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ENVIRONMENTAL ASPECTS OF ENERGY EXPLORATION IN BANGLADESH AND THE ROLE OF EIA: THE CASE OF THE SUNDERBANS

Abstract

Since the 1990s, mainly under economic compulsions, Bangladesh opened up its energy sector for the International Oil Companies to explore and exploit hydrocarbon resources in different blocks in the country, including the ecologically critical Sunderbans. Under the existing rules and regulations in Bangladesh, hydrocarbon exploration projects require to carryout a mandatory Environmental Impact Assessment (EIA) process and implement the recommended measures. In this respect, the article discusses various aspects that the EIA document should take into consideration and their application in the case of Bangladesh. Reviewing EIA processes and documents, the article finds different problems with respect to its application in Bangladesh as in other countries for a number of reasons. Consequently, true adherence to EIA continues to remain half-hearted in most of the cases. If it continues to be so, deterioration in environmental conditions with decline in the quality of people's life would remain as a challenge in the future.

1. Introduction

Energy serves as the backbone of modern societies. Much of the progress made in modern times has been possible thanks to the use of fossil fuel (i.e. Coal, oil and natural gas). However, energy's contribution to the development of mankind did not come with unmixed blessings. Whatever may be the immediate source – coal, oil, gas, electricity, hydropower, wind, tides, uranium or hydrogen –

it all comes from environment and cannot be exploited without some impact on the environment.¹

Since the availability of natural gas is one of the prerequisites for the country's development, the government in bangladesh has opened up the energy sector² for foreign investors in the early 1990s, which included both the exploration of natural resources and the production of electricity. For the purpose of attracting foreign investment in natural gas exploration, the country has been divided into 23 blocks. The sunderbans in the southwestern part of the country falls in block 5. Several factors were responsible for the opening up of the country's hydrocarbon sector for foreign investment. Some of those factors are:

1. Economic compulsion to cut down the cost of petroleum import and the need for foreign direct investment to meet the balance of payment;
2. Donor assistance in the development of energy sector was on the wane. However, it was mainly concentrated in the development of the power sector rather than the exploration and development of oil and gas fields;
3. To ensure economic development alongside the compulsion as per constitutional obligation to provide energy, particularly electricity, to nearly 78 percent of the population;
4. Finally, to provide cleaner alternative to biomass or oil as fuel through the promotion of natural gas.

¹ J. Lenihan and W. W. Fletcher (eds.), *Energy resources and the environment*, (Glasgow: Blackie, 1975), p. 46.

² In Bangladesh, broadly three types of energy resources – hydrocarbon, renewable and biomass – are used. Coal, oil and gas fall within the category of hydrocarbon based energy sources. 55 percent of the energy used is derived from traditional fuel or biomass, 24 percent natural gas, 19 percent through imported oil and 2 percent is provided by the hydro-electricity. However, natural gas constitutes 69 percent of the commercial energy consumption and industries as well as power plants are the chief consumers of it. Natural gas is the country's only significant source of non-renewable energy resource.

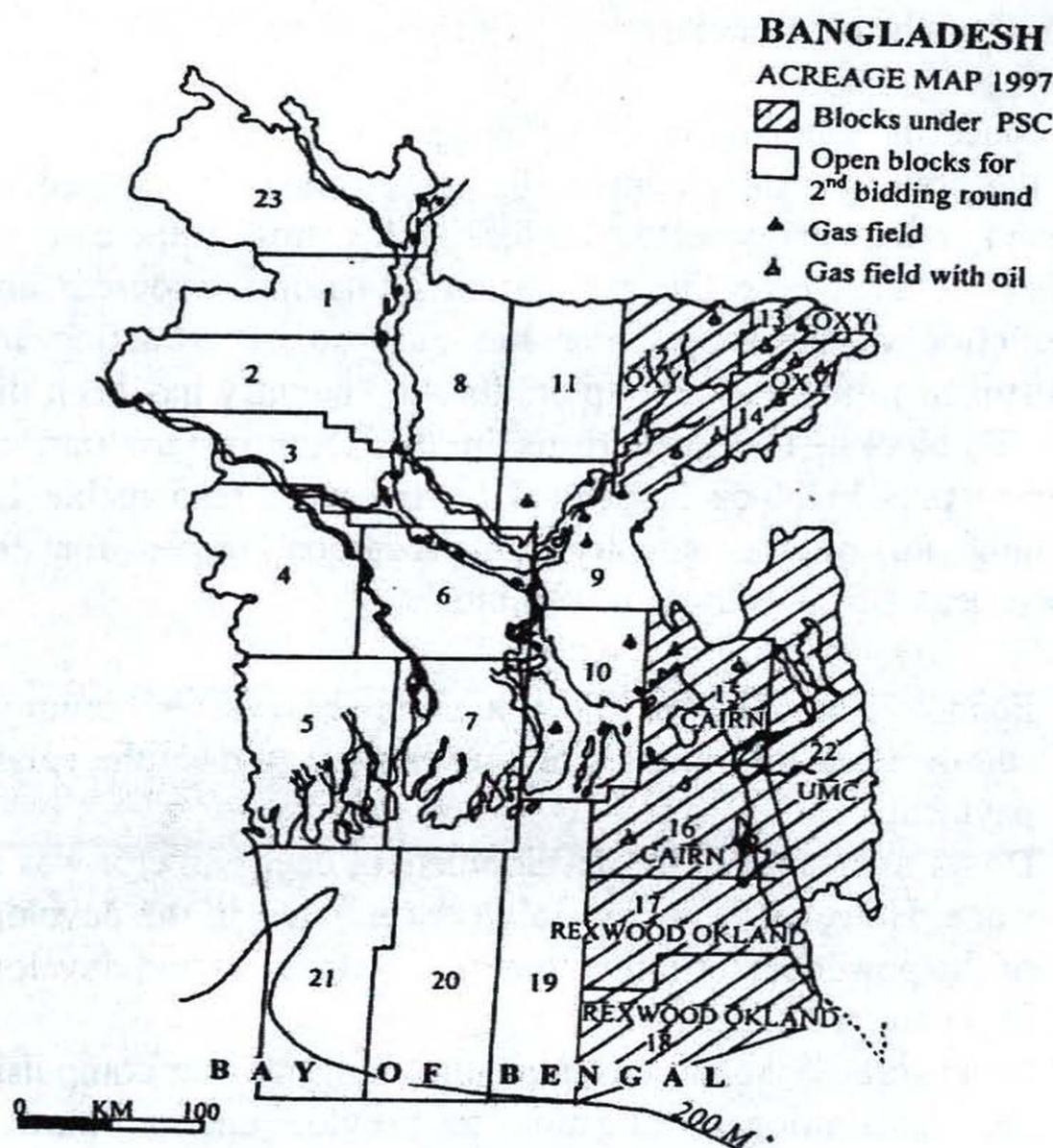


Fig. 1: Hydrocarbon Exploration Blocks in Bangladesh

Source: Ahmed, A. U. (2000), "Development of gas sector in Bangladesh: status, policy options and challenges", in Sobhan, R. (ed.), *Changes and Challenges: A Review of Bangladesh's Development 2000*, (Dhaka: University Press Limited).

There is no gainsaying that the opening up of the energy sector, although brought in the much-needed foreign investment in the country, it was coupled with environmental hazards. The accidental blow-up, on June 15, 1997, at one of the exploratory wells in Sylhet, in the Southeastern part of the country, by one of the International Oil Companies (IOCs) is a case in point. The subsequent destruction of the surrounding eco system has generated widespread concern

about the environmental costs of such explorations. In this respect, the relevant question is: how to keep environmental impact at a minimum? Analysts and experts on the subject opine that by conducting an Environmental Impact Assessment (EIA) and through the strict adherence to the suggested Environment Management Plan (EMP), accompanying the EIA document, before the enunciation of the project, many negative environmental impacts can be avoided. The argument finds its rationale in the fact that EIA has been termed as a comprehensive document regarding the possible impact of a project.³ It has been used as a decision making tool by the environmental policymakers to determine the conditions that are to be imposed on a project to mitigate the negative impacts from the project and to determine the acceptability of the project on the basis of its environmental costs.

A pertinent query is: what is the status of EIA in Bangladesh? In case of hydrocarbon exploration, the provision of conducting an EIA has been mandated in various legislations in Bangladesh. The accident in Sylhet took place despite such provisions in the legislations and an EIA conducted prior to the commissioning of the project. This has created doubts about the efficacy of the EIA regime. Such doubts deepen with the governmental decisions to sign Production Sharing Contract (PSC) with IOCs for exploration and exploitation of oil and gas in the ecologically fragile areas of mangrove forests – the Sunderbans – lying in the southwestern coastal zone of the country.

In the above backdrop, the paper attempts to study whether the present EIA regime in Bangladesh is capable enough to minimise the environmental impacts of such projects in the ecologically fragile areas of the Sunderbans. In this respect, the paper attempts to analyse the consequences of the short- and long-term anthropogenic intervention for oil and gas exploration on the fragile eco-system of

³ E. Leknes, "The role of EIA in the decision-making process", *Environmental Impact Assessment Review*, 21, 2001, pp. 309-334.

the Sunderbans and examine whether the present EIA regime in Bangladesh is effective enough to minimise such impacts. With these objectives in mind, the paper deals with the environmental aspects of energy exploration in Bangladesh and the role of EIA with focus on the Sunderbans. The paper is divided into six sections including this introductory one and the conclusion. The second section of the paper entitled 'Oil exploration and the need for EIA: A general discussion' gives a brief description of the process of conducting an EIA in general with reference to Bangladesh where it is relevant. The third section entitled 'Oil exploration in the Sunderbans: An assessment of its environmental affects' discusses the economic and ecological importance of the Sunderbans. The fourth section entitled 'Regulations pertaining to environmental conservation in Bangladesh' provides an overview of the environment conservation legislations in Bangladesh. The fifth section entitled 'Discussions on the EIA process in Bangladesh' analyses different issues in the EIA legislation and implementation process with a discussion on an EIA report of a power plant in Bangladesh. Finally, the paper ends with a conclusion where it is suggested that without effective regulatory and monitoring regime, the present EIA process in Bangladesh is unlikely to ensure the maintenance of environmental quality in the country.

2. Oil Exploration and the Need for EIA: A General Discussion

From exploration to consumption, the Organisation for Economic Co-operation and Development (OECD) identifies seven stages of energy cycle.⁴ They are: exploration; harvesting; processing; transport; storage; marketing and end use. However, it is the impact of fossil fuel consumption on environment that has been one of the most discussed issues. Any type of fossil fuel consumption emits carbon dioxide (CO₂) in the combustion process,

⁴ OECD, *Environmental effects of energy systems – the OECD compass project*, cited in J. Blunden and A. Reddish (eds.), *Energy, Resources and Environment*, Somerset, 1983, Hodder & Stoughton.

one of the most significant green house gases. According to the Intergovernmental Panel on Climate Change (IPCC), CO₂ accounts for over half of the heat trapped, causing global warming. Roughly 45 percent of the heat trapped from 1980 to 1990 was attributable to energy production and use.⁵ Apart from the discussion on the contribution of fossil fuel to climate change, the other most discussed topic regarding energy and environment is the impact of oil spillage on the environment. The first is related to the end use of fossil fuel and the latter with its transportation. The use of biomass as fuel and its contribution to deforestation has been another popular issue of discussion. In comparison to the afore-mentioned issues related to energy and environment, there are fewer discussions on the environmental impacts of hydrocarbon (i.e. oil and natural gas) exploration.

However, the relatively lesser amount of discussions centering on the impact of hydrocarbon exploration does not mean that exploration for hydrocarbon either offshore or onshore is without significant impact on the natural environment. Since 1988, the exploration for hydrocarbon has threatened the frontier forests in 22 countries, coral reefs in 38 countries, mangrove forests in 46 countries and indigenous people in 6 continents, not to mention the destruction of the global climatic stability.⁶

Ecological regions vary from each other and each has its own unique setting. This gives some sort of uniqueness to every region in terms of its natural environment. Based upon ecological regions as well as on the nature and extent of intervention, the impacts of human interaction on natural environment vary from each other.

⁵ R. T. Watson and the Core Writing Team, (2001). *IPCC climate change 2001: synthesis report*, available from http://www.grida.no/climate/ipcc_tar/syr/008.htm [accessed on 29/08/02].

⁶ Rainforest Action Network (RAN), (2000). *Drilling to the ends of Earth: the case against new fossil fuel exploration*, available from <http://www.ran.org/oilreport/numbers.html> [accessed on 22/08/02].

Similarly, EIAs differ from each other in terms of siting, the type and extent of the project etc.

Keeping the uniqueness of the Sunderbans in terms of its ecological settings in mind, the following chapter attempts to discuss the EIA processes in the light of the *Guide to the Environmental Conservation Act 1995 and Rules 1997*.⁷ The Guideline identifies three important stages for the development of the EIA study. These are:

- Screening
- Scoping
- Initial Environment Examination (IEE) and
- Detailed Environmental Impact Assessment report

Screening:

Screening is the stage to decide the level of environmental review a project has to undergo. In Bangladesh, according to the nature of the project, Department of Environment (DoE) has to determine whether the project needs an EIA or not under the four categories mentioned in the Environment Conservation Rule '97 (ECR). Under the ECR '97, mining and energy exploration activities fall within the Red category⁸, which makes it necessary to produce an IEE as well as an EIA report in order to obtain site clearance and the environmental clearance. The screening process is followed by scoping for the project.

Scoping:

Scoping is the process to determine the geographical region and the issues that are to be addressed, the information that should be collected and the analysis that might be required to assess the environmental impact of a particular project. In a hydrocarbon

⁷ *Guide to the environmental Conservation act 1995 and Rules 1997*, Dhaka: Bangladesh Centre for Advanced Studies (BCAS), Dhaka, 1999.

⁸ *EIA Guidelines for Industries*, Ministry of Environment and Forest: Dhaka, 1997.

development project, there are no options as far as location is concerned. The project site is pre-determined by the location of the extractable mineral, which can even be in an environmentally sensitive area. In such a project, it is, therefore, very important to address the issues regarding mitigation of the impacts.

Project developments in ecologically fragile areas are characterised by high degrees of uncertainties. 'The scale of project and its possible impacts are very large, the impacts of technology unclear, and the base data often lacking or inadequate. For impact assessment this reinforces the importance of adequate scoping, the determination of valued environmental components and the scientific credibility of prediction and significance assessment'.⁹ The current loci of development are proceeding without adequate knowledge of baseline conditions or an understanding of the dynamic ecological relationship.

The primary output of the scoping process is the Terms of Reference (ToR) required to conduct an EIA and for the preparation of the EIA report. In Bangladesh, the responsibility for preparing the ToR is left with the EIA practitioner rather than the EIA administrative agency, who approve the ToR for the EIA.¹⁰ During this phase, the budget and the composition of the EIA team influences the ToR and eventually the EIA report. The team has to work within the limits of the proponent's budget and the training and capabilities of its members influence the outcome.

Momtaz notes that the scoping stage is not clear to the EIA team members in Bangladesh.¹¹ They work within a fixed general

⁹ L. G. Smith, *Impact assessment and sustainable resource management*, Longman Scientific & Technical, New York, 1994, p. 107.

¹⁰ ADB (Asian Development Bank), (1997b). "EIA for the developing countries", available from http://www.adb.org/Documents/Books/Environmental_Impact/Chap2.pdf [accessed on 12/08/02].

¹¹ S. Momtaz, "Environmental impact assessment in Bangladesh: A critical review", *Environmental Impact Assessment Review*, Vol. 22, No. 2: 2002, pp. 163-179.

framework for the preparation of the ToR, where the size of the project is not taken into account. Such an approach may fail to address many important issues for a larger project and at the same time, might make it difficult for a smaller project to prepare their IEE or EIA report.

Initial Environment Examination (IEE):

IEE has been described as a method, which helps understand the potential extent of environment changes that might result from a specific project and suggest the mitigatory measures that should be considered to minimise such environmental impacts. In Bangladesh, scoping is conducted in the context of an IEE.

IEE is usually needed to ascertain whether a project needs to undertake an expensive and comprehensive full-scale EIA. Since IEE is a prelude to EIA, it is usually conducted with a limited budget and is based on the available information, past experience or standard operating practices. The main objectives of IEE are:

- Identifying the extent, nature and severity of the significant environmental issues concerning the proposed project
- The IEE should seek to identify the easily implementable mitigative or offsetting measures to address the environmental issues, chalk out the Environmental Management Plan (EMP) or suggest alternative sites or the required project modifications.
- Should the IEE report find that the project would not produce significant environmental impacts, then the report serves as the final EIA document. However, in the case of hydrocarbon exploration projects, as mentioned earlier, the ECR'97 necessitates the conduction of EIA.

One of the tasks of IEE is to work out the ToR of the full-scale EIA study and to suggest the special topic report, which might be needed instead or in addition to a full-scale EIA report. The ToR should identify the issues that the EIA needs to resolve and provide background information on them.

Since IEE has been described as the prelude to undertaking a full-scale EIA, where excellent judgement and appropriate experience are required, emphasis has been made on the need for recruiting competent professionals. A poor IEE report would not be able to recognise the significant environmental impacts of the project and conversely a good report might result in successful resolution of the environmental issues.

Full-scale EIA:

A rigorous study involves the full-scale EIA where new information on environment is collected. The ECR '97 identifies the steps necessary in conducting an EIA. These are:

Baseline information: This step starts with explaining the rationale of site selection with respect to the impact of the project on the local environment. However, with regards to site selection, as mentioned earlier, there are no other options in hydrocarbon exploration projects. This should contain information about the land use pattern, natural physical and biological resources and socio-economic standards covering a minimum of 10 km. radius. The study should include basic information about the project site, raw materials, process flow, one of the major tasks of EIA is to identify and suggest ways to mitigate the environmental impacts of the project. During this impact identification phase, a broad analysis of the impacts of the project is made with a view to identifying the ones worth of detailed study, which have been unresolved in IEE. These include compilation as well as detailed study of the major sources of impact of the project on the environment. Besides the environmental impact of the project, ECR requires that EIA reports should mention other socio-economic issues, like, public perception of the project.

Impact Evaluation: This phase is designed to determine if mitigation of the identified environmental impacts of the project would be required. The evaluation should be done whenever possible in quantitative terms and should find solutions to the identified environmental impacts. However, suggestion has been made to define project alternatives prior to the initiation of impact

evaluation phase. The ECR mentions that the worked-out mitigative measures should conform to the laws, regulations and the accepted standards set by ECR '97.¹² One of the important conditions mentioned in the ECR is that the proposed project cannot be situated in a protected site and has to be accepted by the local community. Along with the consideration of the severity of the impact and the duration and frequency of such adverse impact, mitigation measures or solution to prevent or abate such impacts to an acceptable level has also been suggested.

Mitigative measures: The ECR suggests several mitigative measures. Many of the suggestions include process alterations rather than end-of-pipe solutions. These include change in raw materials, change of disposal routes or locations, process designing and methods of construction and installation of an Effluent Treatment Plant (ETP). However, the suggestion for changing the project site might not be applicable in case of hydrocarbon exploration projects.

Assessment involves combining environmental losses and gains with economic costs and benefits to produce a complete account to each project alternative. Cost-benefit analysis should include environmental impacts where these can be evaluated in monetary terms.

Documentation is prepared to describe the work done in the EIA. A working document is prepared to provide clearly stated and argued recommendations for immediate action. The working document should contain a list of project alternatives with comments on the environmental and economic impacts.

Decision making on the EIA report:

Approval of the EIA report is one of several requirements that a project should meet. In Bangladesh, the DoE is responsible for the

¹² For more information, see, Bangladesh Centre for Advanced Studies (BCAS), *Guide to the Environmental Conservation Act 1995 and Rules 1997*, Dhaka; Computer Graphics, 1999.

approval of the EIA report of the project. Depending on the type and extent of the project, more than one agency could be responsible for the final approval. At the beginning of the project approval process, the responsible agency ensures that the project proponent is aware of the requirements of the EIA process, and in this process they may refer the proponent to the DoE. Once the DoE has completed its review and made recommendations or suggestions, they are then taken into account in the final decision making process. The degree of co-operation between the DoE and the final project approval agency determine the degree to which potential environmental impacts are taken into account for the final project approval. Since a project can have impacts on different sectors like, social development, public health and economic development, the agencies responsible for these sectors might also be involved in the decision making to raise issues and provide input into the EIA process.

Most projects affect a wide range of people with varied interests. Therefore, it is important to identify significant social and environmental issues through public participation. In order to prepare an effective EIA, issues raised by the public should be taken into account during the project design phase or addressed during the environmental management phase. However, it is important to note that the EIA process in Bangladesh does not require public participation.¹³ In Norway, the Parliament is engaged in **the principal (or final) decision making** on the approval of oil and gas development projects after the approval of the EIA by the relevant Ministry. **The principle (or final) decision** considers a host of conditions regarding many aspects of the project development, e.g. approval of the estimates of production rate, technical solution regarding the type of the platform and treatment processes and how the oil and gas are to be transported to the refinery. Also decisions have to be taken about the conditions the project has to meet to

¹³ ADB, *op. cit*, p. 19.

avoid or to minimise the negative environmental impact.¹⁴ However, the decision-making process in Bangladesh is essentially bureaucratic, without having provisions to engage the Parliament. The Norwegian process of the approval of the project through the parliament, technically, makes it more transparent. In Bangladesh, public inputs on the EIA document and beyond would have added transparency to the process.

3. Oil Exploration in the Sunderbans: An Assessment of its Environmental Effects

Before discussing the possible environmental effects of hydrocarbon exploration, this section attempts to describe the biophysical characteristics and the socio-economic and esthetical importance of the Sunderbans in Bangladesh.

Biophysical characteristics and socio-economic importance of the Sunderbans: In order to maintain the balance between ecology and economic development of a country, scientists suggest that trees or forests should cover at least 25 percent of the total land area of a country. However, according to the Forestry Master Plan and surveys by multilateral donor agencies, only 6 percent of the landmass in Bangladesh is covered by trees or forests.¹⁵ Bangladesh clearly has less than the required amount of forest cover. The Sunderbans is one of the few remaining forests in Bangladesh. It accounts for 51 percent of the total forest area in Bangladesh and occupies an area of 6,017 square kilometres.

The Sunderbans is the largest single tract of mangrove forest in the world. Mangrove trees are especially adapted to grow in salt water. They protect the coastal land from being washed away by waves and storms. A study has found that about 10 percent of the world's tropical cyclones occur in the Bay of Bengal and of those 17

¹⁴ Lakens, *op. cit.*, p. 311.

¹⁵ N. Huda and M. K. Roy, "State of the forests", in Q. I. Chowdhury, *Bangladesh: state of environment report 1999*, Dhaka: Forum of Environmental Journalists of Bangladesh, 1999, p. 177.

percent hit land in Bangladesh.¹⁶ Mangroves in the Sunderbans reduce the impacts of storms and guard against coastal erosion and wave damage. Since the Sunderbans provide protection against frequent cyclones for the Southeastern coastal area of Bangladesh, it is known as the 'Southern Greenbelt'. The Sunderbans provides habitat for a large number of bio-diversity. It provides habitat for fish, crabs, shrimps, dolphins and molluscs in the water, and for many birds, mammals and reptiles on the land. It is the home of 450 remaining Royal Bengal Tigers and three other endangered species of wild cat. It is the largest tiger reserve in the world. A United Nations Environment Programme (UNEP) study identifies 42 species of mammals, 270 species of birds, 35 species of reptiles, 400 species of fishes and 330 species of plants in the forest.¹⁷

The Sunderbans not only provide protection against raging storm, the survival of around one and a half million people depend on the biological diversity of the forest. They collect honey, shell, crab, shrimp, fish, and fuel wood. During 1997-98 Bangladesh earned about US\$500,000 as revenue directly from the Sunderbans.¹⁸ The Sunderbans has been categorised by the government as a 'reserve forest'. Considering the uniqueness and the importance of the forest to Bangladesh, United Nations Educational, Scientific and Cultural Organisation (UNESCO) has declared it as the World Heritage Site. The forest being a significant wild fowl habitat has also been declared as a Ramsar site.

¹⁶ UNDP, FAO, and the Government of Bangladesh, (1995). *Integrated Resource Development of the Sunderbans Reserved Forest*, quoted in A. Nishat, and M. Ullah, 'Natural Disasters, Forests and Environmental Security', available from http://www.iucn.org/themes/fcp/activities/publications/amman_flood.doc [accessed on 20/05/03].

¹⁷ UNEP (United Nations Environmental Programme), (2002). *State of environment Bangladesh 2001*, available from http://www.eapap.unep.org/reports/soe/bangladesh_part1.pdf [accessed on 05/08/02].

¹⁸ M. Ullah and A. Nishat, 'Natural disaster, forest and environmental security', available from http://www.iucn.org/themes/fcp/activities/publications/amman_flood.doc [accessed on 19/09/02]

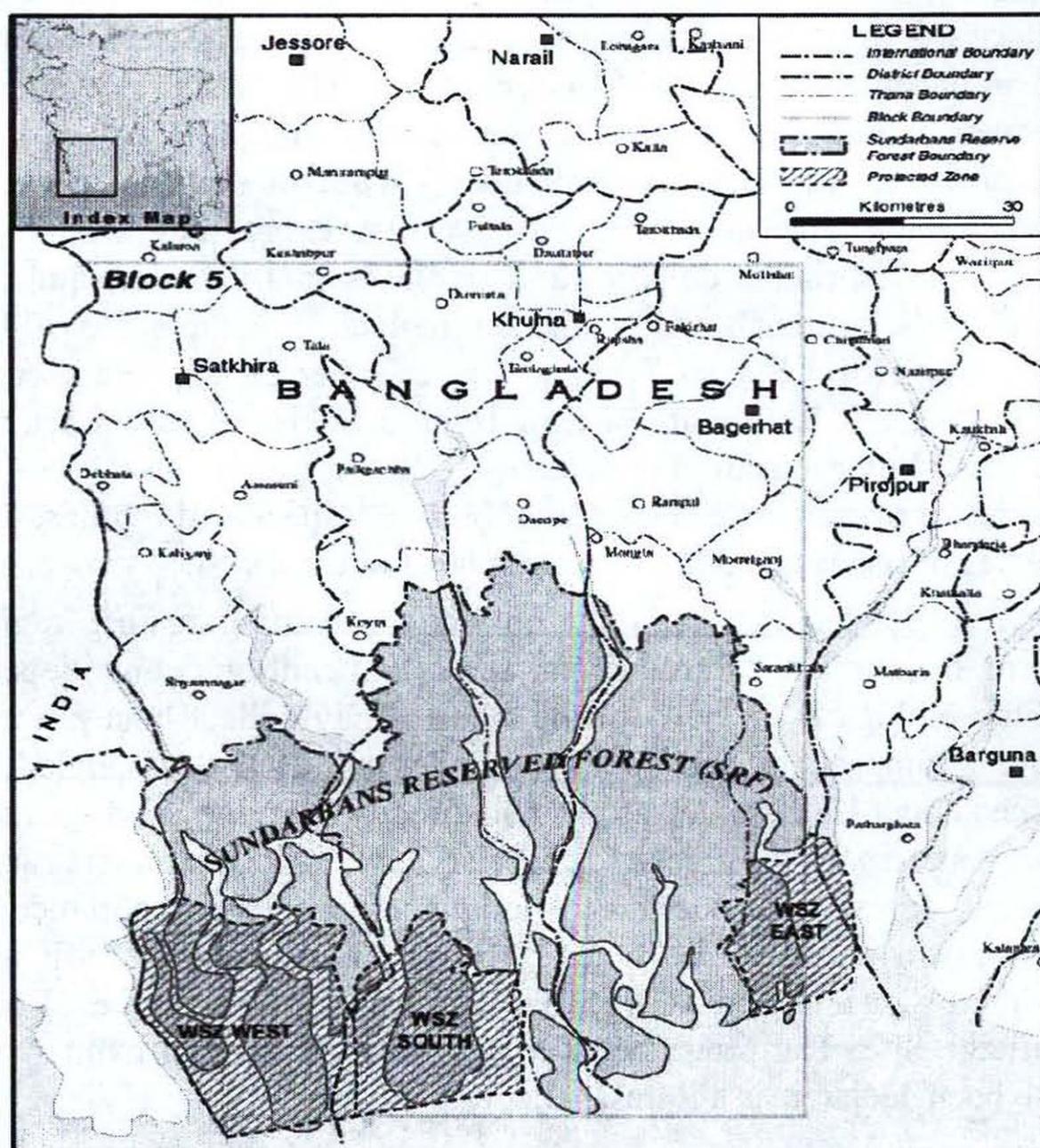


Fig 2: Block 5 and the Sunderbans Reserve Forest.

Source: Shell Hydrocarbon Holdings B. V. (2002) 'Block 5 Location Map'.¹⁹

The oil and gas exploration in the Sunderbans comes in overall context of the country's investment in the energy sector. On 4th July 2001, the Bangladesh government signed the PSC for Blocks 5 with

19. Available from [http://www.shell.com/home/Framework?siteId=bd-en&FC1=&FC2=%2FLeftHandNav%3FLeftNavState%3D4%2C0%2C2&FC3=%2Fbden%2Fhtml%2Fwgen%2Ftodaysissues%2Fsundarbans%2Fblock5locationmap_10181540.html&FC4=%2Fbden%2Fhtml%2Fwgen%2Ftodaysissues%2Fsundarbans%2Fimpulse4.html&FC5=\[accessed on 18/08/02\].](http://www.shell.com/home/Framework?siteId=bd-en&FC1=&FC2=%2FLeftHandNav%3FLeftNavState%3D4%2C0%2C2&FC3=%2Fbden%2Fhtml%2Fwgen%2Ftodaysissues%2Fsundarbans%2Fblock5locationmap_10181540.html&FC4=%2Fbden%2Fhtml%2Fwgen%2Ftodaysissues%2Fsundarbans%2Fimpulse4.html&FC5=[accessed on 18/08/02].)

Shell Hydrocarbon Holdings B. V., Cairn Energy Plc, Bangladesh Petroleum Exploration Corporation (BAPEX) and Petrobangla. The block 5, comprising of 10,985 sq. km., fall within the Sundarbans. Shell and its partner companies have decided not to carryout any exploration activities in the three World Heritage Sites and in the Sunderbans reserve forest area. They also have decided to carryout extensive environmental and social studies before the commencement of any activities. The company plans to start with an environmental and social assessment (ESA) of the area to identify the major environmental and social conditions. The objective is to gather sufficient data to enable the development of a work-scope for a baseline study and to contribute to later development of a more detailed work-scope for an Environmental, Social Impact Assessment (ESIA). The ESA would follow the baseline study and then the impact assessment. Shell plans to carryout the EIA and the SIA by an independent contractor who has both local and international experience. Shell mentions that they have already invested nearly US\$550 million in Bangladesh and promises to make more investments.²⁰ They further mention that their oil and gas development project in the south-western part of the country would not only supply natural gas for that region but will also play a major role in the development of that region. However, the memory of Magurchara blowup and its consequences on the surrounding environment, and the news about the destruction of Mangrove forests by pollution and oil spillage in Nigeria²¹ make environmentalists wary about consequences of the prospects of

²⁰ Shell Hydrocarbon Holdings B. V., (2002). 'Today's issues', available from http://www2.shell.com/home/Framework?siteId=bden&FC1=&FC2=&FC4=&FC5=&FC3=/bden/html/iwgen/todaysissues/sundarbans/faq/sundarbansfaq_10181600.html [accessed on 18/08/02].

²¹ Essential Action, *Oil for nothing: multinational corporations, environmental destruction, death and impunity in the Niger Delta*, 2000, available from www.essentialaction.org/shell/report/intro.html [accessed on 12/08/02].

hydrocarbon exploration even within 25-kilometre radius of the forest.²²

Identification of significant environmental impacts:

Natural environment of each site is different and there is little comparable scientific data available. As mentioned earlier, ecological regions behave in unique ways in response to human interventions. At this stage, it is therefore, difficult to make a prognosis about the environmental impacts of hydrocarbon exploration in the Sunderbans. However, given the fact that it is a mangrove forest area, a general picture of the environmental impacts of oil and gas exploration in similar areas will be discussed in general with implications for the Sunderbans as well.

The development of an oil and gas field passes through a number of phases, and the impacts observed are different in each phase. Erickson²³ lists three types of impacts as direct, indirect and cumulative emanating from projects. Direct impacts are the changes in environmental components and processes that result immediately from the project activity or action. Indirect impacts result from varied interactions of direct impacts and the physical and social environmental components, processes, and conditions that are or may become dynamically linked to those direct impacts. Indirect impact has been found to be more numerous than direct impacts and typically account for most of the EIA efforts. Cumulative impacts are the aggregates of direct and/or indirect impacts resulting from two or more projects in the same area or region. The effects of running more than one project in a particular area, thus, become much higher attaining multi-dimensional nature.

²² Q. I. Chowdhury, *Bangladesh: state of environment report 1999*, Dhaka: Forum of Environmental Journalists of Bangladesh, 1999, p. 237.

²³ P. A. Erickson, *A Practical guide to environmental impact assessment*, London: Academic Press Inc, 1994, p. 9.

It may be mentioned that in Block 5, Shell has planned to carryout geological, aeromagnetic and seismic survey. They have planned to carryout a 6500 km. aerial and 500 km. seismic survey. At a later stage, one exploration well has also been planned.²⁴ All these would have implications for the regions ecology and bio-diversity. It is to be noted that hydrocarbon operations in forest areas inevitably result in both direct and indirect deforestation. Every stage of upstream oil operations – seismic mapping, exploratory and production drilling – requires deforestation. Destruction of forests result in significant loss of bio-diversity as species are pushed to extinction and important ecological services that forests provide such as watershed protection, nutrient recycling, and climate regulations are lost. During the initial exploration stage, seismic surveys are conducted to determine the existence or the location of hydrocarbon reserve. Martin²⁵ notes that during the seismic survey, the process of using low energy sound effect causes little impact on the surrounding environment. International Union for the Conservation of Nature and Natural Resources (IUCN)²⁶ mentions that the aeromagnetic survey is unlikely to conflict with the conservation of mangroves but the use of low flying reconnaissance aeroplanes could destroy the breeding, migration and growth patterns of many sensitive bird species.

After the identification of a prospective structure, a well has to be drilled as the only way to prove the presence of oil and gas. The ecological and social impacts of drilling for natural gas are virtually the same as drilling for oil. During this phase, various construction works ranging from building accommodations for the workers to the construction of platforms takes place. Construction of different facilities is likely to create water, air and noise pollution.

²⁴ Shell, *op. cit.*

²⁵ D. E. Martin, 'The environmental effects of oil and gas production', in, J. Dunderdale (ed.) *Energy & the Environment*, Royal Society of Chemistry: Kent, 1990, p. 195.

²⁶ IUCN (World Union for the Conservation of Nature), *Oil and gas exploration and production in Mangrove areas*, available from <http://biodiversityeconomics.org/pdf/topics-110-00.pdf>, 1993, p. 13.

Once exploratory drilling begins, large amounts of drilling wastes are produced by each well. These wastes come in three types, i.e., produced waters, drilling fluids, and associated wastes. Each drilled well typically results in the production of millions of gallons of produced waters, toxic drilling mud and rock cuttings. Nearly 1,500 to 2,000 tons of toxic drilling mud and cuttings, and millions of gallons of formation waters are produced and discharged every day from each well. These wastes can include toxic material like arsenic, lead and radium-226. These wastes result in the toxic contamination of both surface and ground water and soil. It may be mentioned that drilling wastes in the Gulf of Mexico have smothered ocean-bottom life and created a 5,000 sq. km. 'dead zone'.²⁷ Waste management, such as the re-injection of produced waters, the use of water-based mud, and the installation of closed loop mud systems can make a difference, but these practices are seen as expensive and not widely used by the industry. Martin notes that a number of measures can be undertaken to reduce the impact arising from the use of oil based mud.²⁸ One method is to change the oil phase from diesel to other less toxic highly refined mineral oil(s). This process selectively removes the aromatic hydrocarbon, which does the most damage to the natural environment.

In order to access well sites, pipelines and production stations, new road systems almost inevitably accompany oil and gas development. In addition to the impact of the actual drilling, it has to be considered that the transportation equipment and the machinery (both heavy and light) are likely to alter the ecological setting, as they would create water, air and noise pollution. Roads into fragile and less accessible areas provide a transportation artery for colonisation, logging and other heavy impact activities. According to the World Bank, 400 to 2,400 hectares of land are colonised for each new mile of road built by the oil industry.²⁹ For example, in

²⁷ RAN, *op. cit.*

²⁸ Martin, *op. cit.*, p. 198.

²⁹ G. Ledec, 'Preparing environmental manuals for petroleum exploration and development in tropical forest areas of Latin America and the Caribbean', cited in *Drilling to the ends*

Ecuador, a single oil project resulted in the deforestation of some 2 million hectares of old growth rainforest.³⁰

Marine clay soils in the mangrove forests have the potential to generate acid sulphate. If these soils are exposed to the air (as a result of dredging channels, digging holes, or removal of surface materials), sulphuric acid is released and the pH³¹ of surrounding waters and soils can fall rapidly to below 2.5. Once the acid is liberated, it is extremely difficult and very expensive to reverse the process. The impact of acid drainage on fisheries, irrigation and other activities can be severe and may cause major economic loss, and in extreme cases, abandonment of lands.³² Apart from the surface water contamination, the EIA report of a World Bank financed gas pipeline project mentions of long-term groundwater contamination from the installation of wells.³³

However, the risks of blowout during this period pose the gravest danger to the surrounding natural environment. For example, the US Environmental Protection Agency³⁴ estimated that the fatality rate of accidents in onshore and offshore operations to be at 0.02 per 10^6 tonne of oil produced and 0.18 per 10^9m^3 of natural gas produced. Patin³⁵ notes that drilling accidents are usually associated with unexpected blowouts of liquid and gaseous hydrocarbons from the well as a result of encountering zones with abnormally high pressure. This is more probable in the case of Bangladesh where the

of the Earth: the case against new fossil fuel exploration, 1990, available at <http://www.ran.org/oilreport/ecosystems.html> [accessed on 12/08/02].

³⁰ RAN, *op. cit.*

³¹ A measure of the acidity or alkalinity of a solution.

³² IUCN, *op. cit.*, p. 7.

³³ World Bank, *op. cit.*

³⁴ Environmental Protection Agency (EPA), *Energy/ Environment Fact Book*, quoted in E. E. El-Hinnawi, *The environmental impacts of production and use of energy*, Dublin: Tycooly Press Limited, 1981.

³⁵ S. Patin, 'Accidents during the off-shore oil and gas development', in *Environmental impact of the offshore oil and gas industry*, 1998, available from <http://www.offshore-environment.com/accidents.html> [accessed on 13/08/02].

well pressure is quite high, about 1500-5000 pound per square inch (psi).³⁶ There has already been a major gas blowout in Bangladesh at one of the gas-fields. No other situations but tanker oil spills can compete with drilling accidents in frequency and severity.

The exploration process and the associated developments might turn the region into a 'honey pot' for migration. Given both the population pressure and high level of unemployment rate in Bangladesh, the occurrence of such situation is a possibility. Such migrations might put more pressure on the fragile ecosystem balance of the Sunderbans.

Despite the fact that so far natural gas has been the most significant hydrocarbon resource discovered in Bangladesh, the possibilities of the existence of extractable mineral oil can not be brushed aside. In that case, the chances of procedural or accidental oil spillage are always present. This situation can be catastrophic for the Sunderbans. Studies have found that mangroves cannot easily recover from oil contamination. The exposed trunks or 'breathing roots' of the mangrove become covered with oil that has permeated with marsh mud. This leads to a process of decay and die-off for mangrove trees, and in succession the plant and animal life that depend upon the mangrove structure. For example, such oil spillage in Panama, killed nearly 99 percent of the mussel population, an indicator of the repercussions of the spill felt throughout the ecosystem.³⁷

Most of the environmental impact mitigation strategies are dependent upon the proponent. While working in a developing country, where the regulatory regime is likely to be weaker than the developed ones, it is upon the industry itself that the main responsibility of environmental management falls. Both industry groups and the environmental organisations have developed best

³⁶ *Natural gas utilization in Bangladesh*, available from <http://shakti.hypermart.net/fossil/gas.html> [accessed on 22/09/02].

³⁷ RAN, *op. cit.*

practice guide in order to impose a self-set-standard for environmental management (e.g. IUCN guideline on Oil and Gas Exploration and Production in Mangrove Areas). Such practices have been discarded by critiques as 'publicity/image boosting stunt', without much actual result in the protection of the environment. Environmentalists insist that the oil companies consider their product next to other considerations. Environment protection is always put in place for reason and these reasons should be respected.

4. Regulations Pertaining to Environmental Conservation and EIA in Bangladesh

Bangladesh, as a populous developing country in South Asia, faces numerous environmental threats. Although the severity, source, impact and distribution of environmental problems in Bangladesh might vary, they can be broadly outlined into the following types, i.e., soil degradation, air and water pollution, salinity, management of waste, loss of species or introduction of alien species, deforestation, excessive use of pesticide, herbicide and fertiliser; unplanned urbanisation, desertification, marine pollution and more. Although the sources of most of the problems might be internal, Bangladesh also faces catastrophic environmental problems like, climate change, ozone layer depletion, movement of hazardous waste, depleting fish stock etc. Bangladesh, being a developing country, is more vulnerable to these types of environmental threats as the country's overriding poverty tends to reduce coping capacities to face environmental hazards.

In effect, a number of acts and laws having relevance to pollution control and environment protection were introduced about a century ago.³⁸ After the country achieved independence in 1971, the National Constitution of Bangladesh promulgated in 1972 contains provisions for nature conservation. However, the

³⁸ A. K. Quader, 'Environmental rules and regulations of Bangladesh', available from <http://alochona.org/magazine/2002/february/TOTM4.htm> [accessed on 02/08/02].

Environment Pollution Control Ordinance of 1977 was the first official regulatory framework for the control, prevention and abatement of pollution of the environment. But specific rules, regulations guidelines, and standards against environmental degradation are relatively recent, enacted during and after the 1990s. Several factors like the growing environmental consciousness at the global level, after the Brundtland Commission report (1987), donor pressure to environmental standards in development projects, various environmental laws and regulations under the OECD (1992) and more had the influence in bringing these changes

Bangladesh is a signatory to various international conventions, treaties and protocols regarding environmental conservation. Agenda 21 of the United Nations Conference on Environment and Development of 1992 is one of them. Chapter 39 of the Agenda 21 urged the signatory states to abide by the international legal instruments and to incorporate them in the country's municipal laws for implementation. This clause ushered the way for the enactment of various environmental conservation and protection legislation in Bangladesh. So far, nearly 200 environmental legislations have been enacted.

The Pollution Control Ordinance of 1977 was repealed by the Environment Conservation Act (ECA) of 1995. It has been passed by the Parliament to prevent the escalation of environment pollution in the country and to make the general people and the concerned agencies aware about its implications. The Act provided for the creation of the Department of Environment (DoE) under the Ministry of Environment and Forest (MOEF). A Director General heads the DoE. The DoE has been given the task to continuously monitor the health of the environment in the country and impose regulatory measures on the industrial units, automotive vehicles and other concerned bodies. The Act covers two important issues: Requirement for environmental clearance for establishing industries or undertaking industrial units or projects.

Formulation of environmental guidelines and standards for the control and mitigation of environmental pollution and the conservation and improvement of environment.

The Bangladesh government outlined the National Environmental Management Action Plan (NEMAP) in 1995 with the participation of grass-root level people. It outlines the government's plans for sustainable development. It provides for the sustainable use of natural gas in long time frame. It outlines the following environmental management strategies for the use and exploration of energy:

- Reduce and discourage the use of these fuels that pollute the environment and encourage the use of those fuels that are environmentally sound and less harmful.
- Reduce the use of fuel-wood, agricultural residues, etc. and increase the use of their substitutes for fuel.
- Invent, use and rapidly expand improved technology for saving energy and fuel.
- Conserve the country's existing and renewable sources of energy.
- Conduct EIAs before implementing projects for extraction of fuel and mineral resources.³⁹

Clause (2) (f) of Section 20 of the ECA '95 requires that rules be made to 'evaluate, review the EIA of various projects and activities and procedures be established for approval'⁴⁰ (BCAS, 1999: 43). The Government of Bangladesh has framed the Environment Conservation Rules (ECR) 1997 to meet the requirements of the fore-mentioned section of the ECA '95. Depending on the environmental significance and location, the ECR'97 divides industrial or developmental projects into four categories – Green,

³⁹ NEMAP (National Environmental Management Action Plan), Volume: 2, Dhaka, Bangladesh: Ministry of Environment and Forest, 1995, p. 78.

⁴⁰ BCAS, *op. cit.*, p. 43.

Amber A, Amber B and Red. According to the Rules, any project or development intervention has to obtain environmental clearance in two steps. Firstly, to obtain site or location clearance (based on the application along with necessary paper as required against respective categories, including the Initial Environment Examination (IEE) which will contain the scope of work of the proposed EIA). Secondly, to obtain environmental clearance after the submission of the EIA report and other necessary papers. It might take sixty days for the DoE to issue the sight clearance from the date of receiving the application, another sixty days to approve the EIA and thirty more to issue the environment clearance. However, if the DoE Director General considers appropriate, the rules provide discretionary authority to grant environmental clearance exempting the site or location clearance.⁴¹

The procedure lists the documents to be submitted with the application for each category of industry or project including IEE Report, Effluent Treatment Plan (ETP), EMP, EIA Report and Feasibility Report etc. Among other things, the rule encompasses the following:

- Declaration of Ecologically Critical Areas, and restriction on the operation and process, which can be carried out or cannot be initiated in those areas.
- Procedure for Granting Environmental Clearance
- Setting Environmental Standards for air, water, noise, odour and other environmental components
- Setting waste discharge and emission standards

The EPA of 1995 and the ECR of 1997 have formed the legislative basis for the EIA process. DoE is the regulatory body responsible for the environmental legislation.⁴² Besides ECA '95 and

⁴¹ Chowdhury, *op. cit.*, p. 273.

⁴² Momtaz, *op. cit.*, p. 165.

ECR '97, other significant legislation are: National Environment Policy (1992), National Environment Action Plan (1992), Forest Policy (1994), Forestry Master Plan (1993-2012), draft National Conservation Strategy (1997), Environmental Court Act (2000) etc.

In 1995, the National Energy Policy has been formulated to ensure proper exploration, production, distribution and rational use of energy sources to meet the growing energy demand of different zones, consuming sectors and consumers groups on a sustainable basis. With regards to environment, the Energy Policy seeks to ensure environmentally sound sustainable energy development programmes causing minimum damage to environment. However, it does not explicitly mention about the ways and means to achieve these objectives.

5. An Appraisal of the EIA Process in Bangladesh

In Bangladesh, despite enacting numerous legislations for environmental protection, its implementation remains appalling. For instance, lead concentration in the air of major Bangladeshi cities is several hundred times higher than the UN recommended safe level and the level of arsenic is more than 500 percent of the WHO recommended safe level for over 80 million people.⁴³ Clearly, those impressive arrays of legislation have failed to serve their purpose. Reasons for such failure have been attributed to the legislation processes, which were not grounded on sound basis and workable instruments to realise the intended output. Most of the environmental legislations in Bangladesh are 'Command and Control' type, with no economic incentives for compliance. As Khan observes:

⁴³ Ben-center, 'An array of environmental problems threaten the people of Bangladesh', available from <http://www.ben-center.org/> [accessed on 29/08/02].

The policies/plans sound mission-like, with statement of pious objectives, rather than real directions. Most of the Environmental Action Plans proposed are regulatory in nature. The regulatory regime with almost 200 laws has bearing on the environment, both direct and indirect. The Environmental Court Act is a detailed instrument of control and regulation. But standards and penalties often are not enforceable, efficient and effective in most cases. Reality in Bangladesh speaks for itself.

In Bangladesh, policies/laws are drafted by ministries, vetted by Cabinets and stamped by parliament. There is hardly any substantive debate yet on environment in Parliament. But policy making is a political process entailing costs and politicians are in a better position to distribute cost benefits among electorates. Public inputs beyond parliament into policy-making are not yet a substantive phenomenon.⁴⁴

It should be kept in mind that while many Western countries, like the USA, have introduced EIA regimes in the 1970s, the evolution of EIA regime in Bangladesh is comparatively new, which has been introduced only during the second half of the 1990s. Moreover, given Bangladesh's economic, technological and institutional capabilities, it would be unrealistic to equate the EIA regime of a Third World country with that of the developed ones. Meanwhile, the country faces few problems with respect to EIA as below.

Lack of comprehensiveness: Tendencies on part of both the EIA regulatory agencies and the project proponent to treat EIA report as a confidential document makes it difficult for researchers and the public to access information on any particular EIA. However, with a view to provide an insight into the Impact Assessment procedure in

⁴⁴ M. R. Khan., 'Greening Bangladesh: a green policy-management framework', *The Daily Star* (Dhaka), June 1, 2001.

Bangladesh, an EIA report of an Asian Development Bank (ADB) funded combined cycle power station in Bangladesh has been studied.⁴⁵ The EIA study surveys impacts of waste disposal, transportation, air quality, socio-economic, ecological and acoustic impacts during the construction and operational phases of the project. With few exceptions, like the survey of noise level, the study was not based on a comprehensive survey. It drew inferences from other similar and surrounding areas, like the description on local flora and fauna and the bio-diversity. Many important aspects have been overlooked or have not been considered properly (e. g. the impact of water intake and discharge on the fish and other waterborne creatures in the nearby river). Impact from some of the developments did not get their requisite attention in the report. For example, the impact of road construction to the project site was predicted to be smaller whereas the impact is likely to be high in a rural and agricultural area. Cumulative impacts emanating from different activities within the project have not been considered. The study looks into socio-economic impact of the project on the surrounding areas. It discusses the benefits that the people might get from the development in terms of employment creation, boost for the local economy by the migrant workers and fresh water supply. However, the impact of the migrant workers on the local society has not been dealt with proper breadth. Although the report planned to integrate local public opinion regarding compensation payment for land acquisition, the disaster management plan of the project does not mention of any public awareness programmes about the measures that should be undertaken in case of an emergency situation in the plant site. Most importantly, the report only deals with the impacts that might emanate from the development of the project but it mentions neither about the impact mitigation measures nor deals with the issues of environmental management.

⁴⁵ ADB (Asian Development Bank), *Summary environmental impact assessment: Meghnaghat power project in the Peoples Republic of Bangladesh*, 1997, available from www.adb.org/Documents/Environment/Ban/ban-meghnaghat.pdf [Accessed on 12/03/03]

Short-term view: An industry or a project usually undergoes three broad phases: construction, operation and decommissioning. The completion of these three phases normally takes substantially long time, maybe more than a decade. Critiques have identified that one of the major shortcomings of the EIA is that it tends to take a rather short-term view of the impacts. Such 'snapshot' views fail to register the cumulative effects that might emanate from the project over time. Apart from taking a short-term view of impacts during the completion of the phases, most EIA documents do not conduct studies on the impacts of possible disasters (e. g. blowups during hydrocarbon explorations or toxic gas leakage during industrial operations). Most EMPS do not have a backup plan to tackle the environmental impacts of such disasters. Moreover, provisions are not usually met to tackle impacts from the projects that might arise in distant future (e.g. the use of tube-well and arsenic contamination of groundwater in Bangladesh). Moreover, an EIA document is a subjective judgement involving 'number-crunching'. However, Barrow⁴⁶ argues that such quantification may hide original data or chain of analysis. Excessive quantitative documentation might make it difficult for general people to understand.

Question about objectivity: The strength of the legal mandate has been termed to be the country's commitment to an effective EIA system. The institutional framework of that EIA system (e.g. laws, regulations, policies and agencies) is designed to contribute to the conservation and protection of the environment. In Bangladesh, like in many other countries, the project proponent has been delegated the responsibility of conducting the EIA. They usually hire firms that would carryout the IEE, EIA or SIA. This process of hiring EIA consultant firms for the production of the EIA report by the proponent organisation puts the objectivity of the final report into question. Momtaz⁴⁷ observes that the proponent agencies intention is to get an EIA done that will highlight the benefits and justify the

⁴⁶ C. J. Barrow, workshop note on *Environment policy and impact assessment*, 2002, p. 4.

⁴⁷ Momtaz, *op. cit.*, p. 175.

proposal in order to obtain environmental clearance from the DoE.... It is therefore the job of the consultants to satisfy the proponent's requirements rather than carrying out objective EIAs to ensure environmental and social soundness of projects. In addition, there are no codes-of-conduct by which the activities of the consultants are governed. So, the EIA legislation in Bangladesh has to be reviewed in order to strengthen the institutional capabilities for conducting an independent EIA. Codes-of-conduct for the EIA consultants should also be developed by the DoE. Lessons from some developed countries (e.g. the Australian state of Western Australia) can be helpful in this regard.

Lack of skilled manpower: While legislation has been identified as one of the major impediments towards conducting an effective EIA, the other option should have been the development of manpower within the governmental regulatory body capable of carrying out an independent EIA as well as monitoring the environmental management programmes undertaken by the project proponent. Numerous studies have found a lack of skilled EIA and SIA professionals within the DoE. Administrative and financial reasons are responsible for such deficiency. Most of the officials at DoE have a relatively short period of stay for 3 to 5 years in the office. As a part of the administrative procedure, they are transferred to other ministries and vice versa. This short tenure of the officials not only hampers skill building but also undermines the stability, continuity and implementation of various policies. The preparation of an effective independent EIA and the subsequent monitoring process is an expensive exercise. The DoE in a least developed country like Bangladesh is not a well-funded organisation. Chronic budgetary constraints hamper the training of manpower for the preparation and monitoring of EIA. This has left the DoE short of properly trained manpower and equipment. DoE officials have also admitted such limitations and mentioned that the Department is not

equipped with requisite staff, both in number and expertise.⁴⁸ These impediments in skill building have been identified by the World Bank as the biggest constraint to effectively implement EIAs.⁴⁹

Lack of effective enforcement and implementation system: Legislations only become meaningful when they are supported by effective monitoring system. As mentioned in the earlier chapter, environmental law and the practice of environmental protection in developing countries are often described as rule oriented and poorly implemented and enforced. The reasons are mainly fragmentation of legal basis for action, lack of co-ordination between environmental and sectoral government agencies, and deficiencies in personnel skills and material requirements.⁵⁰ It may be mentioned that the administrative structure in Bangladesh is typically organised vertically into sectoral or functional ministries and departments. The horizontal linkage among ministries is weak. As a result, complex environmental problems requiring holistic approach receive uncoordinated partial treatment by overlapping ministries, which often tend to treat symptoms as problems. The problem has been further compounded in the bio-diversity conservation area where various resources are being managed by different sectoral ministries. Any development project undertaken by a relevant ministry has substantial impact on the other.

DoE do not have structural upper hand over other government agencies. It can only co-operate with other government agencies but cannot oblige others to co-operate with it. In certain cases, it largely plays a role in seeking compliance with environmental laws. Out of

⁴⁸ B. Alam, 'Power plants: environmental impact assessment (EIA)', in Q. I. Chowdhury, *Bangladesh: state of environment report 1999*, Dhaka: Forum of Environmental Journalists of Bangladesh, 1999, p. 157.

⁴⁹ R. Goodland and J. Mercier, *The Evolution of environmental assessment in the World Bank: from "approval" to results*, cited in S. Momtaz 'Environmental impact assessment in Bangladesh: a critical review', *Environmental Impact Assessment Review*, Vol. 22, No. 2, 1999, pp. 163-179.

⁵⁰ Khan, *op. cit.*

three major institutions dealing with industries, it has been found, only the Board of Investment co-operates with the DoE by requiring entrepreneurs to obtain environment clearance certificate from DoE as a condition precedent for operation permission.⁵¹ The effect of such administrative feebleness had its manifestation in case of Magurchara disaster. In that case, the Occidental Ltd., the operating company, had applied for the required clearance and had submitted an EIA report to the DoE. Officials of the department had given their comments on it and had asked for the fulfilment of certain conditions. The company, however, did not reply nor collected the mandatory environmental clearance certificate and went ahead with the exploratory activities without any trouble.⁵² The situation is further complicated by the higher rate of corruption in the country. Bangladesh Chemical Industries Corporation (BCIC), who undertakes EIA projects on behalf of the proponent, has reportedly complained that project proponents prefer bribing the DoE to get the environment clearance certificate rather than going through the expensive process of undertaking the EIA.

In this respect, Prof. Nurul Islam of Institute of Appropriate Technology, BUET, Dhaka mentions during a personal interview, 'There certainly have been environmental impacts of energy exploration in Bangladesh (e.g. the distribution of radioactive drilling mud) but the lack of proper implementation and monitoring authority has apparently kept it invisible.' According to the knowledge of the author there has not been any independent studies done to assess the environmental impacts of the hydrocarbon exploration projects on the surrounding environment.

⁵¹ L. A. Siddiqui, 'Implementation of global environmental treaties in Bangladesh', *BISS Journal*, Vol. 21, No. 3, 2000, pp. 320-343.

⁵² M. Islam, 'Magurchara gas disaster', available from <http://shakti.hypermart.net/articles/petro/mazhar1.htm> [accessed on 30/08/02]

Misperception about the requirement of EIA: The requirements for IEE, EIA or SIA, in Bangladesh, are seen as nothing more than the rise of extensive paperwork. The general perception is that EIAs are conducted only because they are required by the government legislation but not to ensure sustainability of project or for the development of better management plans. Not surprisingly, some of the proponents view EIA as an impediment to the implementation of their industries or projects.⁵³

EIA being used as a planning tool rather than a decision making tool: EIA has not been used as a decision making tool to determine the acceptability of a project on the grounds of its environmental cost. On the contrary, it has been used as a planning tool to minimise the adverse impact of a project. A review of more than 1,000 EIA documents in Thailand and Philippines by Biswas and Agarwal⁵⁴ show that none were denied clearance on environmental grounds. Given the weak EIA regulatory regime in Bangladesh, the situation could be the same or even worse.

Weakness in coordination among the professional groups: Biswas and Agarwal⁵⁵ observe that EIA processes were initiated only when the project preparation is near completion. During this phase, there is a visible weakness in the co-ordination in the EIA procedure and project cycle. This vacuum is widened by situations when the environmentalists and the project engineers do not communicate with each other. Depending on the prominence of the professional groups in the EIA team, the report can be unbalanced of having too much analysis about environmental impacts without actual references to the operational impacts or on the operational procedures of the project without much analysis of the environmental impacts of it. Moreover, during the phase between the

⁵³ Momtaz, *op. cit.*, p. 175.

⁵⁴ A. K. Biswas and S. B., Agarwala, *Environmental impact assessment of developing countries*, Butterworth Heinemann, Oxford, 1994, p. 19.

⁵⁵ *Ibid.*

awarding of a job and the conduction of the EIA, the company invests money in to select locations. This puts pressure on the EIA firm to highlight the positive impacts instead of being objective.

EIA lacking elaborate environment management plan: Biswas & Agarwala⁵⁶ mention that the EIA has been used in many developing countries to be an end rather than a means to ensure better environmental protection. Endorsement of the impact assessment appears as the final activity. During their study, they found only a few statements dealing with environmental management and most of the research has been concentrated on impact identification and evaluation. Such absence of proper EMP has been observed while reviewing the fore-mentioned EIA report of the power project in Bangladesh.

In the light of above discussions, it seems that it is not possible to ensure sustainable development in Bangladesh with the current EIA regime. Although the ECA'95 and the ECR'97 have laid the basis for the EIA process and the guideline was to provide direction to achieving it, it has not been supported by effective enforcement and monitoring regime. Therefore, it is used not as a tool for integrative planning but for *ad hoc* planning. The results of such negligence have already proven to be of too high for the country. It has been mentioned earlier that the blow out at one of the exploratory well of Occidental Corporation not only had its toll through the depletion of the natural resources, it also caused devastation on the surrounding natural environment and on the livelihood of the people of the surrounding area. Such a situation resulting from an inefficient EIA report and, inadequate EMP and contingency plans along with improper monitoring would be several time more disastrous in the case of possible explorations in the ecologically sensitive areas of the Sunderbans. Therefore it is not merely desirable but essential to have an effective EIA regulatory,

⁵⁶ *Ibid.*

implementation and monitoring regime to help minimise such devastation.

6. Concluding Remarks

EIA is not a purely technical exercise although it is strengthened by adherence to the rules and systemic rigour of science. EIA includes the decision on the governance of resources and the allocation of costs and benefits within the society, the decision being essentially a political process.⁵⁷ Apart from this, institutional arrangement for EIA in a particular country is shaped by the distribution of power and functions between different tiers of government and the complex interplay of political interests they represent.⁵⁸ Therefore, both the institutional structure and the decision making on the EIA report are political processes in themselves.

Technically, EIA documents are one of the tools that help decision-makers to take decisions for granting permission to IOCs for the exploration and development of hydrocarbon resources. However, in most cases, the governmental decision seems to be shaped by domestic and international politics. Perhaps, it would not be wrong to state that one aspect of the PSCs and the subsequent decisions on hydrocarbon exploration and development in Bangladesh is its lack of adequate transparency. The decision to award the PSCs to the IOCs and the terms and conditions set in the contract is a political process. There is no public involvement during this process and the PSCs are branded as confidential documents. Concerns about transparencies become greater when newspapers report about pressure from the IOCs on the government. The news,

⁵⁷ Smith, *op. cit.*, p. 186.

⁵⁸ P. A. Memon, 'Devolution of environmental regulation: environment impact assessment in Malaysia', *Impact Assessment and Project Appraisal*, Vol. 18, No. 4, 2000, pp. 283-293.

although, may not always be true or could be exaggerated, but the IOCs who muster wealth far greater than the GDP of Bangladesh certainly are capable enough to put substantial political pressure on the government. For example, there are reports of letters from the former US Energy Secretary, Bill Richardson, to the Bangladesh government requesting the latter for the extension of contracts with Occidental.⁵⁹ Previously, keeping the Magurchara disaster in mind, the Bangladesh government refused to extend the contract with the company. Whatever might be the truth of the report, the fact remains that despite Occidental's responsibilities in the blowout, Bangladesh government extended the contract. Evidently, events of such type seem to give credibility to the reports by the media. Lack of transparency has caused concern among the public and there are fears about the sell-out of national interests to the IOCs.⁶⁰ Also lack of transparency, by all means, impedes the environment conservation efforts of the country.

Based upon the EIA report, the conditions that might be applied on a project can be influenced by international market conditions as well. If the price of a certain industrial commodity or mineral resource goes up in the international market, it is likely that the EIA regulatory regimes, acting as a part of the governmental structure, would act to keep the conditions relaxed enough to facilitate the swift initiation of the industry or the project. For example, high price of hydrocarbon in the international market creates enough incentives for the government of a foreign-currency-starving country like Bangladesh for the quick initiation of hydrocarbon exploration projects. In such case, it seems more likely that the government would keep the EIA conditions relaxed and flexible as possible. There are instances where the government agencies have instructed

⁵⁹ Drillbits & Tailings, 'Clinton/Gore administration backs Occidental Petroleum (part – 2), Vol. 5, No. 9, 2000, available from

http://www.moles.org/Project/Underground/drillbits/5_09/2.html

⁶⁰ K. A. S. Murshid and A. Wiig, 'A review of development trends in the energy sector of Bangladesh', Chr. Michelsen Institute Report: 3, Bergen, 2001, pp. 36-37.

the project proponents to violate the EIA findings. Alam mentions about one specific case where a private developer was asked by the government agency to violate the EIA findings for the construction of 360-megawatt power plant.⁶¹ The same is the case with one of the developers of a private export processing zones in the country, who was asked to overlook the EIA report of the project on river administration.

In many projects, there is a tendency among project proponent(s) to overemphasise the economic benefits of the project. The purpose is to float the impression that economic development even in the ecologically sensitive regions has intrinsic merit: that the benefits of industrialisation and resource exploitation are imperative and of sufficient inherent value to outweigh any costs involved in any such circumstances.⁶² Human greed is, therefore, by far the greatest cause of environmental degradation. It has different expressions in different regions, culture and time. Therefore, one of the objectives of EIA should be to find an answer to the question: is the project warranted by the larger goal of national interest or by ulterior individualistic and acquisitive objectives of the proponent(s).

In order to attain short-term economic benefits, governments take a 'pollute now, clean later' approach. However, it is important to realise that such actions do not, in the long run, help the development of the country, as the accumulated bills to clean up the environment could be much higher in the future. On the contrary, such acts hinder the developmental processes. In the final analysis, it should be mentioned that development with long-term sustainability can both be achieved and guaranteed once the EIA process is strengthened and carried out with firm conviction.

⁶¹ Op. cit., p. 153.

⁶² Smith, *op. cit.*, p. 127.