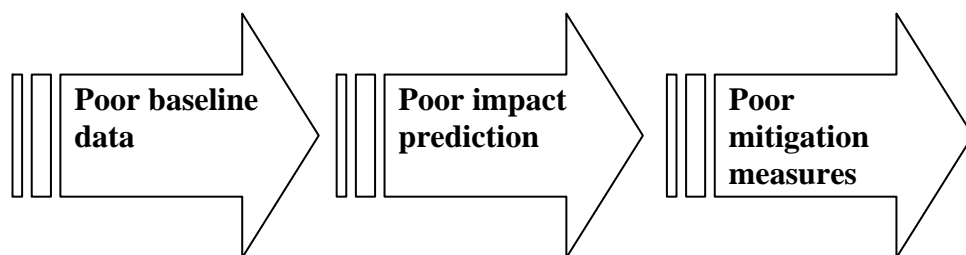
Zahran & Cashmore 2011, Barker & Wood 1999, Cashmore, Christophilopoulos & Cobb 2002, Glasson et al. 1997, Jalava et al. 2010, Sandham & Pretorius 2008, and Tang, Bright & Brody 2008. For example, Barker & Wood (1999) found 50% of the reviewed EISs to be unsatisfactory and Badr, Cashmore and Cobb (2004) found 32% of the reviewed EISs to be unsatisfactory.

The quality of an EIS is found to be deficient when important criteria (tasks) in the EIA reports are not well addressed or are omitted. This study shows in particular that the tasks such as baseline data, impact prediction and assessment, the design of mitigation measures, and alternative analysis and monitoring are often poorly performed. These findings on poor performance concur with the findings of previous studies (for example, Fuller 1999, Glasson et al. 1997, Sadler 1996, Sandham & Pretorius 2008). Even in a mature EIA system, the quality of EISs suffers from inadequacies, especially with regard to impact prediction, the determination of significant impacts, and the design of mitigation measures (Fuller 1999, Sadler 1996). The poor performance of these fundamental and quality criteria also suggests that an EIA's performance has limitations as an applied science in Bangladesh. The implication of this weakness is that there is the potential risk of poor decision making in the planning and approval of the project.

The reviewed EISs include lack of adequate, systematic and accurate baseline data, poor impact prediction and poor evaluation of significant impacts. This situation indicates that the scientific aspects of EIAs are poorly addressed in Bangladesh. During the review of the quality of EIS, it was observed that where the EISs' baseline data was poorly presented, subsequent actions relating to the prediction of impacts and mitigation

measures were also poor. This suggests a proposition about the relationship between baseline data, impact prediction and mitigation measures (Figure 7.1). This also demonstrates that capturing relevant, adequate and good quality scientific information and their presentation is a challenge faced by EIA professionals (Alton & Underwood 2003).

Figure 7.1: The relationship between baseline data, impact prediction and mitigation measures



Source: Developed by the researcher

The deficiency in the quality of information that is contained in EISs in Bangladesh is attributable to a number of immediate factors. These factors include, inadequate time given for EIA study, the commercial interest of consultants and proponents, a lack of EIA experts, defective service procurement for public projects, a lack of funds, weak TORs, and weak EIA teams. These findings concur with the studies of Hicki and Wade (1998), Lohani et al. (1997), Pinho, Maia and Monterroso (2007), Modak and Biswas (2000), Morrison-Saunders, Annandale and Cappelluti (2001), Simpson (2001), and Wood (2003). For example, Morrison-Saunders, Annandale and Cappelluti (2001) underscore that time and financial resources are among the main driving forces of EIS quality. Authors such as Modak and Biswas (1999), and Lohani et al. (1997) hold the view that a clear and complete TOR is an important factor in a good quality EIS.

In addition to the above factors, the deficiency in comprehensive legal requirements relating to EIS preparation and a lack of sector-specific and technical guidelines may influence the quality of EISs. As mentioned earlier (in Chapter 4) there are only four sectoral EIA guidelines available. In contrast, there is a wide array of guidance on procedure and practice in developed countries (Glasson 1999b). There are no technical guidelines for baseline data collection and for prediction and assessment of impacts using suitable techniques. In the absence of adequate sector specific and technical guidelines, EIA practitioners often face difficulties in determining the right type of data required, the application of appropriate models, and the techniques for predicting and evaluating impacts (Interview#6).

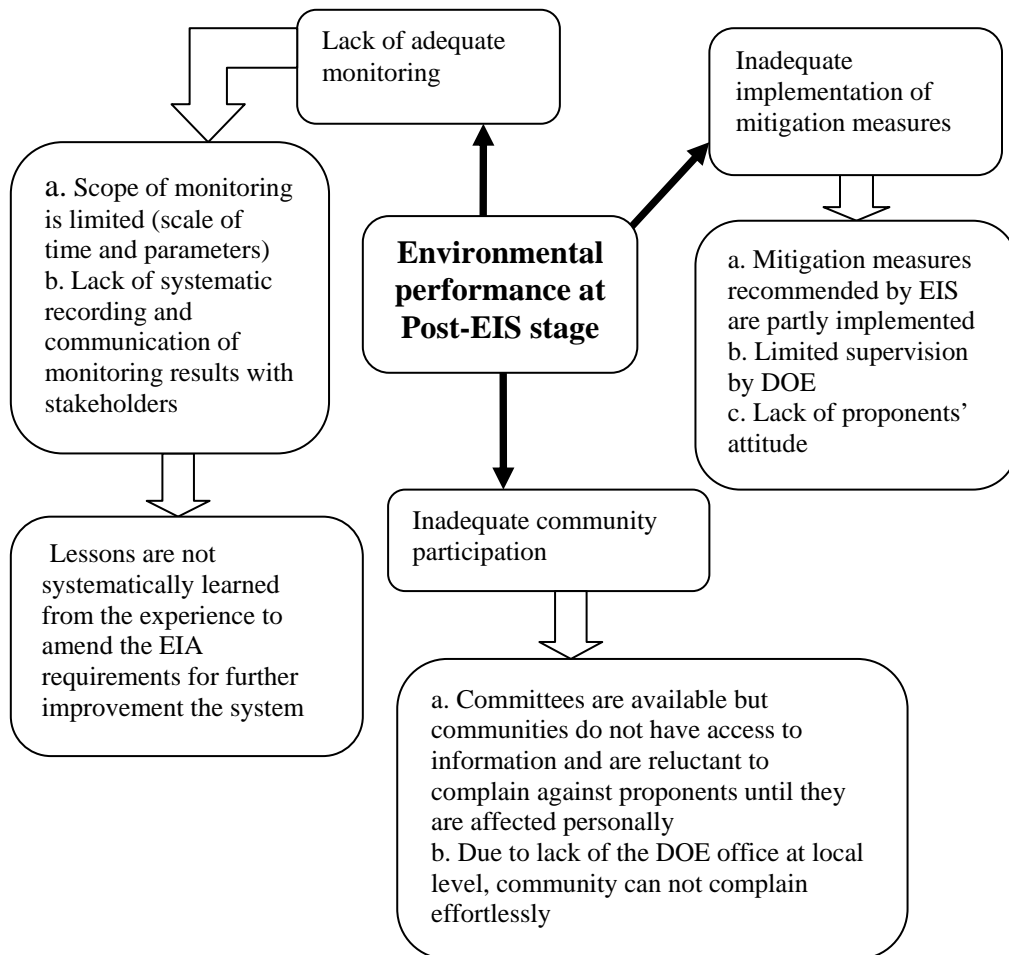
This study suggests that the provisions relating to the code of conduct and accreditation system for qualified EIA consultants are required to improve the quality of EISs in Bangladesh (Momtaz 2002). At present, EIA consultants are paid by the proponents and, therefore, consultants often tend to prepare the EIS according to the will and objective of the proponents. The proponents' objective is often to prepare the EIS to obtain environmental clearance from the DOE rather than to prevent the environmental impacts of the project. Therefore, EISs may be deficient in the quality of information and obstructive for making informed decision. The regulatory control of consultants through the introduction of a code of conduct is, therefore, necessary to force EIA consultants to prepare EISs with minimum bias and, thus, improve the practice.

7.4 EIA practice at post-EIS stage: implementation of mitigation measures

The key features of an effective EIA system include the adequate implementation of mitigation measures and other activities, such as monitoring at the post-EIS stage of the EIA process. However, in the case of the three projects (details in Chapter 6) the findings show that there is a clear gap between the mitigation measures recommended by the EIA reports and the mitigation measures actually implemented by the proponents. In general, mitigation measures have been only partly implemented in each of the three projects. Also, there has been inadequate community participation and monitoring (Figure 7.2). Since the mitigation measures have been only partly implemented, it can be presumed that the targets for environmental protection of the projects were not fully achieved.

A number of similar studies conducted in the past, for example, that of the ADB (1998), Marshall (2001), Morrison-Saunders and Bailey (1999), Morrison-Saunders, Baker and Arts (2003), Muretta and Price (1982), Ortolano and May (2004), and Wilson (1998) also have demonstrated that the implementation of mitigation measures and other activities are poorly performed at the post-EIS stage in the EIA process.

Figure 7.2: Environmental management performance of the three projects at post-EIS stage of EIA process



Source: Developed by the researcher

Although there has been an inadequate implementation of mitigation measures in the case of the three projects, the findings in Chapter 6 show that the performance of the MPP project is relatively better than the other two projects (KJDRP and JMBP). The reasons for the better performance of MPP may be that the private proponent was

careful about its corporate image as an international company. As a part of this, a laboratory was established in the project office and the project office appointed a fulltime environmental health and safety officer to look after environmental issues. Also, the proponent sends environmental management reports voluntarily to the DOE and sits with local community people once every two months. On the other hand, in the cases of the KJDRP and JMBP, the proponents were government (public) agencies and were therefore reluctant to implement the mitigation measures with due attention. The primary reason for this reluctance could be the unwritten rule that, as a government agency, the DOE cannot sue another government agency.

In the case of the three projects, findings also reveal that active participation by the community people was not noticeable during the implementation of mitigation measures. In the case of the KJDRP, the community had an active role as well as the support of donor agencies in designing the project. However, the community's role was limited during the implementation of the project as its member were not happy when they saw that the proponent (BWDB) was reluctant to implement the project according to their proposed design. In the case of JMBP, community had very limited active participation during the implementation of mitigation measures (except the resettlement action). In the case of the MPPP, community participation has been in place in the form of a committee. This shows that the proponent is accountable to the neighbouring community, but the findings also show that proponent only informs them about their own activities rather than encouraging active participation.

The findings also reveal that mitigation measures could be implemented more effectively by actively involving community people given their special environmental knowledge accumulated through many generations of experience. While experience shows that members of the communities may not have a good understanding of bio-physical impacts, in some cases, they have a better understanding of the socioeconomic impacts of projects and the ways to mitigate them than the EIA experts (Hunsberger, Gibson & Winner 2005, Momtaz 2006, Morrison-Saunders & Arts 2005). Therefore, both the proponents and regulators in Bangladesh need to realise the potential strengths of members of the community that may be useful in effectively implementing mitigation measures.

The poor implementation of mitigation measures in the case of the three projects can be attributable to a number of factors. In the case of all three projects, these factors include the attitude of the proponents, the lack of coordination between actors involved in the implementation of mitigation measures, limited supervision by the DOE, and limited support from the donor agencies. These factors were behind the poor implementation of mitigation measures.

In Bangladesh in general, the proponents perceive that the purpose of an EIA is just to prepare reports and gain an ECC from the DOE. This short-term objective may divert proponents' attention away from the effective implementation and management of mitigation measures. This finding confirms the views of other studies, for example by Bailey (1997), Dipper, Jones and Wood (1998), Sadler (1988), Shepherd (1998), and Tomlinson and Atkinson (1987). The lack of attention by the proponents in the post-EIS

stage of EIA (as related to the implementation and management of mitigation measures) is a major constraint in the advancement of EIA practice in Bangladesh.

Similarly, donors' support might contribute in many ways to the adequate implementation of mitigation measures. However, there is a lack of support from donor agencies at the post-EIS stage of EIAs. Like many other countries, proponents prepare Project Completion Reports (PCRs) and send those to the donor agencies. However, these reports reflect in only bare detail whether mitigation measures were implemented adequately. The main focus of the reports is merely the completion of physical construction. The results can be improved if the donor agencies evaluate the PCRs, visit the project site and discuss it with the affected community (Fox & Prescott 2004). However, this is not the case in Bangladesh. In general, the donor agencies tend to think that it is the sole responsibility of the government to oversee the environmental performance of the proponent.

In the case of the KJDRP, the donor's support could have increased the legitimacy of the claims made by affected people. In practice donor agencies (namely the ADB or the WB) were not in place in order to actively support the community. The support of donor agencies for the community might make the proponent more accountable in implementing the mitigation measures. In the case of the two other projects (MPPP and JMBP), donor agencies also provided limited encouragement to people to participate in the implementation of mitigation measures.

The practice of EIAs in Bangladesh is still largely preoccupied with the preparation of EIA reports. This is illustrated by the poor implementation of mitigation measures along with inadequate monitoring, limited community involvement, and minimal supervision from the DOE, the proponents' narrow attitude, and the low level of support from the donor agencies. This means that the post-EIS stage of EIA systems remains a relatively neglected area, despite the fact that substantive outcomes occur and that the ultimate effectiveness of an EIA system depends on the effective implementation of mitigation measures (Bailey 1997, Cashmore et al. 2004, Morrison-Saunders & Bailey 1999, Noble & Storey 2005, Sadler 1988, Sadler 1996, Sanchez & Gallardo 2005, Shepherd 1998, Wood 1995, Wood 1999).

While it is possible for the DOE to control the proponents during the preparation of EISs, it has limited control on proponents at the post-EIS stage of EIA process during the implementation of mitigation measures²⁷. Thus, having a legal authority to enforce the proponents to implement mitigation measures is not enough. Given the socioeconomic and political situation, the DOE needs to play its role as a persuader²⁸ as well as an enforcer. As a persuader, the DOE may convince the politically powerful project proponents by modifying their beliefs, values and attitudes towards the benefits of environmental management. In other words, the DOE has to play its role not only as

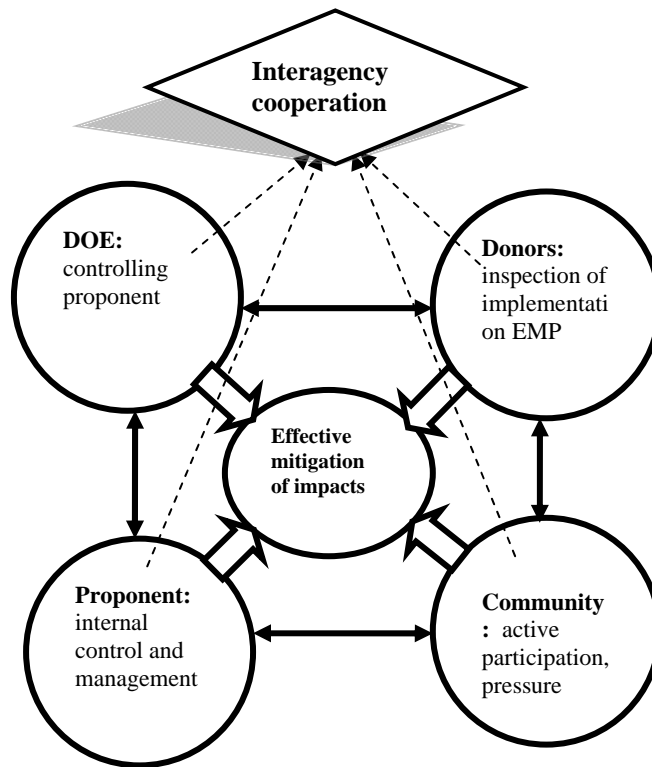
²⁷ It is easy for the DOE to control the proponents at EIS preparation stage because the proponents need to go to the DOE to submit an EIS and obtain an ECC. The DOE may reject the poor quality of an EIS and this may delay the environmental clearance. On the other hand, after the ECC is obtained, proponents are not under direct control as in the time of EIS preparation and, usually, the DOE cannot sue against the public proponents if they do not comply with environmental clearance conditions (such as the implementation of mitigation measures).

²⁸ The persuasion theory is concerned with the shifts in attitude. Persuasion is typically defined as human communication that is designed to influence others by modifying their beliefs or attitude. Persuasion is not accidental or coercive, it is inherently communicational.

a law enforcer, but also as a persuader. Such a situation can lead to mutual trust and cooperation in the successful implementation of mitigation measures.

This study emphasizes that an effective coordination mechanism is required in Bangladesh that allows the proponents, regulators, public and donors to interact with each other. This will aid in achieving constructive outcomes from mitigation measures (Morrison-Saunders, Baker & Arts 2003). The effective management and implementation of mitigation measures depends on the degree of coordination and relationship between the actors involved in the EIA system (Bailey 1997, Brown, Mindmarsh & McDonald 1991, Lee 2000a, Ortolano 1993, Ortolano, Jenkins & Abracosa 1987). This is more than just a good EIA report and Environmental Management Plan. Essentially, the interaction and mutual cooperation among these driving forces would help in the proper implementation of mitigation measures in Bangladesh (Figure7.3).

Figure 7.3: Interaction of four key parties in the implementation and management of mitigation measures



Source: Developed by the researcher

7.5 Overall status of the EIA system in Bangladesh

The current situation (findings in Chapters 4, 5 and 6) reveals that an effective EIA system in Bangladesh is on the right track. Indeed, the current situation of the EIA system in Bangladesh is better than it has been in the past. There has been legislation for EIAs since 1995. The DEO is well mandated by the EIA legislation (ECA) to exercise its power in implementing the EIA. The capacity of the DOE is better than it was fifteen years ago.

Despite this progress, the EIA system in Bangladesh is still far from good practice: the EIA legislation is not comprehensive, the DOE is not well funded and there is a shortage of staff. In addition, the function of the DOE is not decentralised and the EISs (as the product of the EIA process) are still deficient in quality information due to the poor implementation of impact identification, prediction and assessment of impacts and the analysis of alternatives. Moreover, mitigation measures are poorly implemented and, therefore, predicted impacts of a project are addressed inadequately.

7.6 A proposed feature for an effective EIA system in Bangladesh

In this study, a conceptual framework integrating institutional arrangements, quality EISs, and the implementation of mitigation measures was developed and used to evaluate the EIA system in Bangladesh. Using this framework, this study has successfully explicated key features of an EIA system in Bangladesh. Figure 7.4 shows the proposed effective EIA system in Bangladesh. The figure also shows that an effective EIA system in Bangladesh requires appropriate institutional arrangements, assuming the provisions of the EIA process are clearly and adequately prescribed by the legislations (ECA and ECR). The DOE needs to be adequately staffed as well as budgeted so that it can regularly and effectively supervise EIA practice. The functions of the DOE need to be decentralised in order to enhance its scope and capacity to monitor, supervise and support the proponents. The decentralisation of the DOE's function is also necessary to support community participation in the EIA process.

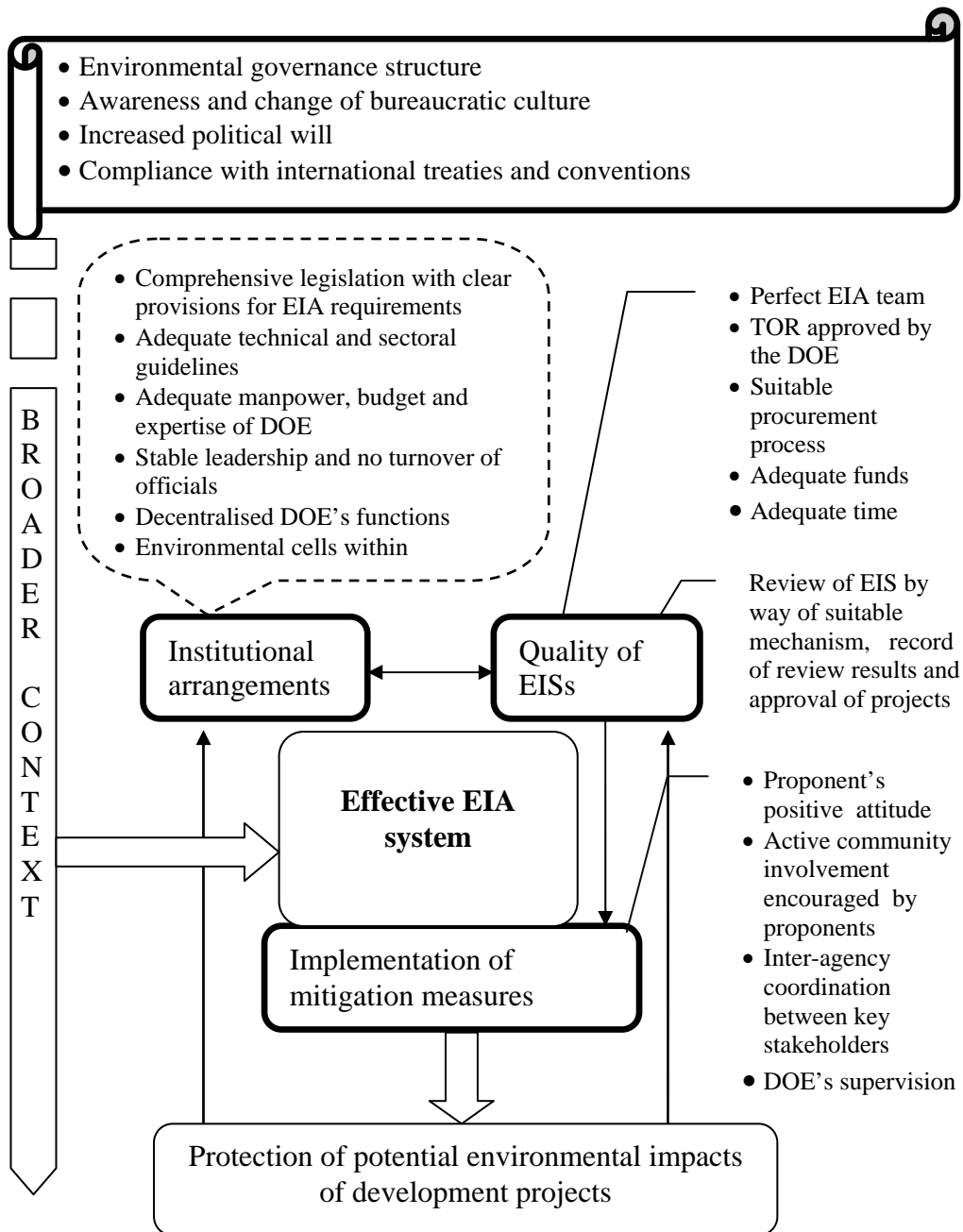
The procedural requirements of the EIA process (such as scoping, collection of base line information, the identification and assessment of impacts using appropriate tools and techniques, the analysis of alternatives, and the preparation of an Environmental

Management Plan) should be effectively addressed. This results in the EISs containing good quality information for decision makers. Similarly, the EIA system requires expert EIA consultants, the preparation of TORs with the vetting of the DOE, the expertise of the DOE in reviewing EISs, and adequate time to study EIAs in order to improve the quality of EISs. Furthermore, changes in the attitude of proponents along with the consultants when preparing EISs is also required in making the EIA system effective in Bangladesh.

Community participation is not only necessary to identify potential impacts of a project, but also to implement the mitigation measures successfully and, thereby, make the EIA system effective. Continuous monitoring and feedback by the proponents is required to implement the mitigation measures successfully and, thereby, address the environmental and social impacts. Moreover, an effective interagency coordination between the donor agencies, DOE, proponents and other entities, such as the Planning Commission, is important during the whole lifecycle of the project.

As well as all of the above, a favourable broader context is necessary to make the EIA system effective in Bangladesh. In particular, an environmental governance system is not well established yet in Bangladesh. Such a system would help to make the people aware of the environmental issues and their rights (thereby changing their attitudes toward environmental stewardship). These broader contextual factors, while taking time to develop, are essential in making the EIA system effective.

Figure 7.4: A proposed effective EIA system in Bangladesh



Source: Developed by the researcher

7.7 Chapter summary

This chapter provided an overall general discussion on the EIA system in Bangladesh based on the study's findings and their analysis. This chapter provided an insight into the EIA system in Bangladesh together with the institutional aspects, the quality of EISs and the implementation of mitigation measures. Steps were taken to substantiate the findings with reference to other studies. The discussion also focused on the shortcomings of the EIA system in Bangladesh and explained the possible reasons for these shortcomings. The next chapter (Chapter 8) states the conclusion of this study in the line of research questions and necessary recommendations for further improvement of the EIA system in Bangladesh.

Chapter-8

Conclusion

8.1 Introduction

This chapter concludes this research by outlining the current situation of the EIA system in Bangladesh. Section 8.2 offers a brief description on the background of this research. Section 8.3 briefly describes key findings (detailed in Chapters 4, 5 and 6) related to the three research questions. Section 8.4 offers the contribution of this study. Section 8.5 provides policy implications, including a number of recommendations for further improvement of the EIA system in Bangladesh. Finally, Section 8.6 states future research agendas that have remained beyond the scope of this study.

8.2 The background, aim and objectives of the research

As an environmental management tool, the potential contribution of the EIA is well recognised. Therefore, over four decades, the EIA has continuously been reviewed and refined in both developed and developing countries (MacDonald 1994). Many countries have reviewed their EIA systems and adapted these according to internationally recognised good practice and local needs. Moreover, the EIA has been reviewed to expand its scope (Abaza, Bisset & Sadler 2004). After the formal introduction of EIAs in Bangladesh in 1995, no systematic and comprehensive research on the EIA system in the country has been conducted to date. In particular, the weaknesses and areas of improvement for the EIA system in Bangladesh have remained unexplored, thus presenting a research gap. This research was an attempt to fulfil this gap.

The aim of this research was to improve the EIA system in Bangladesh by way of two key objectives:

- To identify the strengths and weaknesses of the EIA system in Bangladesh, including the factors associated with the weaknesses of the EIA system, and
- To identify the areas for improvement and provide recommendations for the improvement of the EIA system in Bangladesh.

8.3 Research findings related to three research questions

Using a holistic framework, three key areas (the institution, the quality of EISs, and the implementation of mitigation measures) were investigated in order to address three research questions. Different data collection techniques (predominantly qualitative methods) were used (details in Chapter 3) for the collection of data so as to understand the EIA system in Bangladesh.

8.3.1 Question 1: To what extent are the institutional arrangements of the EIA system adequate in Bangladesh?

This study demonstrates that there is legal support for the application of the EIA in Bangladesh. Furthermore, there are separate environmental agencies responsible for implementing it. However, the existence of legislation and of environmental agencies is not enough. The legislation should be comprehensive in depicting the requirements of an effective EIA system. The findings show that current legislation in Bangladesh cannot adequately meet the requirements of good EIA practice. Some generic features of the EIA process are not clearly prescribed by the EIA legislation. Some provisions of EIA requirements mentioned in EIA legislation are ambiguous in wording and thus

deficient in clarity. These shortcomings lead to uncertainty, unintended costs and inconsistency in the application of EIAs.

The DOE is under-resourced in terms of budget and manpower. The DOE also has a number of problems including unstable leadership, the frequent turnover of top officials, low position in the government bureaucratic hierarchy, and the lack of adequate expertise. Given its inadequate resources, the performance of the DOE in the efficient delivery of service is highly compromised. The DOE is often not able to supervise the project proponents and to ensure the effective application of the EIA process. The frequent turnover of top officials undermines the consistency of EIA application and places the DOE's permanent officials in a disadvantaged position with minimal opportunities for promotion. The DOE also struggles to enforce the proponents and to influence the sectoral agencies due to its relatively low position in the government bureaucratic hierarchy. This also limits the DOE's ability to enforce the stakeholders to cooperate in the preparation of EIA reports and the implementation of mitigation measures.

8.3.2 Question 2: What is the quality of EISs in Bangladesh? (That is, how adequately are the requirements of the EIA process addressed in practice?)

This study finds that the quality of EISs is 'satisfactory only' on a scale of A to F and, therefore, interventions are needed to improve their quality. The findings also show that a significant number of EISs have poor content. This content includes poor baseline data, poor prediction of impacts and assessment of significant impacts, analysis of alternatives, and the poor design of mitigation measures.

A number of factors influencing the quality of EISs emerged from the field interviews. These include the lack of an adequate budget, limited time given for the EIA study, the attitude of proponents, a defective bidding process, and the lack of skilled EIA practitioners in the preparation of EISs.

8.3.3 Question3: To what extent are the proposed mitigation measures implemented at the post-EIS stage of the EIA process in Bangladesh?

By examining three projects, the study has identified that mitigation measures are inadequately implemented. Also, the scope of monitoring and involvement of community in the implementation of mitigation measures is limited. This deficiency in EIA practice at the post-EIS stage was due to a number of factors that emerged from the interviews with project stakeholders. The factors are the proponents' attitude, inadequate monitoring and community participation and the lack of supervision by the DOE.

The proponents' unfavourable attitude towards environmental stewardship is one of the major factors influencing the limited outcomes of the implementation of mitigation measures. The DOE, despite its strong legal authority, cannot enforce the application of EIAs due to a shortage of staff, political intervention, and, sometimes, the lack of sincerity of DOE officials. The donor agencies, namely the Asian Development Bank and the World Bank, and the highest project approval authority, namely the Planning Commission, do not show much interest in the environmental performance of proponents during the implementation and operation of projects.

8.3.4 Conclusion to the research problem: an effective EIA system in Bangladesh

The findings that emerged from this investigation (Chapters 4, 5 and 6) have provided an insight into the current status of the EIA system in Bangladesh. To conclude, the findings of this study indicate that the EIA system in Bangladesh is on the right track with effort being made by the government of Bangladesh and other stakeholders. However, the EIA system is still far from fulfilling good practice requirements and local needs. There has been limited success in providing an environmental agency with adequate capability and in providing quality information. In addition, mitigation measures are not adequately implemented at the post-EIS stage of the EIA process. Therefore, the government of Bangladesh needs to take necessary action to make the EIA system more effective. With this in mind, a number of recommendations are made below in Section 8.4.

8.4 Policy implications

The aim of this study was to improve the EIA system in Bangladesh. After the critical investigation of current EIA system, this study has identified key loopholes and factors that are responsible for the current shortcomings in the EIA system of Bangladesh. The policy implications for the improvement of the EIA system in Bangladesh are as follows:

8.4.1 Improvement in institutional arrangements

1. The legislation must provide sufficiently clear and specific provisions in order to ensure the consistent operation of the EIA system. The EIA legislation should be

amended to include adequate and clear provisions of EIA requirements. The stages of the EIA process (scoping the analysis of alternatives, the evaluation of impacts, and the contents of an EIS) and other requirements, such as provision of EIAs for the extension of project and the review process of EIA reports, need to be defined by the current EIA legislations. Some existing unclear and incomplete provisions (such as site clearances and the validity of Environmental Clearance Certificates) need to be amended. The generic stages of EIAs and the core procedural requirements of EIAs must be explicitly inserted in the current EIA legislations. The sectoral guidelines then may illustrate the methodological requirements of each stage of the EIA process and the responsibilities of stakeholders, and the procedure for the detailed review of EISs.

2. The government of Bangladesh can take immediate action in enhancing the capacity of the DOE. The DOE should be equipped with adequately trained staff and ample budget, and stable leadership with a view to enforcing the proponents' efficient and practical compliance with EIA requirements. Setting up environmental units within the Planning Cell at different ministries may facilitate better inter-agency coordination. This in-house capacity will not only assist in lessening the proponents' dependency on EIA consultants to prepare a TOR, but also enable them to oversee the consultants when they prepare EISs. Only the government's initiative can lead in forming a desirable EIA system with strong institutional arrangements in the near future.

3. The decentralization of the DOE's function and administration at district and Upa-Zilla (Sub-district) levels (two important administrative tiers of central government) is an urgent need. This will not only enhance the DOE's capacity to closely monitor and supervise the implementation of mitigation measures of a project, but also easily and actively facilitate the participation of community members in the process.

8.4.2 Improvement in the quality of EISs

1. It is necessary for the DOE to show initiative in establishing an up-to-date environmental database as the source of baseline data and to make the information accessible to all EIA practitioners. There should be the practice of publishing EISs in the Bengali language in order to make the EISs easily accessible to all professions in the broader public in Bangladesh. The Non Technical Summary, at least, should be published in the Bengali language.
2. An attitudinal change favourable to good EIA practice on behalf of the proponent is necessary. This is possible only when they are well aware of the environmental consequences of a development project and the ultimate benefits of the EIA application. Training and education program put forward by the DOE in order to develop awareness among the proponents are, therefore, an urgent need.
3. In order to control the bias of EIA consultants in the preparation of EISs, ethical codes of conduct should be initiated by the government. The introduction of an

accreditation system to maintain the quality of EIA consultants may also improve the quality of EISs.

8.4.3 Improvement in the implementation of mitigation measures

1. The active participation of the local community can make the implementation and monitoring program effective. Currently, active community participation in the implementation of EMPs and monitoring activities can supplement the DOE's limited overseeing capacity. Importantly, in some situations, citizens' information about environmental change has proven to be equal or superior in quality to that of the experts (Hunsberger, Gibson & Winner 2004). Therefore, the proponents should involve the members of affected community in the implementation of mitigation measures. As a developing country, people are not very aware of environmental issues in Bangladesh. Therefore, active community participation depends on the proponents and their hired EIA experts.
2. The donors should control the release of funds based on environmental performance of proponents. This will enforce the proponents to make the implementation of mitigation measures and monitoring activity effective. It is often difficult for the DOE to prosecute public proponents (mainly for political reason), but sanctions by the donor agencies may work to overcome this problem. Nevertheless, donor agencies can play a vital role in encouraging the proponents to involve the local community during the implementation of

mitigation measures. Close communication between donor agencies and proponents is required, especially when the project is funded by donor agencies.

3. Systematic interagency cooperation and coordination among the core stakeholders (the DOE, donor agencies, the community and the proponent) is essential for improving EIA practice in Bangladesh. These actors are the most important driving forces in achieving constructive outcomes from mitigation measures (Morrison-Saunders, Barker & Arts 2003). In addition, regular meetings of the National Environmental Council undertaken by the initiative of MoEF may facilitate interagency cooperation and coordination in order to implement the mitigation measures and other management activities.

8.5 Contribution of this research

Information generation: This research has comprehensively examined the EIA system in Bangladesh and, thereby, contributed a body of knowledge for the wider community as well as policymakers in Bangladesh. To the best of researcher's understanding, this is the first comprehensive study on the EIA in Bangladesh since its introduction in 1995. It is intended that the systematic and scientific information that has arisen from this study will be of use to policy makers in Bangladesh to aid in understanding the current situation of the EIA and to take necessary policy measures to make it more effective. This study has also made a number of recommendations for ensuring an effective EIA system in Bangladesh. A number of publications (two international journal articles and three peer reviewed conference proceedings) based on the findings of this research (list

of publications is on page v) have contributed to the EIA literature by way of new information for the wider community.

Application of review criteria: This study used the Lee-Colley (1992) review package to review the quality of EISs in Bangladesh. This review package has been adapted to the context of Bangladesh. While the DOE officials or the EIA practitioners do not usually use such criteria to judge the quality of EISs, this adapted review package can be helpful for them. With consistent practice, the use of such generic review package may help in improving the quality of EISs in Bangladesh.

Overall, the findings of this research reveal the status of EIA system in Bangladesh. These findings are important insight for the policy makers in Bangladesh. This can help them to understand how the EIA system is operating in Bangladesh. This insight can be used to lead to the improvement of EIA system in Bangladesh.

8.6 Limitation of this research and future research directions

Having made the above contributions, further research is required. Although this study has covered key areas of the EIA system in Bangladesh, it was not possible to analyse some issues of the EIA process in detail due to limited time and resources. The issues where further research is warranted include the quality of Initial Environmental Examination (IEE) reports, community participation in the EIA process and broader outcomes of EIA application.

1. **Quality of Initial Environmental Examination (IEE) reports:** In this study, the quality of IEE reports was not taken into account when studying the quality of EISs. A review of the quality of these reports is required since the decision to go for a detailed EIA depends on the quality of the IEE.
2. **Community participation:** This study briefly investigated the role of the community in the EIA process in Bangladesh, particularly at the post-EIS level. It was not possible to investigate community participation in detail in this study due to limited time. Therefore, a further study on community participation in the EIA process can be a future area of research.
3. **Broader outcomes of EIA application:** This study focused only on the implementation of mitigation measures at the post-EIS stage of EIAs as substantive outcomes. It was not possible to investigate the influence of EIAs on broader decision-making outcomes relating to the reform of EIA legislation, the modification of administrative structure, or the change in the societal views and bureaucratic culture in favour of environmental management. Further research could be done on this topic so as to understand these substantive, but long- term outcomes.

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APPENDIX-A: Checklist/criteria

Checklist for review of EIA system in Bangladesh

1. Clear legal arrangements for effective EIA system
 - a) Clear legal basis of EIA system
 - b) Clearly documented act and regulations for EIA process
2. Adequate legal arrangements for EIA system
 - a) Necessary steps of EIA process (from screening to monitoring and implementation of mitigation measures) adequately mentioned by act and regulations as mandatory.
 - b) Procedural requirements of EIA are clearly mentioned by legislations and enforceable in practice
 - c) Clear outline of EIA procedures with roles and responsibilities of stakeholders and time limits exist for EIA system.
 - d) EIA legislation covers both government and private projects applicable to EIA
 - e) EIA requirements are enforceable through the court's action
 - f) EIA legislation clearly specifies community participation at all stages of EIA process
 - g) The legislated EIA includes broad definition of environmental/coverage of factors
 - h) Overall, the legal provisions of for an effective EIA system are adequate and clearly understandable and enforceable in practice.
3. Are there a set of adequate local EIA guidelines and manuals in place? for:
 - a) Guidelines sector specific projects
 - b) EIA report preparation and contents
 - c) For EIA report review
 - d) Prediction and evaluation of impacts
 - e) Public participation in EIA process
 - f) Development of mitigation action plan and its implementation
4. International environmental policies, agreements and conventions exist in place to support EIA

5. The EIA is integrated into project cycle and integration of environmental factors into project design, approval and implementation occurs properly.
6. There are codes of conduct for controlling EIA consultants
7. Accreditation system to recognise genuine and skilled EIA consultants
8. Adequate administrative arrangements for EIA system
 - a. Separate environmental agency responsible for administration and development of EIA system.
 - b. Sufficient enforcement authority and capacity of environmental agency (DPE) to administer and implement EIA?
 - c. The environmental agency is appropriately decentralized for EIA activities
 - d. Adequate staff for EIA unit in the environmental agency (DOE) to implement EIA
 - e. Staff with adequate skills both at central and lower tiers for EIA administration
 - f. Adequate measures in place for human resource development with adequate training programs.
 - g. Stable leadership and incentives for staffs of environmental agency
9. Regular sufficient financial and logistic support for the environmental agency from government
10. Effective interagency coordination mechanism
 - a. Coordination between the environmental agency and other stakeholders including sectoral agencies
 - b. EIA or environmental cell in all relevant agencies related to development and resource management whose activities bear environmental cost.
 - c. The position of environmental agency in the government hierarchy is strong
 - d. Adequate support from other stakeholders (donor agencies, Planning Commission) to implement EIA during the whole life cycle of the project
11. Methodological requirements (preparation of EISs), review and approval of EISs
 - a. Screening process/triggers of EIA
 - a1. There is a legal test of whether the action is likely affects the environment significantly

- a2. There is a clear and updated checklist of the type of action to be subject to EIA
 - a3. Clear criteria/thresholds exist for all sectoral projects
 - b. Scoping of EIA
 - b1. Proponents consult stakeholders and the environmental authority early in the EIA process
 - b2. Action specific scoping guidelines and TOR are prepared by the proponent?
 - b3. Overall the scoping involves identification of key environmental components, mode of EIA study, baseline data and clear role and responsibilities that EIA studies to facilitate detail EIA
 - c. Impact identification and assessment of impacts
 - c1. The contents of EIA reports cover all significant impacts
 - c2. Best available methods or techniques employed for impact assessment
 - c3. Accreditation system and code of ethics for EIA consultants exist and effectively applied
 - c4. Environmental agency facilitates proponents to prepare EISs providing with necessary information and consultation
 - d. Alternative options are sufficiently evaluated to minimise environmental impacts of projects
 - e. Environmental management plan sufficiently includes mitigation measures and monitoring activity
12. Review of EIA reports and environmental clearance
- a. An effective review system for EIS review is in place
 - b. An independent review body with appropriate expertise exist
 - c. Checks (checklist or review criteria, TOR) on the objectivity of the EIA report review exist and employed
 - d. Review of EIA reports well recorded and published by the environmental agency
13. Community involvement in EIA process
- a. Community involvement in EIA process is specified by EIA law

- b. Community have opportunity to participate in the whole EIA process
- c. Methods/tools used for communitarian and involvement appropriate for all types of stakeholders
- d. Public inputs formally taken into account by the proponents during the design and implementation of the project

14. Implementation of mitigation measures (post-EIS stage of EIA)

- a. Proponents implement the project in accordance with the conditions of approval of EIA reports
 - a1. Mitigation measures recommended by the EIA report implemented by the proponents adequately
 - a2. Proponents involve community actively in the implementation of mitigation measures
 - a3. Role of important stakeholders such as donor agencies is in place during the implementation of mitigation measures and evaluate the environmental performance of the project.
 - a4. Adequate fund for the implementation of mitigation measures
 - a5. Adequate support and supervision are in place from the environmental agency during the implementation of mitigation measures.
 - a6. There is an internal coordination (between EIA team and project management team) within the proponent's management

15. Formal EIA monitoring in place during the implementation of mitigation measures and operation of projects

- a. Supervision and monitoring activities are carried out by the environmental agency to make the implementation of mitigation measures effective
- b. Adequate supervision and monitoring program are in place and carried out by the proponents
- c. Proponent regularly submits monitoring results to the environmental agency
- d. Proponents share monitoring results and information on mitigation with community
- e. Community people have active participation in monitoring activity

16. Lessons learned from implementation of mitigation measures are incorporated by policymakers and proponents for further development of EIA

17. Environmental agency impose penalties/sanctions against public and private proponents for non-compliance with approval decisions

18. Adequate broader contextual support exists for effective implementation of EIA process

- a. Environmental governance
- b. Adequate international environmental laws and conventions are in place and their implementation
- c. Bureaucratic culture and the mode of economic development
- d. Political will
- e. Socioeconomic conditions

APPENDIX-B: Interview schedule

Interview schedule

Research project: A review of Environmental Impact Assessment (EIA) system in Bangladesh using a holistic approach

(Place of interview: Bangladesh)

Thematic area: Institutional arrangements of EIA

Question-1: An effective EIA system should have adequate legal foundations and the requirements of EIA procedures need to be adequately prescribed by the legislations. **In your opinion to what extent is EIA system fulfilling these requirements in Bangladesh?**

Question-2: The provisions of EIA practice for example screening, scoping, identification and evaluating of impacts, review of EIS and community participation are specified in Environmental Conservation Regulations (ECR)-1997 and also in sectoral EIA guidelines in Bangladesh. As a good practice, EIA needs to confirm these provisions. **In your opinion, how appropriately is EIA confirming these provisions in practice?**

Question-3: An Environmental Agency has the most important role in the effective implementation of EIA in relation to maintain interagency coordination, cooperation and the enforcement of EIA legislation. **How do you evaluate the role of the Department of Environmental (DOE) to effectively implement the EIA in Bangladesh?**

Thematic area: The Quality of EISs

Question-4: An EIA report is a vital output of an EIA exercise. In Bangladesh, a number of EIS are prepared each year. **What is your opinion about the quality of EIS in Bangladesh?**

Question-5: The quality of EISs is poor in many developing countries. As a developing country this is obvious in Bangladesh. **In your opinion, when and why the quality of EIA becomes poor in Bangladesh?**

Question-6: Many development projects implemented in Bangladesh are funded by bilateral and multilateral donor agencies. **What is the role of donor agencies on the effective EIA practice in Bangladesh?**

Question-7: Involvement of the public is an integral part of the EIA process to ensure transparency and credibility. **What is the role of the public in the EIA process in Bangladesh?**

Thematic area: post-EIS stage of EIA process

Question-8: It is important to obtain the actual outcomes of EIA practice in the real world in terms of successful implementation of mitigation measures. **Do you think the mitigation measures are effectively implemented to minimise the environmental impact of a development project?**

Question-9: In addition to minimise the environmental impact of a project what are the overall benefits that can be achieved from EIA exercise?

Question-10: Project based EIAs have some inherent limitations to improve environmental quality. **How will the application of Strategic Environmental Assessment (SEA) be useful to overcome these limitations in the context of Bangladesh?**

APPENDIX- C: Statement of information



Information Statement for the Research Project: A critical review of the EIA system in Bangladesh using a holistic approach

Research Team:

1. Dr Salim Momtaz,
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School of Environmental and Life Sciences
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Email: salim.momtaz@newcastle.edu.au

2. S.M. Zobaidul Kabir
PhD Candidate
School of Environmental & Life Sciences
University of Newcastle, Australia
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Email: S.kabir@studentmail.newcastle.edu.au

You are invited to participate in the research project ‘**A review of EIA system in Bangladesh using a holistic approach**’ which is being conducted by the above mentioned research team. The research is part of S.M. Zobaidul Kabir’s PhD study at the University of Newcastle, supervised by Dr Salim Momtaz, Senior Lecturer, School of Environmental and Life Sciences, University of Newcastle, Australia.

Why is the research being done?

The purpose of the research is to investigate the status of environmental impact assessment (EIA) system in Bangladesh to improve the current EIA practice. Like many other developing countries, Bangladesh has made significant improvement in EIA practice including legal and administrative arrangements. Although Bangladesh has been experiencing the formal practice of EIA for over 15 years, a few researches have been conducted so far in this field. In Bangladesh, many development projects are implemented in public and private sectors to accommodate increasing population pressure and importantly to accelerate economic growth. While EIA is already in place with administrative and legal support, there is still inadequate information on to what extent EIA is confirming the provisions of good EIA in practice. Now also it is time to understand if there are any strengths and weaknesses in EIA practice and the reasons behind the weaknesses. Finally, the above titled research will help to improve the

practice of EIA in the context of Bangladesh providing with policy recommendations. It is expected that the research findings will be considerably helpful to policy makers, decision makers and other relevant stakeholders involved in the EIA practice.

Who can participate in the research?

This research is inviting individuals (18 years+) and organisations who are directly and indirectly involved in EIA practice in Bangladesh and have adequate knowledge on EIA practice. The research is putting efforts to interview as many interviewees as possible to collect information. As an important stakeholder of EIA practice in Bangladesh, **you (or your organisation) are requested to participate in a short-interview.**

What choice do you have?

It is absolutely your choice to participate in this research and to contribute. Only the persons who give their informed consent will be included in this research. Whether or not you decide to participate, your decision will not disadvantage you or your organisation. You or your organisation may withdraw from the research project at any time without giving a reason and have the option of withdrawing any data which identify you.

What would you or your organisation be asked to do?

If you agree to participate, you will be simply asked to put your opinion on a number of issues in relation to environmental impact assessment (EIA) practice in Bangladesh. **Your interview will be recorded on an audio tape. You have the right to review the recording and/or the transcript to edit and/or erase the contribution if necessary.**

How much time will it take?

This will be a face to face interview and will take approximately 60 minutes.

What are the risks and benefits of participating?

This is a purely academic exercise and hence no risks are involved in this exercise as such other than information sharing. Your opinion will be taken into account with due value to write the PhD thesis. If requested, the publication of the thesis or part of it will be made available to you.

How will your privacy be protected?

All the data will be preserved and protected according to the policy of the University of Newcastle, Australia. The information collected by the researchers which might identify you will be stored securely **in a filing cabinet under lock and key** and only be accessed by the researchers, unless you consent otherwise. **The data will be stored for five years in a secured place as indicated by the university.** Information which might identify you will not be disclosed in the thesis or publications without your prior consent. Further clarification on this matter will be made at the start of the interview.

How will the information collected be used?

As mentioned earlier, the information collected thorough interview will be compiled, analysed and used to write a thesis to be submitted for PhD degree at the University of Newcastle. Individual participants will not be identified in the thesis without prior consent.

What do you need to do to participate?

Please read this Information Statement and be sure that you understand its contents before you consent to participate. If there is anything you do not understand, or you have questions, contact the researchers mentioned below. If you would like to participate, please let us know about your availability via return email/phone call and we will then contact you to arrange a time convenient to you for the face to face interview.

Further information

If you would like to have further information please contact Dr Salim Momtaz, University of Newcastle, School of Environmental and Life Sciences, Brush Road, Ourimbah, NSW-2258, Australia, Phone:+612 4348 4131, Fax:+612 4348 4145, Email: salim.momtaz@newcastle.edu.au.

OR

S.M.Zobaidul Kabir, University of Newcastle, School of Environmental and Life Sciences, Brush Road, Ourimbah, NSW-2258, Australia, Phone:+612 0435223224 Or Road: 8, House-41, Banasree, Dhaka -1215, Bangladesh, Phone: 01715279381, Email: S.kabir@studentmail.newcastle.edu.au or **zobadul@yahoo.com**.

Thank you for considering this invitation.

1. Dr Salim Momtaz,
Senior Lecturer and Project Supervisor.

2. S.M.Zobaidul Kabir
PhD Candidate

Complaints about this research

This project has been approved by the University's Human Research Ethics Committee, Approval No.H-2008-0391. Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher, or, if an independent person is preferred, to the Human Research Ethics Officer, Research Office, The Chancellery, The University of Newcastle, University Drive, Callaghan NSW 2308, Australia, telephone **+61 2 49216333**, email **Human-Ethics@newcastle.edu.au**.

APPENDIX- D: Consent form

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Consent Form for the Research Project: A review of Environmental Impact Assessment (EIA) system in Bangladesh using a holistic approach

Document Version 2: dated: 8/11/07

I agree to participate in the above research project and give my consent freely.

I understand that the project will be conducted as described in the Information Statement, a copy of which I have retained.

I understand that I can withdraw from the project at any time and do not have to give any reason for withdrawing.

I agree to participate in a face-to-face interview to discuss various aspects of effectiveness of EIA in Bangladesh.

I understand that my personal information will remain confidential to the researchers and will only be used in research for PhD degree.

- I consent myself to be quoted in PhD thesis and its publication resulting from this interview ☐
- I do not consent myself to be quoted in PhD thesis and its publication resulting from this interview ☐

I have had the opportunity to have questions answered to my satisfaction.

Print Name: _____

Your position within the organization: _____

Name of Organization: _____

Contact Details if you want to receive: _____

Full publications ☐

Summary of publications ☐

Signature: _____ **Date:** _____

APPENDIX-E: List of interviewees (face to face interview)

<u>Interviewees/Reference ID</u>	<u>Organisations</u>	<u>Interview date</u>
Interview#1	CEGIS	29/12/2009
Interview#2	BUET	4/01/2009
Interview#3	WARPO	5/01/2009
Interview#4	BCAS	6/01/2009
Interview#5	SUB	11/01/2009
Interview#6	BUET	14/01/2009
Interview#7	CFSD	16/01/2009
Interview#8	IUCN	20/01/2009
Interview#9	POUS	21/01/2009
Interview#10	SMEC	22/01/2009
Interview#11	BUET	25/01/2009
Interview#12	DOE	04/02/2009
Interview#13	DOE	10/02/2009
Interview#14	DOE	23/02/2009
Interview#15	RCC	23/02/2009
Interview#16	WB	16/02/2009
Interview#17	BRAC	5/03/2009
Interview#18	DU	8/03/2009
Interview#19	IUB	17/03/2009
Interview#20	BUET	28/03/2009
Interview#21	DOE	1/04/2009
Interview#22	DOE	2/04/2009
Interview#23	PC	5/04/2009
Interview#24	PC	6/04/2009
Interview#25	DOE	6/04/2009

APPENDIX-F: List of EISs of projects reviewed

<u>Sl. No</u>	<u>Project ID</u>	<u>Project Name</u>	<u>Year</u>
1	INDUSTRY-01/2000	EIA for CETP Installation on the Industrial Activities at Hazaribag Area, Dhaka	2000
2	INDUSTRY-02/2005	EIA of CETP and other industrial installations in the proposed Tannery Estate, Savar, Dhaka	2005
3	INFRASTRUCTURE-03/2007	Detail Design of Civil Works Under Road Network and Improvement project	2007
4	WATER-04/2006	EIA and SIA of Haor Rehabilitation Scheme (Haor Development and Rehabilitation Project)	2006
5	WATER-05/2006	EIA and SIA for the improvement of navigation and environment of Korotoa River	2006
6	WATER-06/2006	Hatya-Nijhum Dwip Cross Dam Project	2006
7	WATER-07/2007	EIA and SIA of Flood Control Embankment and River Bank Protection on the Left Bank of Jamuna and Right Bank of Dhaleswari River	2007
8	ENERGY-8/2008	2D Seismic Acquisition Survey for the Project of Block 7	2008
9	ENERGY-9/2004	Construction of 25 Km Gas Pipeline From Maulivi Bazar to Rashidpur	2004
10	ENERGY-0/2000	EIA of Meghnaghat Power Plant Project-450 MW CC Gas Turbine Power Station Project	2000
11	ENERGY-1/2005	Nakla, Hatikumut-Bonara-Ishwardi-Veramara 101 km Gas Transmission Pipe Line Project,	2005
12	ENERGY-2/2001	EIA of Bangabandhu Bridge Approach Road Gas Pipeline Project	2001
13	ENERGY13/2008	Bakharabad-Siddhirganj Gas Transmission Pipeline Project	2008
14	ENERGY-4/2008	Recompletion of Wells at Titas and Bakharabad Gas Fields and Installation of Gas Process Plant at Titas Gas Field	2008

15	ENERGY-15/1999	EIA for REJU-1 Offshore Exploration Drilling at Block 7	1999
16	INFRASTRUCTURE-16/1998	EIA of North Dhaka East Sewerage System	1998
17	ENERGY-17/2008	EIA of Siddhirganj-Manikganagar 230 KV Transmission Line Project	2008
18	ENERGY-18/2001	Environmental Impact Assessment of gas project - Block 5	2001
19	WATER-19/2007	EIA and SIA for Integrated Water Resource Management in Chalan Beel Area Development Project	2007
20	INDUSTRY-20/2001	EIA of American and Efrid Bangladesh Sewing Thread Dyeing and Finishing Plant	2001
21	WATER-21/1998	EIA of Nijhum Dwip Integrated Development Project	1998
22	INDUSTRY-22/2005	17 (Seventeen) km Long Overland Elevated Belt Conveyer Project	2005
23	WATER-23/2005	Southwest Area Integrated Water Resources Planning and Management Project	2005
24	ENERGY-24/2008	EIA of 2X250 MW Gas Turbine Power Plant at Siddhirganj Project	2008
25	WATER-25/2001	Environmental Impact Assessment of Gorai River Restoration Project	2001
26	INDUSTRY-26/1997	Environmental Impact Assessment of Lafarge Surma Cement Project	2001
27	WATER-27/1998	EIA of of Khulna-Jessore Drainage Rehabilitation Project	1998
28	INFRASTRUCTURE-28/1990	Environmental Impact Assessment of Jamuna Multipurpose Bridge Project	1990
29	INFRASTRUCTURE-29/2007	Environmental Impact Assessment of Third Karnaphuli Bridge Project	2007
30	INFRASTRUCTURE-30/1996	EIA of Nalka-Hatikamrul-Bonpara New Road Project	1996

APPENDIX-G: A sample of collation sheet

Name of Project:

Concerned Ministry/Organisation:

Name of Consulting Firm:

Source of finance (GOB/Donor Aided):

Year of preparation:.....

Size of EIA Team:.....

Length of EIS:pages

AREA	Grade Points	AREA	Grade Points	AREA	Grade Points	AREA	Grade Points
1		2		3		4	
1.1		2.1		3.1		4.1	
1.1.1		2.1.1		3.1.1		4.1.1	
1.1.2		2.1.2		3.1.2		4.1.2	
1.1.3		2.1.3		3.1.3		4.1.3	
1.1.4		2.1.4					
1.1.5							
1.1.6							
1.1.7							
1.1.8							
1.2		2.2		3.2		4.2	
1.2.1		2.2.1		3.2.1		4.2.1	
1.2.2		2.2.2		3.2.2		4.2.2	
1.2.3		2.2.3		3.2.3		4.2.3	
1.2.4							
1.2.5							
1.3		2.3		3.3		4.3	
1.3.1		2.3.1		3.3.1		4.3.1	
1.3.2		2.3.2		3.3.2		4.3.2	
1.3.3		2.3.3		3.3.3			
		2.3.4		3.3.4			
1.4		2.4				4.4	
1.4.1		2.4.1				4.4.1	
1.4.2		2.4.2				4.4.2	
		2.4.3					
		2.4.4					
1.5		2.5					
1.5.1		2.5.1					
1.5.2		2.5.2					
1.5.3		2.5.3					
1.5.4		2.6					
1.5.5		2.6.1					
1.5.6		---2.6.4					

APPENDIX-H: Summary results of the quality of 30 EISs

SI No	Project ID	Area#1	Area#2	Area#3	Area#4	Overall Quality
1	INDUS-01/2000	D	F	F	E	E
2	INDUS-02/2005	B	D	C	B	C
3	COM-03/2007	C	B	B	B	B
4	WATER-04/2006	C	B	B	A	B
5	WATER-05/2006	B	B	A	A	A
6	WATER-06/2006	B	D	C	C	C
7	WATER-07/2007	C	C	C	B	C
8	ENERGY-08/2008	D	E	C	E	D
9	ENERGY-09/2004	A	C	D	B	B
10	ENERGY-10/2000	C	C	D	C	C
11	ENERGY-11/2005	B	C	B	B	B
12	ENERGY-12/2001	C	D	D	D	D
13	ENERGY-13/2008	D	E	E	D	D
14	ENERGY-14/2008	C	D	C	C	C
15	ENERGY-15/1999	C	E	C	C	D
16	URBAN-16/1998	B	D	C	B	C
17	ENERGY-17/2008	C	C	C	B	C
18	ENERGY-18/2001	E	F	E	D	E
19	WTER-19/2007	A	B	A	A	A
20	INDUS-20/2001	D	E	D	B	D
21	WATER-21/1998	C	C	C	D	C
22	INDUS-22/2005	C	D	C	D	D
23	WATER-23/2005	A	C	C	A	B
24	ENERGY-24/2008	A	B	B	A	A
25	WATER-25/2001	B	B	C	B	B
26	INDUS-26/1997	C	E	D	B	D
27	WATER-27/1998	C	C	B	B	C
28	COM-28/1990	B	D	C	C	C
29	COM-29/2007	C	D	B	B	C
30	COM-30/1996	B	B	B	A	B

Summary

Areas	Total 'A'	Total 'B'	Total 'C'	Total 'D'	Total 'E'	Total 'F'
Area#1	4	8	13	4	1	0
Area#2	0	7	8	8	5	1
Area#3	2	7	13	5	2	1
Area#4	6	12	5	5	2	0
Overall	3	6	11	8	2	0

APPENDIX-I: List of participants/key informants for three projects

Project-1: Khulna-Jessore drainage rehabilitation project (KJDRP)

<u>Interviewee/Reference ID</u>	<u>Organisations</u>
1. KJDRP-Mijubul	CEGIS
2. KJDRP-Reja	BUET
3. KJDRP-Shafiq	WC*
4. KJDRP-Hashem	WC
5. KJDRP-Khaleq	ADB

*WC=Water Committee

Project-3: Jamuna multipurpose bridge project (Bangabandhu Bridge)-JMBP

<u>Interviewee/Reference ID</u>	<u>Organisations</u>
1. JMBP-Benu	JMBA
2. JMBP-Reja	BUET
3. JMBP-Feroz	BUET
4. JMBP-Ohid	JMBA
5. JMBP-Tofazzal	JMBA
6. JMBP-Najzim.	JMBA
7. JMBP-Istaq	IUCN
8. JMBP-Hafiza	DU

Project-2: Meghnaghat power plant project (MPPP)

<u>Interviewee/ Reference ID</u>	<u>Organisations</u>
1. MPPP-Mahmud	MPPP
2. MPPP-Raja	PAPs committee*
3. MPPP-Mokhter	PAPs Committee
4. MPPP-Nishat	IUCN
5. MPPP-Jewel	RCC

*PAPs=Project Affected Persons

APPENDIX-J: Summary information sheet for mitigating measures

**Research title: A review of Environmental Impact Assessment (EIA) system in Bangladesh
using a holistic approach**

(To be used for post-EIS stage of EIA practice)

1. Name of Project:

2. Executing Agency:

3. Year of Implementation:

4. Location of project:

5. Status of implementation of mitigation measures and monitoring

5A. Status of mitigation measures implemented for a project

Mitigation measures	Status of implemented mitigation measures			Reasons why mitigation measures were implemented partly, fully or not at all
	Fully	Partly	Not at all	
1.				
2.				
3.				
4.				
.....				
.....				

5B. Status of implemented mitigation measures of three projects

Projects	Mitigation measures (N*)	Responsible agencies	Status of mitigation measures implemented		
			Fully implemented (N ₁)	Partly Implemented (N ₂)	Not at all Implemented (N ₃)
KJDRP					
JMBP					
MPPP					

*N (Total number of mitigation measures) = N₁ + N₂ + N₃

5C. Comparison of status of implemented mitigation measures among three projects

Projects	Status of mitigation measures implemented		
	Fully implemented (%)	Partly implemented (%)	Not at all implemented (%)
KJDRP			
JMBP			
MPPP			