

## SESSION 13

### National Legal Policy/ Framework/ Processes

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## **1. Environment Impact Assessment (EIA)**

### **1.1. What is EIA?**

Environmental Impact Assessment (EIA) is used to identify and assess the environmental and social impacts of any proposed major activity (project, plan, programme or policy)<sup>1</sup> prior to its implementation. It aims to predict environmental impacts at an early stage in project planning and design, find ways and means to reduce adverse impacts, shape projects to suit the local environment and present the predictions and options to decision-makers.

EIA is anticipatory, participatory, and systematic in nature and relies on multidisciplinary input. It is a means to assessing the present state of health of ecosystem where project would be executed and to work out the possible impact it could bring in course of the time. By using EIA both environmental and economic benefits can be achieved, such as reduced cost and time of project implementation and design, avoided treatment/clean-up costs and impacts of laws and regulations.

The phrase Environmental Impact Assessment comes from Sec. 102 (2) of the National Environmental Policy Act (NEPA), 1969, USA. In many European countries, it came into vogue with the introduction of the concept of sustainable development after the World Commission of Environment in 1987. EIA has now become a requirement in many countries. In India, EIA came into existence around 1978-79; though, it was made mandatory only in 1994.

EIA has two roles, namely, legal & educational. The legal role of EIA ensures that development projects such as a housing estate, a road/bridge or some such construction project has a minimal impact on the environment in its entire 'lifecycle', i.e. during design, construction, use, maintenance, and demolition. Many countries now have laws stipulating that unless an EIA study is carried out (particularly for large infrastructure projects); permission for construction will not be granted by the local authority. The educational role of EIA is equally important. EIA facilitates in educating everyone involved - professionals and users included, of the potential environmental impacts of a project.

Various guidelines are available on EIA. The main steps are as follows:

Preliminary activities include the selection of a coordinator for the EIA and the collection of background information. This should be undertaken as soon as a project has been identified.

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<sup>1</sup> For the sake of brevity, hereafter, the term 'project' will be used in place of 'any major activity'. The term must be deemed to include 'any project, plan, program or policy'.

Impact identification involves a broad analysis of the impacts of project activities with a view to identifying those which are worthy of a detailed study.

Baseline study entails the collection of detailed information and data on the condition of the project area prior to the project's implementation.

Impact evaluation should be done whenever possible in quantitative terms and should include the working-out of potential mitigation measures. Impact evaluation cannot proceed until project alternative has been defined, but should be completed early enough to permit decisions to be made in a timely fashion.

Assessment involves combining environmental losses and gains with economic costs and benefits to procedure 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 alternative with comments on the environmental and economic impacts of each.

Decision-making begins when the working document reaches the decision maker, who will either accept one of the project alternatives, request further study or reject the proposed action altogether.

Post audits are made to determine how close to reality the EIA predictions were.

## **1.2. Need of EIA**

Every anthropogenic activity has some impact on the environment. More often it is harmful to the environment than benign. However, mankind as it is developed today cannot live without taking up these activities for his food, security and other needs. Consequently, there is a need to harmonise developmental activities with the environmental concerns. EIA is one of the tools available with the planners to achieve the above-mentioned goal.

It is desirable to ensure that the development options under consideration are sustainable. In doing so, environmental consequences must be characterised early in the project cycle and accounted for in the project design.

The objective of EIA is to foresee the potential environmental problems that would arise out of a proposed development and address them in the project's planning and design stage. The EIA process should then allow for the communication of this information to:

- (a) The project proponent;
- (b) The regulatory agencies; and,
- (c) All stakeholders and interest groups.

EIA integrates the environmental concerns in the developmental activities right at the time of initiating for preparing the feasibility report. In doing so, it can enable the integration of environmental concerns and mitigation measures in project development. EIA can often prevent future liabilities or expensive alterations in project design.

EIA is integral part of environmental planning and management. It starts from the planning stage of the project and is carried on throughout its implementation, operation and final closure. For example, establishment of an industry requires proper choice of location and technology at the planning stage to keep the environmental damage well within the acceptable limit like minimum deforestation, displacement of people and pollution. Similarly care has to be taken to abate any environmental damages like air and noise pollution, insanitation and social problems due to migrant labor during the construction phase. When the factory operates all steps are required to be taken for prevention and control of air, water and soil pollution by technology control and installation of appropriate effluent or emission treatment plant. Finally the unavoidable solid waste generated from the industry (e.g. mine over burden & fly ash) has to be disposed of in an environmentally benign manner like properly rehabilitating the disposal site. Similar land rehabilitation is required when the industry is finally closed and dismantled after completion of its useful life (e.g. mine closure).

Any development project is taken up with the aim of providing net economic and social benefits to the people. Economic benefits like increased production of goods and services, increased per capita income, foreign exchange earnings etc., are tangible ones, There are also some negative socio-economic costs of the project at least on some section of population, like loss of livelihood of the project effected people and increased disparity of incomes which are not easily noticed and not taken into consideration in the decision making process. Simultaneously the project can have both beneficial and adverse environmental impacts. The negative impact includes- pollution, deforestation, soil erosion etc. The losses incurred on the account of the adverse environmental and social impacts are intangible ones. A

project should be decided on the basis of cost benefit analysis, taking into consideration both tangible and intangible losses and gains.

A few decades ago, environmental impacts were not taken into consideration into deciding upon a project; only the techno-economic feasibility was considered relevant. Today it is felt that the techno economic feasibility should be integrated with the environmental compatibility to make the developmental project sustainable. An EIA serves the purpose of the above notion. EIA is a part of the decision making process. It must be therefore, carried out before the final decision is taken about any project. Hence it can not be considered as a post decision activity. If it is considered merely as only a regulatory requirement by the project proponents, such an attitude most defiantly defeats the very purpose of EIA.

## 2. The basic EIA process

The stages of an EIA process generally depend on the requirements of the country. However, most EIA processes have a common structure, whose application is a basic standard of good practice.

EIA usually consists of eight steps with each step equally important in determining the overall performance of the project. Typically, the EIA process begins with screening to ensure that the time and resources are directed at the proposals which matter environmentally and ends with some form of follow up on the implementation of the decisions and actions taken as a result of an EIA report. The eight steps of the EIA process are presented in brief below:

- **Screening:** First stage of EIA, which determines whether the proposed project, requires an EIA and if it does, then the level of assessment required.
- **Scoping:** This stage identifies the key issues and impacts that should be further investigated. This stage also defines the boundary and time limit of the study.
- **Impact analysis:** This stage of EIA identifies and predicts the likely environmental and social impact of the proposed project and evaluates the significance.
- **Mitigation:** This step in EIA recommends the actions to reduce and avoid the potential adverse environmental consequences of development activities.
- **Reporting:** This stage presents the result of EIA in a form of a report to the decision-making body and other interested parties.
- **Review of EIA:** It examines the adequacy and effectiveness of the EIA report and provides the information necessary for decision-making.
- **Decision-making:** It decides whether the project is rejected, approved or needs further change.
- **Post monitoring:** This stage comes into play once the project is commissioned. It checks to ensure that the impacts of the project do not exceed the legal standards and implementation of the mitigation measures are in the manner as described in the EIA report.

### **3. EIA process in India**

#### **3.1. Introduction**

EIA has more of a legal role to play in Indian context rather than the educational one. It is backed by the environmental protection act 1986. The MoEF has prepared Environmental Guidelines, to help the project proponents of a developmental project to work out an EIA. Guidelines have been prepared to bring out specific information on the environment required for environmental clearance. The agencies, which are primarily responsible for the respective sectors are closely involved in preparing the guidelines. River valley projects, thermal power projects, mining projects and industries, ports and harbours, development of beaches, highway/ railroad projects are the sectors for which guidelines have already been prepared. These guidelines basically consist of aspects regarding planning and implementation of development projects. The majority of projects in India, which require EIA's, are large developmental projects like nuclear power, river valley, thermal power plants etc, where government plays an important role.

MoEF has developed guidelines for the preparation of EIA reports along with questionnaires and check lists for the different sectors like industry and mining projects, thermal power projects, river valley projects, road, highways and railway projects port and harbours, airports, communication projects and new towns. The critical issues focused in all these guidelines are:

- Can the local environment cope with the additional waste and pollution that the project will produce?
- Will the project location conflict with the nearby land use or preclude later developments in surrounding areas?
- Can the project operate safely without serious risk of accidents or long-term health hazards?
- How will the project affect economic activities that are based on natural resources?
- Is there sufficient infrastructure to support the project?
- How much of the resources (such as water, energy etc) will the project consume, and are adequate supplies of these resources available?
- What kind of human resources will it require or replace and what will be its social impacts in the short/long-run?
- What damages will it inadvertently cause to the national/regional assets such as natural resources, tourist areas, or historic or cultural sites, etc? (UNEP 1988).

The EIA process in India is made up of the following phases:

1. Screening
2. Scoping and consideration of alternatives
3. Baseline data collection
4. Impact prediction
5. Assessment of alternatives, delineation of mitigation measures and environmental impact statement
6. Public hearing
7. Environment Management Plan
8. Decision making
9. Monitoring the clearance conditions

Each of these processes have been explained in detail.

### **1. Screening**

Screening is done to see whether a project requires environmental clearance as per the statutory notifications. Screening Criteria are based upon:

- Scales of investment;
- Type of development; and,
- Location of development.

A Project requires statutory environmental clearance only if the provisions of EIA notification and/or one or more statutory notification mentioned below cover it.

Prohibiting location of industries except those related to Tourism in a belt of 1 km from high tide mark from the Revdanda Creek up to Devgarh Point (near Shrivardhan) as well as in 1 km belt along the banks of Rajpuri Creek in Murud Janjira area in the Rajgarh district of Maharashtra (6<sup>th</sup> January 1989)

Restricting location of industries, mining operations and regulating other activities in Doon Valley (1<sup>st</sup> February 1989)

Regulating activities in the coastal stretches of the country by classifying them as coastal regulation zone and prohibiting certain activities (19<sup>th</sup> February 1991)

Restricting location of industries and regulating other activities in Dahanu Taluka in Maharashtra (6<sup>th</sup> June 1991)

Restricting certain activities in specified areas of Aravalli Range in the Gurgaon district of Haryana and Alwar district of Rajasthan (7<sup>th</sup> May 1992)

Regulating industrial and other activities, which could lead to pollution and congestion in an area north west of Numaligarh in Assam (5<sup>th</sup> July 1996)

## **2. Scoping and consideration of alternatives**

Scoping is a process of detailing the terms of reference of EIA. It has to be done by the consultant in consultation with the project proponent and guidance, if need be, from Impact Assessment Agency.

MoEF has published guidelines for different sectors, which outline the significant issues to be addressed in the EIA studies. Quantifiable impacts are to be assessed on the basis of magnitude, prevalence, frequency and duration and non-quantifiable impacts (such as aesthetic or recreational value), significance is commonly determined through the socio-economic criteria. After the areas, where the project could have significant impact, are identified, the baseline status of these should be monitored and then the likely changes in these on account of the construction and operation of the proposed project should be predicted.

## **3. Baseline data collection**

Baseline data describes the existing environmental status of the identified study area. The site-specific primary data should be monitored for the identified parameters and supplemented by secondary data if available.

## **4. Impact prediction**

Impact prediction is a way of 'mapping' the environmental consequences of the significant aspects of the project and its alternatives. Environmental impact can never be predicted with absolute certainty and this is all the more reason to consider all possible factors and take all possible precautions for reducing the degree of uncertainty.

The following impacts of the project should be assessed:

- **Air**  
Changes in ambient levels and ground level concentrations due to total emissions from point, line and area sources  
Effects on soils, materials, vegetation, and human health
- **Noise**  
Changes in ambient levels due to noise generated from equipment and movement of vehicles

- **Effect on fauna and human health**
- **Water**
  - Availability to competing users
  - Changes in quality
  - Sediment transport
  - Ingress of saline water
- **Land**
  - Changes in land use and drainage pattern
  - Changes in land quality including effects of waste disposal
  - Changes in shoreline/riverbank and their stability
- **Biological**
  - Deforestation/tree-cutting and shrinkage of animal habitat.
  - Impact on fauna and flora (including aquatic species if any) due to contaminants/pollutants
  - Impact on rare and endangered species, endemic species, and migratory path/route of animals.
  - Impact on breeding and nesting grounds
- **Socio-Economic**
  - Impact on the local community including demographic changes.
  - Impact on economic status
  - Impact on human health.
  - Impact of increased traffic

## **5. Assessment of alternatives, delineation of mitigation measures and environmental impact statement**

For every project, possible alternatives should be identified and environmental attributes compared. Alternatives should cover both project location and process technologies. Alternatives should consider 'no project' option also. Alternatives should then be ranked for selection of the best environmental option for optimum economic benefits to the community at large.

Once alternatives have been reviewed, a mitigation plan should be drawn up for the selected option and is supplemented with an Environmental Management Plan (EMP) to guide the proponent towards environmental improvements. The EMP is a crucial input to monitoring the clearance conditions and therefore details of monitoring should be included in the EMP.

An EIA report should provide clear information to the decision-maker on the

different environmental scenarios without the project, with the project and with project alternatives. Uncertainties should be clearly reflected in the EIA report.

## **6. Public hearing**

Law requires that the public must be informed and consulted on a proposed development after the completion of EIA report.

Any one likely to be affected by the proposed project is entitled to have access to the Executive Summary of the EIA. The affected persons may include:

- *bonafide* local residents;
- local associations;
- environmental groups: active in the area
- any other person located at the project site / sites of displacement

They are to be given an opportunity to make oral/written suggestions to the State Pollution Control Board.

Involvement of the public is one of the fundamental principles of a successful EIA process. It not only provides an opportunity to those directly affected by a project to express their views on the environmental and social impacts of the proposal but also brings about transparency in the environmental clearance system. Nearly all EIA systems make some sort of provision for public involvement. This could be in the form of public consultation (or dialogue) or public participation (which is a more interactive and intensive process of stakeholder engagement).

Most EIA processes are undertaken through public consultation rather than participation. Public consultation refers to the process by which the concerns of the local people regarding the adverse impacts of a project are ascertained and taken into account in the EIA study. This concept was legally introduced in India in the form of 'public hearing' in 1997. Since then the public hearing process has been conducted as a mandatory step of environmental clearance for most projects and activities.

The public consultation process ensures an equitable and fair decision-making process resulting in better environmental outcomes. The type of consultation, whom to consult during EIA activities, when and how to do so and who should do it all vary significantly from project to project. This depends on the needs of the project. However, it is an important component for all kinds of project. This is because public consultations help allay the concerns of the local community, and reduce inaccurate information in the EIA report. Some argue that it is better not to include the public in EIA as it will be quicker and most cost-effective to exclude

the public in EIA. Project proponents eager to implement their project may fear that citizen involvement will delay their schedule or force them to revise the project. Public participation may also be sometimes regarded as unnecessary because citizens lack project-specific expertise and it is just necessary to educate citizens about the merits of the project. To the project proponent, it may look more prudent to push the project through quietly rather than run the risk of a public process. However, excluding the public does not ensure expediency either. Alienated citizens tend to delay the implementation of the project through time consuming legal action if they feel that their rights are curbed through project implementation (example Silent Valley, Tehri Dam, Dahanu). Therefore, the project proponent needs to consider not only the risks but also not refrain from including citizen input so as to reap the potential benefits of establishing a long term co-operative relationship with citizens.

Ideally public consultation should start from when the idea of the project is conceived and continue throughout the course of the EIA. The five main stages when public involvement can take place in the EIA process are screening, scoping, impact analysis and mitigation, review of EIA quality, and implementation and follow up.

In India, the role of the public in the entire environment clearance process is quite limited. Public consultation happens at a very late stage when the EIA report is already prepared and the proponent is about to present it to the review committee for clearance. This means that the EIA study is unable to take into account the concerns and issues important to public. Even if the members of the community raise certain issues in the public hearing process, they have no means of knowing if it actually gets addressed in the final EIA report as they have no access to it. There are several weaknesses in the public hearing process as it exists now. Instead of becoming a participatory forum it has become a mere procedure.

The EIA Notification, 2006 contains very less about the entire public hearing process. It has even added a provision which makes it possible to completely forego the public hearing process if the situation is not conducive for conducting hearing as felt by the local administration. This provision can be misused to further limit the role of the public in the entire process.

There have been several cases in the past that have shown that the public hearing process has failed to meet its objective of effectively involving people in the clearance process. Several means have been devised to keep the public away such as poor circulation of notice, politics, etc. Some cases of poor public hearing proceedings are the Teesta Low Dam Project III and IV, the Sethusamudram ship canal project, the Subansiri Hydroelectric Project, *etc.*

## **7. Environment Management Plan**

The Environment Management Plan (EMP) is prepared by the Impact assessment authority after all the above provisions have been complied with.

## **8. Decision making**

Decision making process involve consultation between the project proponent (assisted by a consultant) and the impact assessment authority (assisted by an expert group if necessary)

The decision on environmental clearance is arrived at through a number of steps including evaluation of EIA and EMP.

## **9. Monitoring the clearance conditions**

Monitoring should be done during both construction and operation phases of a project. This is not only to ensure that the commitments made are complied with but also to observe whether the predictions made in the EIA reports were correct or not. Where the impacts exceed the predicted levels, corrective action should be taken. Monitoring will enable the regulatory agency to review the validity of predictions and the conditions of implementation of the Environmental Management Plan (EMP).

### **3.2. Roles of different actors in the EIA process**

EIA process involves many parties, grouped by their role definition within the process. The following section outlines the basic responsibilities of various bodies:

The Project Proponent

The Environmental Consultants

The State Pollution Control Board / Pollution Control Committees (PCCs)

The Public

The Impact Assessment Agency

#### **The Role of the Project Proponent**

The project proponent during the project planning stage decides the type of projects i.e. new establishment, expansion or modernisation. Later the project proponent needs to prepare the Detailed Project Report/Feasibility Report and submits the Executive Summary, which shall incorporate the project details, and findings of EIA study, which is to be made available to concerned public.

The proponent has to approach the concerned SPCB for NOC and holding the public hearing. After the public hearing the proponent submits application to IAA for environmental clearance.

### **Role of Environment Consultant**

Environmental consultant should be conversant with the existing legal and procedural requirements of obtaining environmental clearance for proposed project. The consultant should guide the proponent through initial screening of the project and establish whether EIA studies are required to be conducted and if so finalise the scope of such study. The consultant should also be fully equipped with required instruments and infrastructure for conducting EIA studies. The environmental consultant is responsible for supplying all the environment-related information required by the SPCB and IAA through the proponent. The consultant is also required to justify the findings in the EIA and EMP during the meeting with the expert groups at IAA.

### **The Role of the State Pollution Control Board (PCB) /Pollution Control Committee (PCC)**

The State PCBs/PCCs are responsible for assessing the compatibility of a proposed development with current operational and prescribed standards. If the development is in compliance, the PCB will then issue its NOC. They shall also hold the public hearing as per the provisions of EIA notification. The details of public hearing shall be forwarded to IAA.

### **The Role of the Public**

The public also has an important role to play in EIA. The concerned persons will be invited through press advertisement to review information and provide their views on the proposed development requiring environmental clearance.

### **The Role of the Impact Assessment Agency (IAA)**

Where a proponent is required to obtain environmental clearance, the IAA will evaluate and assess the EIA report. In this process the project proponent will be given a chance to present his proposal. If a project is accepted the IAA will also prepare a set of recommendations and conditions for its implementation based on this assessment. Environmental clearance conditions and recommendations of IAA are made available to the public on request through SPCB and through web site at <http://envfor.nic.in>. During the implementation and operation of the project, the IAA will also be responsible for the environmental monitoring process.

## **4. EIA in India**

### **4.1. EIA prior to 1994**

In India, the assessment of projects for environmental impacts, though not known in the exact manner as it is today, dates back a few decades.

The first major instance of incorporating provisions for the assessment of environmental impact of a project in any legal instrument was seen in the case of Central Water Commission (CWC). In the guidelines issued by CWC in 1975, the Commission provided for conducting investigations regarding major irrigation and hydroelectric projects. It was stated in the legal instrument of CWC under the chapter on environment that the planning, construction and operation of projects have impacts on ecology, some of which are irreversible. Therefore it would be necessary to carefully evaluate these impacts.

The actual EIA process in India was started in 1976-77 when the Planning Commission asked the then Department of Science and Technology to examine the river-valley projects from environmental angle. This was subsequently extended to cover those projects, which required approval of the Public Investment Board. These were administrative decisions, and lacked the legislative support.

Initially, up till 1994, in India, EIA clearances existed in form of 'Environmental Clearances' and appraisals which were an administrative requirement only for big projects undertaken by the Government or public sector undertakings. The Environmental Clearances for these projects were carried out under administrative guidelines, which required the project proponents of major irrigation projects, river valley projects, power projects, ports and harbors, *etc.*, to secure a clearance from the Union Ministry of Environment and Forests (MoEF). The procedure required the authority to submit environmental information to the MoEF by filling out questionnaires or checklists. The ministry's Environmental Appraisal Committees carried out the Environmental Clearances and appraisals.

### **4.2. EIA Notification 1994**

The Government of India enacted the Environment (Protection) Act on 23<sup>rd</sup> May 1986. To achieve the objectives of the Act, one of the decisions that were taken is to make environmental impact assessment statutory.

On 27<sup>th</sup> January 1994, the MoEF notified mandatory EIA's under Rule 5 of the Environment (Protection) Rules, 1986 for 29 designated projects. This is the principal piece of legislation governing environmental impact assessment.

The notification made it obligatory to prepare and submit an EIA, an Environment Management Plan (EMP), and a project report to an Impact Assessment Agency (Agency) and was required to consult a multi-disciplinary committee of experts. The EIA provision was hence made a mandatory requirement under the Environment Protection Act, 1986 with the following four objectives:

1. Predict the environmental impact of projects
2. Find ways and means to reduce adverse impacts;
3. Shape the projects to suit local environment;
4. Present the predictions and options to the decision-makers.

The Notification legislated under the Environment Protection Act, 1986 was responsible for ensuring that developmental projects (industries and infrastructure like dams, mines, refineries, large commercial complexes, highways, power projects, etc.) account for their environmental impacts as part of their planning and design processes.

The notification specified the process of obtaining Environmental Clearance (EC) for such projects, and also provided for the only element of public participation that there is in the entire process, as such public input is critical, among other things, for example, in ensuring that the sustenance of communities that live in the project area are not threatened.

According to Schedule II of the notification, the EIA is expected to cover at least the following matters:

1. Description of the proposed activities;
2. Description of the base environmental and climatic conditions and potential affected environment including specific information necessary to identify and assess the environmental effect of the proposed activities
3. Analysis of the land use and land use change, waste generation, water consumption (and the existing balance), power consumption etc. along with the social and health impacts (in terms of number of people displaced etc)
4. Description of the practical activities as appropriate
5. An assessment of the likely or potential environmental impacts of the proposed activity (like air pollution, noise generation) and the alternatives, including the direct or indirect, cumulative, short-term and long-term effects;
6. A risk assessment report and disaster management plan to mitigate adverse environmental impacts of proposed activity and assessment of those measures;
7. An indication of the likely area to be affected by the proposed activity or its alternatives;

8. A detailed environmental feasibility report of all the information provided.

The EIA report is prepared and submitted to the agency for approval. The report is required to include proposed measures to be undertaken by a proponent to mitigate or ameliorate the negative environment effects. If approved, an environmental agency statement and certificate of approval shall be issued by the agency.

The Notification also mandates a **public hearing**, with further review by a committee of experts in certain cases. Any member of the public can have access to a summary of the Project Report and the detailed EMPs. Public hearings are statutory / mandatory. This is the only piece of legislation that actually provides affected communities and the wide public some scope in influencing the final outcome of the decision.

In a move, the MoEF also took a step in decentralizing the responsibilities of conducting EIA (notification date 10th April 1997, No. S.O. 319 E).

The EIA Notification, 1994 was subsequently amended time and again. Amendments of 4<sup>th</sup> May 1994, 10<sup>th</sup> April 1997 and 27<sup>th</sup> January 2000 led to making EIA mandatory for 30 activities.

### **4.3. Amendments to EIA Notification, 1994**

Since its inception in 1994, the mechanism of EIA has come a long way before it was re-engineered in the year 2006 to overcome its limitation experienced over the years. This journey has proved to be a bumpy ride for this administrative mechanism with as many as 13 amendments in 11 years to re-engineering the whole process in 2006. The mechanism of EIA was devised to ensure that projects like dams, mines, industries, highways bridges, etc. do not cause irreversible & repairable damage to the environment. Despite started for a noble cause, experiences over the years have revealed that many projects that should either stop or at least modified have slipped through the cracks. Over the years of its existence, there is much more to be done when it comes to implementing the EIA notification.

Several changes were made to the original notification. The first amendment came within a few months of the notification on 4<sup>th</sup> May 1994. Many more were to follow. The EIA notification 1994 was amended almost 13 times in 11 years. While most of the amendments diluted the process of environmental clearance process, there were some, which also strengthened the process. Some of the key amendments are discussed as follows:

- **Amendment on 10<sup>th</sup> April, 1997:** The process of environmental public hearing (EPH) was introduced in the environmental clearance process. The SPCBs were entrusted to conduct public hearing to get the views and concerns of the affected community and interested parties for the proposed project. It was also entrusted with forming an EPH committee to ensure fair representation in the public hearing process. This amendment also made some changes with reference to the environmental clearance required for power plants.
  
- **Amendment on 13<sup>th</sup> June, 2002:** This amendment diluted the purpose of the notification exempting many industries from the EIA process or from the entire environment clearance process on the basis of level of investment.
  - It exempted pipeline and highway projects from preparing the EIA report, but these projects would have to conduct public hearings in all the districts through which the pipeline or highway passes.
  - A number of projects were totally exempted from the Notification if the investment was less than Rs 100 crore for new projects and less than Rs. 50 crore for expansion/modernisation projects.
  - Most of the industries exempted from the clearance process had a very high social and environmental impact even if the investment was less than Rs 100 crore. For example, in case of Hydel power projects, irrespective of the investment, there will be social impacts due to displacement.
  - No EIA was required for modernization projects in irrigation sector if additional command area was less than 10,000 hectares or project cost was less than Rs. 100 crore.
  
- **Amendment on 28<sup>th</sup> February, 2003:** This amendment added a little tooth to the notification. It took into consideration location-sensitivity into the environment clearance process. This amendment prohibited certain processes and operations in specified areas of the Aravalli range.
  
- **Amendment on 7<sup>th</sup> May 2003:** The notification was amended to expand the lists of activities involving risk or hazard. In this list, river valley projects including hydel power projects, major irrigation projects and their combination including flood control project except projects relating to improvement work including widening and strengthening of existing canals with land acquisition up to a maximum of 20 metres, (both sides put together) along the existing alignments, provided such canals does not pass through ecologically sensitive areas such as national parks, sanctuaries, tiger reserves and reserve forests.

- **Amendment on 4<sup>th</sup> August 2003:** This amendment was similar to the one in February 2003 that tried bringing in location-sensitivity in the entire environmental clearance process. Any project located in a critically polluted area, within a radius of 15 kilometres of the boundary of reserved forests, ecologically sensitive areas, which include national parks, sanctuaries, biosphere reserves; and any State, had to obtain environmental clearance from the Central Government.
- **Amendment on September 2003:** Site clearance was made mandatory for green field airport, petrochemical complexes and refineries. Moreover, the amendment added that no public hearing was required for offshore exploration activities, beyond 10 km from the nearest habitation, village boundary, goothans and ecologically sensitive areas such as, mangroves (with a minimum area of 1,000 sq.m), corals, coral reefs, national parks, marine parks, sanctuaries, reserve forests and breeding and spawning grounds of fish and other marine life.
- **Amendment on 7<sup>th</sup> July, 2004:** It made EIA mandatory for construction and industrial estate.
- **13<sup>th</sup> Amendment on 4<sup>th</sup> July 2005:** The amendment provided that projects related to expansion or modernization of nuclear power and related project, river valley project, ports, harbors and airports, thermal power plants and mining projects with a lease area of more than 5 hectares could be taken up without prior environmental clearance. The Central Government in the Ministry of Environment and Forests may, on case to case basis, in public interest, relax the requirement of obtaining prior environmental clearance and may, after satisfying itself, grant temporary working permission on receipt of application in the prescribed format for a period not exceeding two years, during which the proponent shall obtain the requisite environmental clearance as per the procedure laid down in the notification. The grant of temporary working permission would not necessarily imply that the environmental clearance would be granted for the said project.

The amendments have passed biased notion of MoEF towards industrial chambers. These amendments brought about on the basis of investment limits had proved to be a escape-gate for various projects for which there was a need for a proper check for their impacts on environment. For instance, until 2002, projects above Rs 50 crores needed clearance but this was amended to Rs 100 crores. Take the Mahadayi Diversion Scheme in the ecologically sensitive Western Ghats region as an example. The Karnatka State Government proposed to build two earthen dams on the Bhandura & the Kalasa Nalas (streams) of the Mahadai to divert water to

the east flowing Malaprabha. Both these projects, parts of the overall Mahadai Diversion Scheme, were estimated to cost Rs 49.2 crores and Rs 44.78 crores respectively. The combined cost would be over Rs. 90 crores, which would have made it necessary to obtain environment clearance had the amendment not occurred. However, the dams were shown as two independent projects and able to bypass the environment clearance procedure merely on the basis of an investment limit.

Similarly an amendment in August 2001 excluded Mining projects with lease area upto 25 hectares from public hearing. Leases below 25 hectares can cause tremendous damage in ecologically and culturally sensitive areas and under no circumstances can anyone make assumptions that these have “minimal” impacts and that public hearings are therefore not required. There are umpteen examples of leases under 25 hectare for both minor and major minerals from around the country which have caused or will cause significant social and ecological impacts. We have the marble mines in the Alwar district of Rajasthan, the iron ore mines in Sundur in Bellary district of Karnataka, the bauxite mines in the tribal areas of the Anantgiri in the Eastern Ghats of Andhra Pradesh, the coal mines in Jaintia Hills of Meghalaya etc. We also have the example of both the Doon Valley and the Aravallis where smaller leases have caused extensive environment damage and mining activities have subsequently been regulated by both the judiciary and the MoEF (vide Amendment dated 28<sup>th</sup> Feb, 2003).

By an amendment in December 2000, defense related road construction projects in border areas were excluded. All over North East India, the defense roads are largest developmental projects. The Sikkim State Biodiversity Strategy and Action Plan states road construction as a major cause of deforestation in the state and presents certain action points to reduce the damage due to developmental activities. Such construction has caused fragmentation of wildlife habitats and brought in huge number of people for labor, creating pressure on the local natural resources like firewood.

Due to reasons like these, there was a wide spread opinion that the EIA notification was not able to address all the concerns and had several weaknesses which was making the entire clearance process, weak. The EIA movement in India has been severely marred by the consistent amendments over the years. It has been reduced to a formality rather than an obligatory measure to safeguard the environment and make the project sustainable. The experience with these assessments has been far from satisfactory. EIA reports have been done in an extremely shoddy, incomplete and inadequate manner. Yet year after year, projects have been cleared, despite criticism and protests.

In September 2006, the MoEF re-engineered the EIA process with a view to bring about some significant modifications. A draft notification was prepared with special consultations with the industry associations at the behest of the Prime Minister's Office and was published on 15<sup>th</sup> September, 2005. This was put up for public comment for a year and was then notified on 14<sup>th</sup> September 2006.

#### **4.4. EIA Notification 2006**

The currently applicable EIA notification was introduced by the MoEF on 14<sup>th</sup> September, 2006. This was a year after the draft notification was placed on the MoEF website, in response to which, comments were sent by several groups and organizations. Since objective of EIA Notification 2006 was to address the limitations in the old EIA Notification (1994), various modifications have been incorporated, which the Ministry claims to have done after taking into account the feedback from the different stakeholders.

Though, there have been some improvements in the new notification over the previous one, it has certainly failed to meet the expectations of the various stakeholders, especially members of the civil society, NGOs and local community.

The EIA-2006 is an outcome of the recommendations made by the Govindarajan Committee. It was constituted to examine the procedures for investment approvals and project implementation. It found that the environment clearance causes maximum delay to projects and recommended that some of the cumbersome procedures be modified. Consultations on the draft notification were held only with representatives from industry and central government agencies (Asscom, FICCI, CII and MoEF).

The 2006 Notification has tried bringing in more number of projects within the purview of the environmental clearance process. As a result, a revised list of projects and activities has been redrawn that requires prior environmental clearance. Most importantly, there is no categorization of projects requiring EIA based on investment, rather size or capacity of the project determines whether it is cleared by the central or state government.

The major difference in the EIA Notification 2006 from the earlier one (1994) is its attempt to decentralize power to the State Government. Earlier all the projects under schedule 1 went to the Central Government for environmental clearance. However, as per the 2006 notification, significant number of projects will go to the state for clearance depending on its size/capacity/area. For this, the notification has made a provision to form an expert panel, the Environment Appraisal Committees (SEAC) at the State level. Though this is a good attempt to reduce the burden on the central government, however, this provision can be misused as in

many cases state government is actively pursuing industrialization for their respective state. The notification has also failed to mention if there would be some sort of monitoring of state level projects by the central government.

The notification also talks about 'Scoping', which was completely missing earlier. The terms of reference (ToR) of the project will now be decided by the SEAC at the state-level and by Environment Appraisal Committees (EAC) at the Central level. This will be decided on the basis of the information provided by the proponent. If needed the SEACs and EACs would visit the site, hold public consultation and meet experts to decide the ToR. The final ToR has to be posted in the website for public viewing. Though this seems good on paper, however, the proponent itself is providing the information for finalisation of ToR and moreover there is no compulsory provision for public consultation. Further, if the EAC does not decide the ToR within the stipulated time, the project proponents can go ahead with their own ToR.

Though there is clear mention of appraisal in the EIA process, there is no mention of post monitoring, a very important part of the entire EIA process.

The area where there could have been major improvements in environment clearance process, i.e. public consultation, the 2006 EIA notification is a major disappointment. The public consultation as was earlier done will still be conducted at the end of the environment clearance process where there is very little scope for the public to play any active role.

Moreover, the 2006 Notification has made few changes that weaken the public consultation process. There is a provision in the notification where a public consultation can totally be foregone if the authorities feel the situation is not conducive for holding public hearing. This can limit the involvement of people. Further, the consultation process has been divided into public hearing for local people and submission in writing from other interested parties. If this is the case, then NGOs/civil society organization will not be able to take part in the public hearing process, which will significantly affect the efficiency of the consultation process.

The focus of the 2006 Notification has been to reduce the time required for the entire environment clearance process. The earlier process took around 14-19 months for Rapid EIA and 21 to 28 months for comprehensive EIA. As per the notification, the category A project will be completed only in 10.5 to 12 months. There seems to be no justification for this and may result in compromising on the efficiency and transparency of the clearance process, which was quite evident from the earlier notification even though the process had more time.

#### 4.5. Major differences between EIA Notifications of 1994 and 2006

Some of the key differences in the current Notification and the old one are listed in the following table<sup>2</sup>:

	<b>EIA Notification 2006</b>	<b>EIA Notification 1994 (including amendments)</b>
1	<p>Projects in Schedule-1 have been divided into two categories, Category A and B.</p> <p>Category A project will require clearance from Central Government (MEF). Category B will require clearance from State Government. However, the state government will first classify if the B project falls under B1 or B2 category. B1 projects will require preparation of EIA reports while remaining projects will be termed as B2 projects and will not require EIA report.</p> <p>This has the potential of being a good move as decentralization of power may speed up the project clearance process. However, it may be misused and there is an urgent need to build the capacity of the state regulators to deal with their new responsibilities.</p>	<p>Proponent desiring to undertake any project listed in Schedule-1 had to obtain clearance from the Central Government.</p>
2	<p>Well defined screening process with projects divided into two categories:</p> <p>Category A: All projects and activities require EIA study and clearance from central government.</p> <p>Category B: Application reviewed by the State Level Expert Appraisal Committee into two categories - B1 (which will require EIA study) and B2, which does not require EIA study.</p>	<p>In screening, the project proponent assesses if the proposed activity/project falls under the purview of environmental clearance, than the proponent conducts an EIA study either directly or through a consultant</p>
3	<p>Scoping has been defined in the new</p>	<p>Scoping was not applicable. The terms of</p>

<sup>2</sup> Source: Industry and Environment Unit, Centre for Science and Environmet, 2006.  
<[http://www.cseindia.org/programme/industry/eia/existing\\_notification.htm](http://www.cseindia.org/programme/industry/eia/existing_notification.htm)>

<p>Notification. However, the entire responsibility of determining the terms of reference (ToR) will depend on the Expert Appraisal Committee. This will be done in case of Category A and Category B1 projects. However, the finalisation of ToR by the EACs will depend on the information provided by the project proponent. There is however a provision that the EACs may visit the site and hold public consultation and meet experts to decide the ToR. However, if the EACs do not specify the ToR within 60 days, the proponent can go ahead with their own ToR.</p> <p>The final ToR shall be displayed on the website of the Ministry of Environment and Forests and concerned State / Union Territory Environment Impact Assessment Authority (SEIAA).</p>	<p>reference was completely decided by the proponent without any public consultation.</p>
<p>4 Public Consultation- All Category A and Category B1 projects or activities have to undertake public consultation except for 6 activities for which public consultation has been exempted. Some of the projects exempted include expansion of roads and highways, modernization of irrigation projects, etc. Some of these may have potential social and environmental impact.</p> <p>The responsibility for conducting the public hearing still lies with the state PCBs. Member- Secretary of the concerned State Pollution Control Board or Union Territory Pollution Control Committee has to finalise the date, time and exact venue for the conduct of public hearing within 30 days of the date of receipt of the draft Environmental Impact Assessment report, and advertise the same in one major National Daily and one Regional vernacular Daily. A minimum notice period of 30 days will be given to the</p>	<p>The project proponent has to write to State Pollution Control Board to conduct public hearing.</p> <p>It was the responsibility of the State Boards to publish notice for environmental public hearing in at least two newspaper widely circulated in the region around the project, one of which shall be in the vernacular language of the locality concerned.</p>

public for furnishing their responses.

The public consultation will essentially consist of two components – a public hearing to ascertain the views of local people and obtaining written responses of interested parties.

There are no clear guidelines like in earlier Notification who all can attend the public hearing. The use of “local people” for public hearing raises doubt if the hearing can be attended by interested parties like NGOs, experts, etc or is restricted to only locals. Is the role of NGOs/experts limited to the sending written letters/feedback to the PCB?

The Notification makes provision that Ministry of Environment and Forest shall promptly display the Summary of the draft Environment Impact Assessment report on its website, and also make the full draft EIA available in Ministry’s Library at New Delhi for reference.

No postponement of the time, venue of the public hearing shall be undertaken, unless some untoward emergence situation occurs and only on the recommendation of the concerned District Magistrate. This was not a part of the earlier Notification.

The SPCBs or Union Territory Pollution Control Committee shall arrange to video film the entire proceedings. This was also absent in the earlier notification and may be considered as a good move to ensure that public hearing is proper.

Unlike the earlier notification, no quorum is required for attendance for starting the proceedings. This may be misused.

#### 4.6. Criticisms to EIA Notification, 2006<sup>3</sup>

Several points of contention regarding the changes that were proposed to the EIA notification 1994 in the draft notification of 2005 remain unaddressed in the 2006 notification.

Firstly, the most critical concern about the notification remains the process by which it has come to being. Consultations on the draft notification were held only with representatives of industry and central government agencies, as per the Ministry's own submission. State governments, Panchayats and municipalities, NGOs, trade unions and local community groups were partially or completely kept out of the process. This inherent bias of the Ministry to negotiate with industry on what an environment regulation should be; clearly carries through the text of the notification as well.

The categorization of projects in the notification, into A and B, has been done based on "spatial extent of potential impacts on human health and natural and man made resources". Category A projects are to be clearance by the MoEF while Category B projects are to be cleared by the State Environment Impact Assessment Authority. (SEIAA)

The handing over of the responsibility of granting clearance to a large number of projects to the state governments without any system of checks and counter checks is not acceptable. In many instances, the state government is directly involved in seeking investments. Handing over the entire function of environment regulation into their hands will most certainly mean that projects are cleared indiscriminately.

The SEIAA is a body created to grant clearance at the state level. Where will this authority be housed and who will it be accountable to? Can the decisions of the Authority be challenged in the existing Environment Appellate Authority or will it be some other body? These are not known at all. Unless this is figured out and incorporated in the notification, this body cannot be allowed to grant clearances. .

Exclusion of large capacity and impact projects from EIA: Construction projects also need not go through the stages of screening or scoping because they are exempted from doing EIA studies. They also do not need to conduct the public consultation process. So they are present in the EIA notification only in so far as having to be cleared by the SEIAA on the basis of the application form. Thus this remains a category in the notification purely for cosmetic reasons.

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<sup>3</sup> Source: Abstract of 'EIA notification 2006: A critique', by Manju Menon and Kanchi Kohli, <<http://www.kalpavriksh.org/campaigns/campeia/campaignsEIAnote>>

Several large capacity projects are left out of the notification altogether. All building and construction projects with less than 20,000 sq.mtrs built up area like the Vasant Kunj Square Mall, in Delhi are now exempted from the notification. (According to the June 2006 Rapid EIA report the total built up area is 19021.108 sq mtrs.). There are several such complexes being constructed in cities and towns today and will be totally exempt from the EIA notification.

Will thermal power projects less than 500 MW or cement plants less than 1 MTPA not require any environment clearance at all? Or will state governments follow a separate set of rules for grant of clearance to these projects since the EIA notification does not deal with them? If indeed it is the former that is true, then this notification will in no way achieve environment impact regulation.

**What after clearance?** The notification deals only with process of grant of environment clearance (divided into 4 stages: Screening, Scoping, Public consultation and Appraisal). And it stops there. The most critical issue of monitoring and compliance which is an integral part of the Environment Clearance regime is dealt with in precisely three sentences. There is only a mention of the six monthly compliance reports which are to be submitted by the project proponent. The EIA notification 1994 mandated the MoEF to maintain its independent monitoring report. This role of the MoEF finds no mention whatsoever in the new notification. This could mean several things. One, that the MoEF does not see the need to independently monitor the projects that it has cleared and that its function ends with granting clearance; two, that the project proponents will monitor themselves adequately.

Either of these assumptions is in sheer contrast to the experiences of compliance of projects on the ground. Project proponents are being continually pulled up by local governments for violating state and central laws and for non-compliance of clearance conditions. Also several of the Ministry's own monitoring reports indicate non compliance on which it has most often failed to take action. (eg; the Teesta- V hydroelectric project in Sikkim)

The notification is also silent on the point of who would be the monitoring agency for projects cleared by the state government. Will it be the SEIAA or will these projects be self monitored? It is absurd if the latter is what is expected to take place.

There is no role for local community groups to be involved in monitoring of projects.

**Stage I –Screening:** This stage is primarily to differentiate between projects belonging to category B which are to be cleared by the SEIAA. The decision as to

whether a project falling within this category needs an EIA to be conducted (B 1) or not (B 2) is to be done on the basis of the information provided by the applicant in an application (Form 1 or Form 1A in case of construction projects.). Eg; a 450 MW thermal power plant can, based on the information provided by the project proponent allowed to go through the clearance process without an EIA!

In the present situation where fraudulent EIAs have been exposed at public hearings and decisions to clear the project have also been made on the basis of such reports, it is rather ironic that the Ministry believes that any decision can be made on the basis of the application form, which may not be done after some amount of investigation by an environment consultant (as in the case of an EIA report) and does not go through any public scrutiny.

A more serious problem is that there is nothing yet in the notification or the Form 1 or 1A that could stop the SEIAA from transferring all projects to category B 2 and therefore doing away with the need for EIAs and public hearings. The notification only vaguely states that the Ministry will issue guidelines from time to time for the categorization of B 1 and B 2 projects. If most projects of Category B do end up in the B 2 list, then they will be appraised (stage 4 of the clearance process) and granted clearance on the basis of information in the application form and discretionary site visits.

**Stage 2-** Scoping: Is the step to determine the various aspects that need to be studied in the EIA report. However, Construction/townships/commercial complexes/housing that fall in Item 8 category B of the schedule have been exempted from the need to do EIAs and are to be cleared on the basis of information in Form 1/Form 1A. Is it because these projects do not or cannot have any environmental impacts?! Certainly not. Or is because it is felt that potential environment impacts do get analysed in the conceptual plan documents of the project? An EIA for such a project if done well, is a much more comprehensive document to understand the environmental impacts of the project in its entirety. It can also offer creative ways of mitigating them to the maximum extent possible rather than relying on the standard procedures that may be possible under the pollution norms which are mostly based on cut off/upper limits.

**Stage 3-** Public Consultation: This stage of the EIA process is to comprise of two aspects; a public hearing process in which only local affected people can participate and a process for obtaining written comments from others who are concerned citizens

Exemption from public consultation: There are 6 sets of activities which have been exempted from the process of public consultation completely. There is no explanation whatsoever as to why these projects have been exempted from this

extremely important step of the environment clearance process. Since this is a step to ascertain “the concerns of locally affected persons and others” their exemption means that the Ministry is not interested in ascertaining the concerns of locally affected persons and others while clearing these projects.

The Public Consultation process as laid out in the EIA notification, 2006 is severely flawed and clearly limits public participation on the following grounds:

**Availability of Draft EIA report:** Only a draft EIA report will be available to the locally affected persons at the time of the public hearing. Citizens will now not get to see the final EIA document on the basis of which the decision on the project will be made. There are enough examples in the last 12 years of the existence of the EIA notification when project proponents have sought clearance on incomplete and misleading data. The Ministry has not only failed to take punitive action against erring agencies but gone ahead and cleared projects based on these reports. This practice will only grow if the final EIA report is not open to public scrutiny.

The appendix IV states that the ‘draft EIA report with the generic structure...’ is to be available to the public prior to the hearing. This does not ensure that the draft report will have an adequate description of environmental impacts of the project, such that they can be understood by readers. If the draft is very rudimentary, the public hearing will be a waste of public time and money. The notification should have either laid down details of the degree of information that the draft report should contain or should have introduced clauses of punitive action if the draft allows only an ineffective public hearing due to being uninformative or less informative.

Further, the public will have no control over whether or not their inputs and concerns get incorporated in the EIA report and influence the decision making process.

The time period for which the draft EIA report will be available prior to the hearing is not mentioned in the notification. The 1994 notification mandated that it be available for a period of 30 days prior to the hearing.

**Cancellation of Public Hearing:** This clause which requires the public hearing to be cancelled if the local conditions are not conducive is subject to severe misuse by the project proponents and regulatory authorities. This point was also raised in the comments sent by several civil society organizations to the MoEF, which have not been taken on board. The inclusion of this clause is a severe setback to the notification as it has in effect made the public hearing procedure a discretionary procedure when it was mandatory until now.

No Postponement of Public hearing except in exceptional circumstances and unless there is some untoward emergency: Can the non-availability of the EIA report for enough time or inadequate draft EIA be reason for the cancellation or postponement of the public hearing? In various places, these have been the reasons why local communities have demanded the same.

Detailed documentation of the conduct of public hearings at the local level in various places indicates severe lacunae in the implementation of the public hearing process. Some of the issues that public hearings have thrown up until now, and that remain unaddressed in the new public consultation process as well are;

No quorum required for attendance to start the proceedings: Does this imply that the public hearing can start with the public hearing panel being incomplete? This completely goes against the Gujarat High Court judgment on public hearings.

Who can attend public hearings? The notification states that the public hearing will be primarily for the purpose of ascertaining concerns of local affected persons. Other concerned persons who have plausible stake in the environmental impacts can make submissions in writing. This clearly limits the participation of people's groups, and civil society organizations, which have over the last 12 years, raised critical concerns at the time of the public hearing. Further, if the SEAC, or EAC feels that a certain person or organization does not have a plausible stake in the environmental impacts, then they have the discretion of not accepting even a written submission from them.

**Stage 4- Appraisal:** The projects which do not need to conduct EIA studies or go through public consultation will be appraised only on the basis of information in the application form and discretionary site visits.

There is no system of public participation at this stage. As a result, citizens will not get to see the final documents on the basis of which the Appraisal committees will recommend clearance to the project.

The Screening, Scoping and Appraisal committees do not include social scientists, ecosystem experts or NGOs. These groups were included in the composition of appraisal committees in the 1994 notification. There is also no mention of the need for women members in the committees. Letters with detailed research on past committees and their problems have been sent to the MoEF.

Grant of clearance: The notification needs to specify as to when the clearance letter granted to a project will be made public and how this will be done.

Validity of environment clearance: For hydroprojects, the clearance granted will now be valid for 10 years and to a maximum of 30 years for mining projects. This is a big change from the 1994 notification which allowed a validity period of 5 years. The increase in the validity period will have a big say in the impact of the project as the developer may start work on the project just before the expiry of the period by which time the parameters of the EIA study (such as demographic or ecological) may have altered significantly and made redundant the conclusions of old EIA studies.

Form 1 and EIA generic structure: Both the form and the generic format for EIAs are lacking on several counts. Some examples are; the Impacts on Biodiversity and People's Livelihoods continue to be missing from Form 1 or format of the EIA report. This is a suggestion that has been repeatedly sent to the MoEF for over several years but continues to be ignored. Section (2) on the use of natural resources, there is only a mention of land, water and so on. In these Forests has been clubbed with Timber, limiting the ecological and biodiversity value of the same. There is no information sought on the ethnography of the people of the area and their natural resource dependencies. Moreover there is no scope of presenting of socio economic data in Form 1.

Fast tracking clearances at the cost of environment assessments? The EIA notification, 2006 states that the EAC or SEAC will convey the terms of reference within 60 days of the receipt of Form 1. While the notification clearly lays down guidelines on how long it should take for each of the 4 stages to be completed for grant of environment clearance, there is no mention or record of how much minimum time must be spent on putting together a comprehensive EIA report. The quality of EIA reports was one of the major concerns with the implementation of the EIA notification from the very beginning. This has also been repeatedly pointed out to the MoEF and concerned authorities.

The quality of EIA reports was severely compromised and they were called Rapid or Single Season EIA Report. The 2006 notification should have specified the time needed between the grant of TOR and the completion of at least a four season EIA report.

**Other problems** - The Screening, Scoping and appraisal committees do not include social scientists, ecosystem experts or NGO's which were included in the 1994 version of the notification. Even the willingness for assessment is not upto the mark in industries.

## **5. Infrastructure Development and Environment**

### **5.1. Introduction**

The term infrastructure generally refers to the physical framework of facilities through which goods and services are provided to the public. The extent of infrastructure affects not only production and consumption directly but also will have an impact on every sector of economy. Historically World over the infrastructure provision is predominantly done by Govt. or Government agencies with little involvement of private sector. However, the scenario has changed with times and India too has joined the band wagon of other Countries in involving private sector after 1991 liberalization as investments for developing infrastructure to World standards are very high.

To enable the country to raise its resources the only option Government foresees is involvement of Private sector. Too woo the private sector Government has to provide lot of incentives sometimes at the cost of natural resource management and environment.

Though the infrastructure sector include wide spectrum of activities/services, the present paper focus only on power, roads and ports development since these are the areas which has direct and indirect short term as well as long term impacts on environment and natural resource management.

### **Environmental Clearance in India**

The environmental clearance after EIA study was started in 1978 as a directive of Planning Commission for Government of India funding. This was to be done by NCEPC under Department of Science and Technology, Govt. of India. After formation of Department of Environment (DE) 1980 the same job has been transferred to Department of Environment from DST. In the Country Environmental clearance and EIA has become mandatory only in 1994 for selected projects whether they are executed with State funds or private funds. Infrastructure development commenced by both public and private sector are to obtain environmental clearances and get EIA done. This position stands affirmed even after the new notification in 2006 was issued for the EIA.

EIA is a planning tool that is now generally accepted as an integral component of sound decision-making. The objective of EIA is to foresee and address potential environmental problems/concerns at an early stage of project planning and design. EIA/EMP should assist planners and government authorities in the decision making process by identifying the key impacts/issues and formulating mitigation measures. Ministry had issued sectoral guidelines some time ago.

EIA of any infrastructure covers the whole gamut of issues like regulatory requirements, baseline studies, and identification of key issues and consideration of alternatives, impact analysis and remedial measures in a systematic way. It also involves the process of reviewing the adequacy of EIA and EMP reports and post-project monitoring.

The infrastructure projects to be cleared are subjected to an appraisal by Environment Appraisal Committee (EAC). The projects requiring forest/wildlife clearance are cleared for environmental clearance only after these are obtained. The projects requiring environmental clearance are also required to obtain NOC from the respective State Pollution Control Board under Water and Air Acts, Land and Water Availability approvals from State Government.

### **5.3. National Environment Appellate Authority Act, 1997**

The environmental clearance so given under Environment (Protection) Act, 1986 could be appealed to **National Environmental Appellate Authority** constituted as per the **National Environment Appellate Authority Act, 1997**.

The National Environment Appellate Authority Act came into force in 1997. It aims to provide for the establishment of a National Environment Appellate Authority to hear appeals with respect to restrictions of areas in which any industries, operations or processes shall not be carried out or shall be carried out subject to certain safeguards under the Environment (Protection) Act, 1986 and for matters connected therewith or incidental there to.

As per this Act any person aggrieved by the order of granting environmental clearance for industry process in the prohibited areas or granted any conditional clearance, may approach authority within 30 days from the date of such order as per the procedure and form prescribed. The authority however has the discretion to entertain such appeal even after 30 days but not after 90 days from the date of order/clearance, provided they are satisfied there is sufficient ground for filing the appeal.

The authority shall dispose the petition within 90 days from the date of filing the appeal. The authority while processing or hearing the petition shall be guided by principles of natural justice and subject to the provisions of the Act and rules made Central Government could be there is a bar of Jurisdiction that no civil Court or other authority not to entertain any appeal on this matter, the interested parties have rarely preferred public interest litigation's over appeal to this authority.

### 5.3. A few Case Studies

#### I) Dams, embankments, barrages and dredging

##### 1. Farakka Barrage

The Farakka Barrage inside India, 18 km upstream of the international border (Indo-Bangladeshi border), became operational in 1975.

Before its inception, experts of Bangladesh and India warned that the project may cause serious environmental degradation. A massive campaign in both the countries was also waged against the proposed project (before its inception).

It is alleged that since the barrage's operation, it has been diverting a substantial amount of dry season flow of the Ganges River through the Hoogly River and has thus initiated an irreversible process of deterioration of the Gorai River flow (a major tributary of the Ganges River).

It was alleged that vested interests like those of the construction industry, engineers and others, including politicians, has prompted Indian government to go ahead with the proposed plan. The Bangladeshis also alleged that in the Farakka Barrage EIA, Indians identified the effects on the Ganges only right down to as far as the Barrage, and no further. Bangladesh was of the opinion that the EIA conducted on the project site was manipulated in India's favor. It says that the EIA did not take into account the effects or impacts on the project on Bangladesh and merely concluded with the extent of the Ganges River flowing through India.

Bangladesh is alleging that the Farakka barrage is slowing down the flow of sweet water and affecting the Sundarbans, where the largest mangrove forests in the world are located. It is feared the increased salinity will affect the rich biodiversity of the mangroves.

#### Major issues involving EIA

**Technology and knowledge:** A purely technical solution to the loss of navigability in Kolkata Port was provided by the building the Farakka Barrage. An Environmental Impact Assessment (EIA) combined with a transboundary impact assessment was not seen as needed in the context of existing knowledge in the mid-1970s.

**Neglect of environmental value of water:** The allocation of water in the basin for various uses such as agriculture, industry, domestic, navigation, etc. has not included ecosystem function. It is important to keep the rivers alive to support

aquatic ecosystems and the coastal mangroves, which are dependent on the balance between fresh and saltwater. This goal requires adequate basinwide EIA and monitoring. Generally, it is the case in most developing countries that EIAs are inadequate or side-stepped.

**Improper pricing policies:** Investment costs in the irrigation sector in both India and Bangladesh are rarely recovered. This may be responsible for the overuse of water by the farmers, and for the shift to water-intensive crops.

**Lack of good governance at the national level:** Water-resources management in all the co-riparian countries is fragmented among many agencies and needs to be integrated. Water Resources Councils have been established in all the three countries involved, namely, India, Nepal and Bangladesh, but they appear not to function, except in Bangladesh. Environmental laws and dependence on large engineering interventions have delayed solutions to pressing problems. There is a need for more transparency, inclusion, and sharing of information among stakeholders. Focus can shift to small impoundments like ponds and tanks so that the major impacts of large diversions can be avoided.

**Lack of good governance at the international level:** There is no mechanism for monitoring hydrological information and ensuring the use of accurate data by all the co-riparian states. The Indo-Nepal Treaty (1996) has not progressed much because of differences in perspective about the respective water rights and also about the area to be submerged if a dam is built. Until 1996, the Farakka project was a subject of contention between India and Bangladesh. The 1996 treaty attempts to apportion the water resources at Farakka in an equitable manner but also refers to best utilization of the resource. Since the GBM region encompasses many rivers, the treaty provides a good example for considering the sharing of the waters of the other rivers.

Due to all the reasons mentioned above, the Farakka barrage is a major matter of controversy between India and Bangladesh.

## **2. Narmada Dam Project**

Post-1947, investigations were carried out to evaluate mechanisms in utilizing water from the Narmada river. Due to inter-state differences in implementing schemes and sharing of water, the Narmada Water Disputes Tribunal was constituted by the Government of India on 6<sup>th</sup> October 1969, to adjudicate over the water disputes. This Tribunal investigated the matters referred to it and responded after more than 10 years. On 12 December 1979, the decision as given by the Tribunal, with all the parties at dispute binding to it, was released by the Indian Government.

As per the Tribunal's decision, 30 major, 135 medium, and 3000 small dams, were granted approval for construction including raising the height of the Sardar Sarover Dam.

In 1984, work began on the first of two giant dams that would harness the waters of the Narmada for irrigation and electricity. Amongst the 30 large dams planned for the Narmada, the Sardar Sarovar dam is the largest.

The damming of the Narmada has aroused huge controversy, in India and in the West. The basic issue of controversy is the displacement of a large number of tribal people who have lived near the project site since generations.

Narmada Bachao Andolan is a non-governmental organisation (NGO) that mobilised the tribals, farmers, environmentalists and human rights activists against the Sardar Sarovar Dam being built across the Narmada River in Gujrat. It originally focused on the environmental issues related to trees that would be submerged under the dam water. However, later on it re-focused with the aim to enable the poor citizens especially the oustees to get the full rehabilitation facilities from the government.

In 1985, the activists noticed that the project work being shelved due to an order by the MoEF. The reasons for this was cited as "non-fulfillment of basic environmental conditions and the lack of completion of crucial studies and plans". The activists alleged that the people who were going to be affected were given no information, but for the offer for rehabilitation. Due to this, the villagers had many questions right from why their permission was not taken to whether a good assessment on the ensuing destruction was taken. Furthermore, the officials related to the project had no answers to their questions. It was also alleged that the project was not sanctioned at all, and that the officials had overlooked the post-project problems.

Narmada Bachao Andolan, led by Medha Patkar, filed a writ petition<sup>1</sup> with the Supreme Court, seeking stoppage of construction on the Sardar Sarovar dam. The court initially ruled the decision in the Andolan's favor thereby effecting an immediate stoppage of work at the dam and directing the concerned states to first complete the rehabilitation and replacement process.

One of the real issues before the court was whether in 1987, when the MoEF had first granted the **environmental clearance to build dam (subject to certain**

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*Narmada Bachao Andolan v. Union of India & Others*, SC 319 of 1994, 18 Oct. 2000

**conditions**), was the clearance granted without proper application of mind. The court probed into the issue whether clearance was made in haste, without giving proper regard to the environmental and social impacts of the project.

The Supreme Court deliberated on this issue further for several years. Finally, it upheld the Tribunal Award and allowed the construction to proceed, subject to conditions. The court introduced a mechanism to monitor the progress of resettlement *pari passu* with the raising of the height of the dam through the Grievance Redressal Authorities (GRA) in each of the party states. The court's decision given in the year 2000 after seven years of deliberations, has paved the way for completing the project to attain full envisaged benefits. The court's final line of the order states, "Every endeavour shall be made to see that the project is completed as expeditiously as possible".

### **3. Tehri Hydro Development Project**

The Tehri dam project was approved in 1972 and construction was started in 1978. The Tehri Hydro Development Corporation was constituted in 1989 to supervise the construction of the dam. The main dam of the project is built near the old Tehri town that lies at the confluence of the rivers Bhagirathi, (one of the major tributary of the river Ganga) and Bhilangana.

The main dam is set to produce 2000 MW of electricity when completed. However, only the Phase-I with capacity of 1000 MW is approved at present. There is another smaller dam 14 km downstream at Koteshwar that will produce 400 MW of electricity. The main reservoir comprises an area of 42 km<sup>2</sup>. This has now flooded the old Tehri town and 112 villages around the town, thereby displacing more than 100,000 people. The town of New Tehri, on the hillside above the dam, has been built as a result.

A writ petition<sup>2</sup> was filed praying directions restraining the Union of India, State of UP (as Tehri was in UP initially) and the Tehri Hydro Development Corporation from constructing and implementing the Tehri Hydro Power project. The main contention against the construction of the dam was on the basis that the plan for the Tehri project had not considered the safety aspect of the dam and serious threat existed due to this construction, as north India is prone to earthquakes. Proper EIA was not conducted and EIA was present only on paper. The design of the dam was on a site which was prone to seismic activity hence posing grave danger to the people residing in that area.

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<sup>2</sup> *Tehri Bandh Virodhi Sangharsh Samiti v State of UP and Others*, 1990 (2) SCALE 1003

Base on the fact and circumstances of the case, the Court came to the conclusion that the Union of India had considered the question of safety of the project in various details more than once and that it had taken into account the reports of experts on various aspects. The safety aspect was clearly envisaged in the report at the time of its environmental clearance. In the circumstances, the court held that it was not possible to hold that the Union of India had not applied its mind or had not considered the relevant aspects of safety of the dam.

The court dismissed the petition and said that there was no evidence that the construction was not following environmental guidelines. The verdict was passed down by three judges who voted two-to-one against the petitioners.

#### **4. Sethusamudram Canal Project**

Sethu Samudram is the sea that separates Tamil Nadu, India from Sri Lanka. It encompasses the Gulf of Mannar the Palk Strait, a shoal of islands and bays that separate them called Adam's Bridge. The sea is quite shallow, with a depth of less than 10 meters across most of its extent. Much of its seabed consists of limestone rock. It formed part of a land bridge that joined Sri Lanka to the continent of Asia during the last ice age.

The coastline of India does not have a continuous navigation channel connecting the east and west coasts. Currently the ships coming from the west coast of India and other western countries with destination in the east coast of India and also in Bangladesh, China etc have to navigate around Srilankan coast. The existing water way is shallow and not sufficient for the movement of ships. This is due to the presence of a shallow region known as Adam's bridge, located southeast of Rameswaram near Pamban, which connects the Talimannar Coast of Srilanka. In order to reduce the distance between the East and West Coast of India and to improve the navigation within territorial waters of India, a navigation channel connecting the Gulf of Mannar and Palk Bay through north of Adam's Bridge was proposed, which is known as the Sethusamudram Shipping Canal Project (SSCP).

The SSCP proposes linking the Palk Bay and the Gulf of Mannar between India and Sri Lanka by creating a shipping canal. Under the proposed project, two channels are to be created - one across north of Adam's Bridge (the chain of islets and shallows linking India with Sri Lanka) South - east of Pamban Island and another through the shallows of Palk Bay, deepening the Palk straits.

In 1997, Ministry of Surface Transport made Tuticorin Port Trust (TPT) the Nodal Agency for this project. The Initial Environmental Exam of the project was done by National Environmental Engineering Research Institute (NEERI), Nagpur (a Central Government Agency), in 1998, as directed by the TPT. NEERI

recommended securing a major marine project and a full scale, 'Environmental Impact Assessment'.

The Initial Environment Examination (IEE) of the project prepared by NEERI indicated that the project is environmentally safe with negligible effect on the ecosystem and the Marine National Park of the Gulf of Mannar. The report also recommended a particular alignment of the canal cutting the Pamban Island, east of Kodandaramasamy temple, which would cause least damage to the biological data and the environment. As concluded in the IEE study, the Sethusamudram Ship Channel Project falls under category 'A' of the World Bank Classification requiring full scale Environment Assessment.

NEERI submitted their first report on Rapid EIA in October 2002 on existing status of Environment suggesting a viable of the Channel. NEERI have also projected a fresh scenario of dredging the Channel to only 7m depth with its economic gains, number of transit per annum etc. worked out by the shipping Corporation of India. The rough cost for dredging to 7m depth was indicated by NEERI as Rs.200 crores resulting in a saving of Rs.68 crores in bunkering and ship time per annum. NEERI presented the 7-m depth scenario with the Channel alignment further shifted eastwards to cut the Adam's Bridge to start with and suggesting to take up the project in phases.

The provisional executive summary of EIA was submitted by NEERI in May 2004 to the Nodal Agency, TPT along with a techno-economic feasibility report. A Detailed Project Report (DPR) was also submitted in 2004 by Larsen and Toubro of India and Rampaul of Denmark, the fixed contractors of SSCP.

Environmentalists fear that there are two ways in which the plying of ships could endanger the ecology. Dredged spoil dumped in the vicinity of the islands could cause mass, suspended sedimentation. The canal would cause a change in the magnitude and direction of currents in the Gulf of Mannar because it will be 300 metres wide, and the changed currents will flow towards the 21 islands. If the canal is excavated, it will slice through the Gulf of Mannar and the Palk Bay, both of which are closed marine systems, and cause irreversible damage to a variety of marine life there. The Gulf of Mannar and the Palk Bay are akin to large lagoons, undisturbed by ship traffic because of their shallow waters. They are home to a wide variety of marine ecosystems. The Gulf of Mannar alone boasts 3,268 species of flora and fauna, including 377 species that are endemic to the region. The region provides livelihood to the families of several lakhs of fishermen in 140 coastal villages in Ramanathapuram and Tuticorin districts of Tamil Nadu.

The EIA report acknowledges that the Gulf of Mannar and the Palk Bay, covering 10,500 sq km, "are biologically rich and rated among the most highly productive seas of the world". Their biodiversity is considered globally significant. The Gulf

of Mannar has been categorised as a Biosphere Reserve and its 21 islands have been declared National Marine Parks. What has alarmed environmentalists is the EIA report's observation that "there is apprehension that hard strata will be encountered in the Palk Bay/Palk Strait area" and "if the bottom strata turn out to be rock... blasting might be required". If the hard rock is blasted, the shock waves will kill the entire fish population in the area. The dolphins, whales and dugongs that reside in the area are sensitive to sound and they depend on echolocation for capturing food and for navigation. The sound produced by the blasting will drive them away.

According to environmentalists, there are many coral beds in the region. The coral beds, which are sensitive biological entities, contribute to the fishery wealth. Destruction of the coral reefs will have an impact on fishery. The NEERI report claims that "the canal may facilitate the movement of fishes and other biota from the Bay of Bengal to the Indian Ocean and vice versa. By this way, the entry of oceanic and alien species into the Palk Bay and the Gulf of Mannar, as also the dispersal of endemic species outside the Palk Bay and the Gulf of Mannar could occur." About this, the environmentalists say that such a claim has not been supported by any scientific data. From one ecological niche to another ecological niche, fish cannot and will not migrate. Hence changes in their habitat will kill them. Environmentalists also find it odd that Ministry for Shipping is backing the project by comparing it with the Suez Canal or the Panama Canal. They point out that the Suez Canal was cut in a desert. Neither biodiversity nor coral reefs nor fisheries were affected. It is a different ball game here, they say.

Other major issues that pertain specifically to the EIA report are:

The Presence of Corals along the proposed ship canal alignment in Adam's Bridge area has not been observed.

It is also intimating us that ecological important species along the proposed alignment is not significant.

The report has not assessed the affected population on Land Acquisition and Resettlements.

6 Km<sup>2</sup> areas in the sea floor of Adam's Bridge will be permanently lost.

Report instruct to control over marine pollution.

Dispersal could occur to alien rare species in proposed alignment.

Dhanushkody areas traditional fishing will be totally affected.

It is also estimated that, 84.5 million cubic meter of sand and spoil would be dredged from the project area. Out of this, a small quantity will be discharged in Pamban Island and the remaining in Bay of Bengal. Here we want to know, a) whether Neeri has worked out the 'under current' of sea water on the excavation area as well in discharging area. b) It is also not mentioned the exact location, where the dredged materials going to be discharged in Bay of Bengal.

In the EIA report, under 6.1, 'construction phase', it is said that the dredged sand and spoil will be discharged in Pamban & Bay of Bengal. Contradictory to this statement, in the same EIA report, in 6.2, 'operational phase', it is reporting that dredged materials will be mostly silt and clay and will not be disposal in sea.

NEERI asking a strict vigilance of crude oil tankers to avoid oil spill in the sea. If oil spill happened due to unavoidable circumstance, the agency has not suggested any remedial measure.

The Agency suggesting that a trained pilot or environmental watcher should be board in the ship to watch marine mammals. Is this suggestion is possible in practical day-to-day life. Say for e.g., if a vessel sail during night or in rainy or in dark cloudy day, this suggestion will be a meaningless one.

The most important criticism to the entire project is that the EIA study did not consult a main stakeholder, Sri Lanka. Hence, the EIA is fundamentally flawed. It has also been pointed out that NEERI has not considered the most important international instruments, UN Law of Sea Convention 1982 and its 2 protocols anywhere in its report.

It is argued that the studies carried out for a project of such magnitude is minimal. The EIA was conducted in a hurried fashion and was of a nature of rapid assessment. Any oceanographic modeling carried out has been after the EIA was completed. Hence, the studies are incomplete and inadequate. On the other hand, defenders of the project have argued that the SSCP will have only minimal effects on the ecology of the region as environmental viability of different canal alignments has been looked into and the most viable route has been chosen. Only then was the techno-economic feasibility report finalized.

Experts also claim that the project would violate the UN Law of Seas Convention, 1982. Some Articles of the Convention that may be deemed violated are:

- Part II, Section2, Article 6 deals with Reefs, Article 9 tells on Mouths of Rivers, Article 10 speaks about Bays.
- Part V, Article 61 - Conservation of the living resources, Article 64 - Highly Migratory species.
- Part V, Article - 65 and Part VII, Section 2, Article 120 also speaks on Marine

Mammals.

- Part VII, Section 2, Article 116 speaks on fishing rights.
- Part XI, Section 2, Article 145 and Article 237 emphasizing that protection of Marine Environment is obligatory. In the same part Article 146 urges the need for protecting the Human life, Article 149 and Part XVI, Article 303 both deals with Archaeological and historical objects.
- Part XIII, Section 3, Article 254 dealt with Rights of neighboring land-locked and geographically disadvantaged States. Dispatch

## **5. Polavaram Dam Project**

The Polavaram Dam project was conceived during the colonial rule in India. The British conducted a survey on the Godavari and identified Polavaram as the best point for tapping the mighty river. The then chief secretary of the Madras State (of which Andhra Pradesh was a part) Sonti Ramamurthy named the project "Sriramapada Sagar" keeping in mind that the reservoir of the project would extend up to the feet of Lord Rama at Bhadrachalam. After a few years the project was renamed as Sri Sitaramapada Sagar. The project, however, did not take off at that time.

In 1980 that the then Chief Minister of Andhra Pradesh, T. Anjaiah, laid the foundation stone for the project. The project was called it "Polavaram Project", Polavaram, being a closest town in West Godavari district of Andhra Pradesh. There were several other attempts later on to change the project name by various political leaders by naming it as "Godavari Srujala Sravanti Project" and the "Indira Sagar Project".

The Polavaram dam project is located in the northern part of Andhra Pradesh, straddling portions of the adjoining states of Chhattisgarh and Orissa. After the revival of the project in 1982, the project was finally given green signal in 2002 by the then state government. However, the project, which was now proposed to be implemented with certain modifications had outdated design and did not fully take into consideration the damage likely to be caused to the ecology, environment, wild life and human habitations and many changes that have taken place in the society over the years since it was conceived.

Under the Environment Protection Act, 1986, all major projects, in sectors such as hydroelectric, mega power and mining, have to get an environmental clearance, which is based on an environmental impact assessment. Environment clearance for the project was granted by MoEF (Ministry of Environment & Forests) in October 2005.

The people of the project area are divided into two violent groups, one for implementation of the project as it provides irrigation facilities and power supply

for their development and the other affected people opposing the project, as they feel that they are being forced into inhuman conditions, depriving them of mother earth, their traditions & culture and peaceful way of life.

Several NGOs and peoples organisations have resisted the dam since mid eighties on ecological, economic and social grounds. It is feared that the project will bring misery to more than 1.5 lakh people, by submerging and displacing 276 villages, predominantly tribal villages in an area of about one lakh acres including forest land. Expert estimate that the proposed displacement of such huge population by uprooting them from their traditional and natural habitats is likely to cause degeneration in their lives as they will be forced to become migrant labourers and urban slum dwellers.

The Polavaram Project EIA Report was prepared way back in 1985 after which the project was stalled till 2002 due to some political reasons. The report stated that about 1,50,697 people are expected to be displaced from 226 villages. However, since then the population has grown considerably. The data contained in executive summary of EIA report made available regarding number of villages and population to be displaced also does not tally with 2001 census figures and is far from ground realities. Some experts also state that the present EIA Report does not appear to be comprehensive and contains inadequate or misleading data; the authenticity of the report is questionable and needs to be put to a thorough scrutiny.

A petition was filed on these grounds by Legal Initiative for Forest and Environment, a non-profit agency based in Delhi, challenging the environment ministry clearance of the project. The project had also been opposed by Orissa and Chhattisgarh right from the beginning as they felt that they will not be benefited by the project at all. They had also filed a suit in 2006 in the Supreme Court, petitioning that work on the project be stopped.

An appeal against the clearance (by MoEF) was filed by Dr R Sreedhar of the Academy for Mountain Environics and represented by Ritwick Dutta, Advocate. The National Environment Appellate Authority (NEAA) is the only competent authority set up by Parliament through an Act to hear appeals from aggrieved/affected persons against the grant of environmental clearances by the MoEF to different projects across the country. Hence the matter came into consideration of NEAA (the statutory body empowered to hear appeals challenging environmental clearances).

The project was opposed on grounds of inadequate EIA; also, no public hearing was conducted in the states of Orissa and Chattisgarh despite the fact that 3000 families were to be affected by the proposed construction. During the hearing both

the states contended that environmental clearance was granted by MoEF without considering the opinion of the states, though they were affected.

By its order dated December 19, 2007, the NEAA quashed the environmental clearance granted by the MoEF to the Polavaram Multipurpose project. NEAA maintained that the clearance given by the Union environment ministry was done without giving an adequate hearing to all the people likely to be displaced and hence it was unacceptable and improper. The authority observed that the environment ministry clearance was given without giving a public hearing to the people residing in the affected areas of Orissa and Chhattisgarh was a violation of the “principles of natural justice.” The NEAA order passed by a bench comprising of Dr I.V Manivannan, JC Kala, and Kaushlendra Prasad, stated that, “Neither did the affected persons have any access to the executive summary of the project in the notified place, nor did they have any opportunity to participate in the public hearings... the question here is not one of majority or minority but it relates to the issue of enabling all the affected people to express their views, whether they reside in one particular state or two or more states,” the order stated.

NEAA in its order states, "The appeal is partially allowed to the extent that the impugned Environment Clearance order No J -12011/74/2005-IA I dated 25-10-2005 issued by Respondent 1 (MoEF, Government of India) is quashed on the grounds that the impugned order was passed without taking into consideration the public hearing which by itself was incomplete as it was not conducted in the affected areas of Orissa and Chhattisgarh resulting in denial of access to information and opportunities to the affected people to express their views/opinion etc. on the environmental impact of the project and consequential violation of principles of natural justice”.

## **II) Other Infrastructure Development Projects**

### **1. *Goa Foundation v Konkan Railways Corporation***

A writ petition was filed in the Bombay High Court by a Society asking the Court to compel the Railway Corporation to procure the environmental clearance and get the EIA done from the MoEF under the EPA, 1986 for the part of alignment passing through Goa.

In this case (*Goa Foundation v Konkan Railways Corporation*, AIR 1992 Bom. 471), the petitioner claimed that the proposed alignment is wholly destructive of the environment and the ecosystem and amongst other things, violates Art. 21 of the Constitution of India. The grievance of the petitioners was that the proposed alignment was planned and undertaken without an adequate EIA and Environment

Management Plan. The petitioner also claimed that the Corporation had violated the CRZ notification.

The Court after review the argument and the facts presented before it, refused to exercise its writ jurisdiction over a matter of national importance and significance. It was of the opinion that the extent of damage is negligible and public project of this kind will fulfill the long standing aspirations of the people on the west coast. The project is an important development for the economic and social structure of the western people.

## **2. Vasant Kunj Shopping Mall and Corporate Offices**

The under-construction shopping malls and corporate offices in the Vasant Kunj area, cumulatively worth over 1,000 crore were allegedly cleared without the mandatory EIA. The Supreme Court had stayed the construction at these project sites following allegations that the projects had been cleared without EIA clearance as envisaged in the July 7, 2004 notification of the Centre.

The stay order came in response to the petitions filed by two different citizens' groups— Citizens for the Preservation of Queries and Lake Wilderness (CPQLW) in January 2004 in the Forest Bench of the apex court and the Ridge Bachao Andolan in November 2005.

The Supreme Court stayed work on Vasant Kunj mall complex until it receives an Environment Impact Assessment (EIA) report from the MoEF.

A bench headed by Justice Arijit Pasayat and Justice S.H.Kapadia, while directing the Ministry to submit the report in two months, also asked it to find out if constructions by the Army in the area also need an EIA.

The mall owners were asked to furnish the project documents required under the EIA and also a report of a public hearing conducted by the Delhi Pollution Control Board.

In response, the MoEF submitted an affidavit saying no new project could be undertaken without an EIA if it has an investment of over Rs 50 crore, discharges over 50,000 litres of sewage per day or houses more than 1,000 persons. And, all the seven projects coming up in Vasant Kunj area in the Rs 1,182 crore complexes on a 92-acre plot bought at a 1992 DDA auction fulfill either one criteria or all.

Further, activists had said that all the seven projects fall under the protected Ridge area and is a vital groundwater recharge zone. It was alleged that these

constructions posed a grave threat to the Ridge, the lung of Delhi where concrete jungles have been spreading due to pressure on housing.

After the court had asked the MoEF to examine the matter and report back, the expert committee of the Ministry held inquiries and meetings with the project contractors and found that all, except ONGC, had started construction at the sites.

The Ministry, informing the court about this through an affidavit filed by advocate AND Rao, stated that there was little that could be done in these cases except taking damage control measures, since all proponents except ONGC had already commenced construction in violation of the July 7, 2004, notification. Therefore, at this stage only damage control is possible by effective environmental management plan measures and systematic solutions.

The the affidavit reflecting the views of the expert committee also suggested to consider imposing penalty on the project owners (by Ministry) for commencing construction work before obtaining environmental clearance. It also said that proposals could be considered for regeneration of a forest and biodiversity park in the area.

However, the committee did put the blame on Delhi Development Authority (DDA) for not coming out with a cumulative impact assessment and corresponding management/mitigation measures. It was of the unanimous view that the biodiversity park, adjacent to these huge projects, should be conserved and protected at all costs as it noticed several lacunae relating to water, traffic and power management plans for the projects. Of the seven projects, some are shopping malls and some are corporate offices. The project owners are Maruti Udyog Ltd, Ambience Developers Pvt Ltd, Regency Park Management Ltd, Beverly Project Pvt Ltd, Jasmine Project Pvt Ltd and ONGC and ONGC Videsh Ltd.

During the public hearing, many questions were raised on the role of the Delhi Development Authority and Delhi Jal Board (DJB). Giving an example, the committee said that there was no guarantee of water supply to the project, though DDA said that DJB would supply the water. Mentioning several shortcomings in the sanction of plans, the committee was of the view that plots no.6 and 7 of the Vasant Kunj Shopping Mall site should not be auctioned by DDA till systemic solutions were in place.

Even the Defence Ministry is engaged in construction activities in the eco-fragile Vasant Kunj Ridge area of South Delhi in violation of environmental norms, MoEF told the Supreme Court. In the affidavit filed in the court, the Ministry said that Defence Ministry was constructing three buildings in the Vasant Kunj Ridge

area which attracted the provisions of Environment Impact Assessment (EIA) Notification (as amended on July 7, 2004).

However, the petitioners opposed expert committee's damage-control stance and sought stay on constructions in Army area as well. The Supreme Court gave the MoEF more time to submit a final clearance report on the controversial Vasant Kunj Malls. The case is still ongoing and the final verdict is yet to come.

### **3. Academy for Mountain Enviroincs v. State of Orissa and Others**

Kalahandi, which is a one of the districts of Orissa has rich deposits of bauxite over its hill ranges. A few years back the Orrisa State Government and Orrisa Mining Corporation entered into agreement with certain industrial houses for creating infrastructure to extract bauxite and process it.

Vedanta Alumina Limited, a subsidiary of M/s Sterlite Industries (India) Ltd proposed a one million tonne per annum capacity alumina refinery project together with a 75 MW coal based captive power plant at an estimated cost of about Rs. 4000 crores at Lanjigarh, District Kalahandi, Orissa. The bauxite for the refinery was to be sourced from the Niyamgiri Hills, Lanjigarh. The Alumina refinery was granted environmental clearance without linking the project with the Mining.

M/s Sterlite (the parent company of M/s Vedanta) applied for environmental clearance on 19.03. 2003 to the MoEF. In the application, Vedanta stated that no forestland is involved and that within the radius of 10 kms there is no reserve forest. M/s Vedanta thereafter on 16.08.2004 applied for use of 58.943 ha forestland consisting of 28.943 ha village forest and 30 ha reserve forest. However, the application for environmental clearance was not modified and the same was processed on the premise that no forestland is involved. Further, since mining at Lanjigarh was integral part of the Alumina refinery project, Vedanta could not have started the work on the Alumina refinery without getting the clearance for mining also. As per the guidelines of the MoEF - *“for projects requiring clearance from forest as well as environment angles, separate communications of sanction will be issued, and the project would be deemed to be cleared only after clearance from both angles...”*

M/s Vedanta requested the MoEF to grant environmental clearance for the Alumina Refinery Plant stating that it would take three years to construct the refinery plant whereas mines can be opened up in one year. In its application for seeking environmental clearance for the project dated 19.3.2003 it is stated that “nil” forestland is required for the alumina refinery and that within a radius of 10 km of the project site there is no reserve forest, which is contrary to the facts on record. Subsequently, on 16.8.2004 a proposal for allowing the use of 58.943 ha

forestland, consisting of 28.943 acre of “Gramya Jungle Jogya” land and 30 ha of reserve forest, was moved under the Forest Conservation Act through the State Government to the MoEF. Out of the above, 26.123 ha forestland was required for the refinery, 25.82 ha for the mine access road and the balance 7.0 ha was required for the construction of the conveyor belt for the transportation of the mineral from the mine site to the plant.

The MoEF gives environmental clearance for Alumina Refinery Project by delinking it with mining project. In the environmental clearance it is stated that no forestland is involved, even though the application under the Forest Conservation Act was still pending.

*As per the guidelines laid down by the MoEF “Some projects involve use of forest land as well as non-forest land. State Governments / Project Authorities sometimes start work on non-forest lands in anticipation of the approval of the Central Government for release of the forest lands required for the projects. Though the provisions of the Act may not have technically been violated by starting of work on non-forest lands, expenditure incurred on works on non-forest lands may prove to be infructuous if diversion of forest land involved is not approved. It has, therefore, been decided that if a project involves forest as well as non-forest land, work should not be started on non-forest land till approval of the Central Government for release of forest land under the Act has been given”.*

However, Vedanta started the work on Alumina Refinery in blatant violation of this provision.

An application was filed before the Central Empowered Committee (CEC) against establishment of the Vedanta Alumina project by Shri Biswajit Mohanty of Wildlife Society of Orissa, Shri Prafulla Samantara and Academy of Mountain Environics and its Fact Finding Mission along with the legal support of an organization called LIFE.

The CEC which was appointed by the Hon’ble Supreme Court of India in the Godavarman case and has the broad task of monitoring and ensuring the compliance of the orders of the Supreme Court concerning the subject matter of forests and wildlife and other issues arising out of the said order, gave its recommendations to the Hon’ble Supreme Court of India in this particular case. The CEC was of the opinion that that the Hon’ble court should consider revoking the environmental clearance dated 29/09/04 granted by the MoEF for setting up of the Alumina Refinery Plant by M/s Vedanta and directing them to stop further work on the project.

The CEC report highlights the concerns of the petitioners that “the alumina plant and the mining project linked with it will have serious adverse effect on the flora and fauna due to mining, overburden dumping, construction of proposed road through the dense forests, liquid and gaseous effluents emissions, bright illumination, blasting with explosives, drilling and resultant vibration and dust, operation of heavy loading and unloading equipment, pollution etc.”

In the report, CEC also accepted the questions of the petitioners regarding the very validity of the environmental clearance granted on the following grounds:

- a) “Out of the land requirement of 723.343 ha. for the alumina refinery and 721.323 ha. for the bauxite mining, 58.943 ha. and 672.018 ha., respectively are forest land. The government revenue land and the private land also contain thick forest and therefore are eligible for classification as “forest” as per the Hon’ble Court’s orders dated 12.12.1996;
- b) Since the project involved the use of the forest land for the alumina refinery itself, the environmental clearance could have been granted by the MoEF only after the use of the forest land was permitted under the F.C. Act. Similarly, the environmental clearance for the alumina refinery could not have been accorded without taking a decision on the mining component which is an integral part of the project;
- c) M/s Vedanta has deliberately and consciously concealed the involvement of the forest land in the project. In the acquisition notice dated 6.6.2002 issued by the District Collector, Kalahandi it is clearly mentioned that 118 acre of forest land is included in the project site. In the application made by M/s Vedanta for the environmental clearance and also during the examination of the proposal, this vital fact was concealed so that environmental clearance is not kept pending for want of the F.C. Act clearance;
- d) In violation of the F.C. Act guidelines, the project has been split into alumina refinery project and bauxite mining project even though the bauxite mining is an integral part of the refinery project. Though the MoEF was fully aware that the use of the forest land for the mining at Niyamgiri hills is absolutely necessary if the alumina refinery is to be established at Lanjigarh, the environmental clearance to the alumina refinery has been accorded by the MoEF by overlooking these facts;

- e) At the time of the grant of the environmental clearance even the proposal under the F.C. Act for the use of the forest land for the Niyamgiri bauxite mines had not been filed with the MoEF;
- f) The construction work of the alumina refinery was started on the project site much before the environmental clearance which was accorded on 22<sup>nd</sup> September, 2004. This will be evident from the annual reports and the other documents filed before the CEC. As per the statements given by the Company, 45 % of the work had been completed by 31<sup>st</sup> March, 2005 i.e. within 4 months and an amount of US \$ 29 million had been spent.”

The basic issue of the case which is the delinking of the mining and alumina refinery project and obtaining *separate clearances* for both has been vehemently criticized by the CEC. Even the Environmental Impact Assessment (EIA) Report of the Refinery project prepared by Tata AIG Risk Management Services itself recognized that mining and refinery components of the project are linked to each other and need to operate in tandem. Hence it has been asked time and again as to why break up the project components was made when total clearance for both components is legally required.

Furthermore, the CEC highlighted that area allocated to company forms part of Schedule V area as specified by the Constitution. Schedule V provides protection to the adivasi people living in these areas. No land in these areas is allowed to be transferred to non tribals. The case is still pending and the CEC report prepared against mining has been sent for the perusal of the Hon'ble Supreme Court.

**Environmental Impact Assessment for  
Proposed Sethusamudram Ship Channel Project**

by

***National Environmental Engineering Research Institute***

**Nehru Marg, Nagpur - 440 020**

August 2004

**Executive Summary**

**Introduction**

India does not have, within her own territorial waters, a continuous navigable route around the peninsula due to the presence of a shallow (1.5 to 3.5 m depth) ridge called 'Adam's Bridge' between Pamban island on south-eastern coast of India and Talaimannar of Sri Lanka. While Rameshwaram is a major pilgrim centre on Pamban island, the tip of the island is marked by Arimunai. Consequently, the ships calling at ports on the east coast of India have to go around Sri Lanka entailing an additional distance of about 254-424 nautical miles and about 21-36 hours of ship time.

The Sethusamudram Ship Channel Project under the consideration of the Ministry of Shipping, Government of India, envisages creation of a ship navigation channel to suit different draughts (9.15 m, 10.7 m and 12.8m) through dredging/excavation in Adam's Bridge, parts of Palk Bay and Palk Strait. The navigation route will originate from the Tuticorin new harbour in the Gulf of Mannar (GOM) using available navigation depths (> 20 m) up to south east of Pamban Island, pass through a channel created in Adams Bridge within the International boundary and proceed parallel to the International Medial Line for fishing rights as the Bengal Channel. In Palk Bay area availability of depths in middle channel, capital dredging across Adams Bridge and in Palk Strait and continuous maintenance dredging along the proposed transit are the critical project related issues.

The routes selected through earlier studies particularly in Gulf of Mannar area have been rejected, keeping in view sensitivity along the coastal stretch of GOM harbouring marine national park. Instead a navigation route keeping a minimum 6-8 km distance from Van Tiu near Tuticorin and more than 20 km from Shingle in Adams Bridge approach area has been suggested.

Tuticorin Port Trust (TPT), the nodal agency identified by Ministry of Shipping, Govt. of India for the implementation of the project in pursuance of its decision to incorporate environmental considerations in the design phase of the project, retained, in March 2002, National Environmental Engineering Research Institute (NEERI) to conduct the Environmental Impact Assessment (EIA) study for the project.

This report presents briefly the project setting, describes the baseline environmental status of the project area, identifies environmental issues, predicts and evaluates impacts due to the proposed project and delineates environmental management plan to mitigate potential adverse impacts.

The EIA study has primarily drawn upon the available information on the proposed project, the hydrography, marine water quality and ecological resources in the project area, and the primary data generated during the course of study. This environmental impact assessment study with intensive data collection has resulted into fuller description and appreciation of the natural processes occurring in the study area, and delineates the environmental consequences including the ecological risk associated with the proposed project with or without proper environmental management plan.

## **Project**

The proposed Sethusamudram ship channel will have two legs, one near the Point Calimere called the Bay of Bengal Channel and the other across the Adams Bridge. The Bay of Bengal Channel traverses the Palk Bay wherein the sea-bed is mostly soft to hard clayey-sand in nature. Some hard strata has been reported beneath the soft sand during recent survey by the National Hydrographic Office, Dehradun. The area adjoining Adma's Bridge, Dhanushkody Peninsula on the North and the South is reported to be sandy by National Ship Design Research Centre (NSDRC), Visakhapatnam during their survey in connection with this project.

While navigational depths will be used in Gulf of Mannar from Tuticorin Port to Adam's Bridge area, a 20 km long, 300 m wide channel with 10.7 m draught with two way controlled traffic is proposed to be created as ultimate phase by dredging shallow area of Adam's Bridge upto 12 m depth. Similar excavation will be done in Palk Strait and adjoining parts of Palk Bay to achieve the required depth over a stretch of around 36 km and 18 km respectively. A control station, administrative building and Vessel Traffic Management System (VTMS) is proposed to be located at Rameswaram island between Dhanushkodi and Koil Nagar village to control navigation, besides other infrastructure including administrative requirements.

## **Environmental Regulations**

At the National level, the environmental clearance to the project is subject to compliance with the stipulated safeguards under the provisions of Environment (Protection) Act, 1986; Forest (Conservation) Act, 1980; The Water (Prevention and Control of Pollution) Act, 1974; The Water (Prevention and Control of Pollution) Rules, 1975; The Water (Prevention and Control Pollution) Cess Act, 1977. The Water (Prevention and Control of Pollution) Act, 1981; and other rules and regulations in force. Land use on the coastline will be subject to regulation as per the Coastal Regulation Zone (CRZ) Notification issued by the Ministry of Environment and Forests (MoEF), Government of India in 1991 and subsequent amendments under the Environmental Protection Act. This notification is administered by the State Department of Environment and Forests.

The Wildlife (Protection) Act of India (1972) provides legal protection to many marine animals including reef associated organisms. Chapter IV of this Act dealing with Sanctuaries, National Parks etc. is equally applicable to marine reserves, marine national parks and biosphere reserves.

The Gulf of Mannar Marine Biosphere Reserve (GOMMBR) has been notified in 1989 through an executive communication from the Secretary to the Government of India, Ministry of Environment and Forests to the Chief Secretary, Government of Tamil Nadu.

During the operational phase of the project, the most important instrument to be complied relates to the International Convention for the Prevention of Pollution from Ships 1973 as modified by the Protocol of 1978 (MARPOL 73/78) for which India is a signatory.

## **Key Findings**

### **Environmental Status**

#### **Marine Environment**

The Palk Bay and the Gulf of Mannar covering an area of 10,500 sq. km in which the proposed ship channel is to be created are biologically rich and rated among the highly productive seas of the world. Its diversity is considered globally significant. In the Gulf of

Mannar, between the coast line and the proposed alignment, there are 21 islands which have been declared as National Marine Parks by the Tamil Nadu Forest Department and the MoEF, Government of India. While the proposed channel alignment in the Tuticorin Port area shall be about 6 km from Van Tiu the nearest island, in Adam's Bridge area it will be about 20 km from Shingle Island which is a part of National Marine Park.

The data on physico-chemical characteristics and marine biological resources was collected from various sampling stations in Gulf of Mannar and Palk Bay. Primary data on physico-chemical characteristics of marine water shows no significant variation in alkalinity (102-106 mg/l) and pH (8.0-8.2) along the proposed channel alignment. The DO values varied from 3.2 to 5.7 mg/l and the silicates from 0.003 mg/l to 0.017 mg/l. No significant variation in salinity is observed between surface and bottom samples. An inverse relationship between salinity and silicates has been observed. The nitrate concentrations vary from 0.78 mg/l to 1.1 mg/l. Data from secondary sources in coastal areas of Palk Bay near Palk strait shows pH ~ 8.2, D.O. 5.8-6.5 mg/l and Total nitrogen content of 0.4 mg/l.

Sediment samples collected along the proposed channel alignment show the presence of organic carbon, total nitrogen, total phosphorous and sulphates in concentrations adequate for biological growth. Almost all the sediment samples show presence of oil & grease. The concentrations of heavy metals are high in some of the sediments in the Palk Bay as compared to other locations.

### **Biological Resources**

The gross primary productivity along the proposed channel alignment vary from 142 to 472 mgC/m<sup>3</sup>/day indicating that the Gulf of Mannar and the Palk Bay are biologically productive regions. The zooplankton are dominated by copepod. Macrobenthos represented by 78 varieties exhibit fairly good diversity. The meiofauna comprised larval polychaetes, nematodes and worms.

The corals along the proposed channel alignment in Adam's Bridge do not exist though major groups of biological resources like sea fan, sponges, pearl oysters, chanks and holothuroids at various sampling points have been recorded. In general, the density of economically/ecologically important species along the proposed alignment is not significant.

All the three groups of prochordata organisms, considered as the connecting link between invertebrates and vertebrates, viz., hemichordata, cephalochordata and urochordata comprising 1, 6 and 59 species respectively have been recorded around the islands of the Gulf of Mannar.

There are 87 fish landing stations between the south of Point Calimere and Pumban in the Palk Bay, and 40 stations in the Gulf of Mannar between Pamban and Tuticorin. Out of over 600 varieties of fishes recorded in this area, 200 are commercially important. During 1992-1996, the fish production has increased gradually from 55,325 tonnes in 1992 to 2,05,700 tonnes in 2001.

### **Biodiversity**

Non-conventional fishing in the region is represented by pearl, chank, sea weeds, ornamental shells and holothurians. There has been a declining trend in the production of these organisms as evidenced by the revenue received by MPEDA.

Rare and endangered species of sea turtle, dolphin, sea cow and whale are recorded in the Gulf of Mannar and the Palk Bay. The sea cow inhabitates the shallow shore regions where grasses occur, while other endangered animals mostly prefer deep sea.

Several species of green algae (32), brown algae (35), red algae (59), blue green algae (3) and sea grasses are recorded in the Gulf of Mannar and the Palk Bay. A few of the 21 islands are reported to possess patches of mangroves predominated by *Avicennia* sp. And *Rhizophora* sp.

Most of the habitats of the sensitive biota, viz., corals, pearl oysters, chanks, sea cow, holothuroids and marine algae are along the coast and around the 21 islands, and mostly away from the proposed canal alignment.

Point calimore wild life sanctuary sprawling over 17.26 sq. km. Area comprising tidal swamp, dry evergreen forests and mangroves is located in coastal areas of Palk strait in Nagapattinam District. The sanctuary is bestowed with population of varied wildlife such as Chital, Wild Bear, Bannet, Macaque, Black Buck, Flamingoes, Teals, Gulls Terns, Plovers and Stilts, Dolphins and Turtles are seen close to shore area.

### **Land Environment**

Based on an analysis and interpretation of IRS IC LISS-III satellite data, merged with PAN data, degraded area in Pamban island has been delineated for anticipated disposal of dredged material to the extent possible with prior approval under CRZ regulations. A large stretch about 753 hectare, of such land between Rameshwaram and Dhanushkody is available.

There are no archaeologically significant structures along the proposed channel alignment. However, there are apprehensions of encountering cultural/ archaeological artifacts during the excavation of the channel though borehole data generated by the National Ship Design Research Centre (NSDR) does not support such a situation.

### **Socio-economic Environment**

Along the coast in the Gulf of Mannar and the Palk Bay there are 138 villages and towns belonging to 5 districts. The socio-economic profile of the fishermen in the villages of Gulf of Mannar coast is low, and more than 40% of families are in debt. The local people are of concern that the creation of channel would result in the reduction of their income due to fishery.

### **Oceanographic Status**

The hydrodynamic studies of the seabed in Adam's Bridge and its adjoining area have been carried out in May 2003 and February 2004 by retaining the services of National Ship Design Research Centre (NSRDC), Vishakhapatnam. The hydrographic charts bearing nos. 1584, 1586, 1587, 2069, 2197 and 96 have been referred while conducting the surveys.

There are two circulations of water masses observed in the Bay of Bengal, the clockwise circulation in south-west monsoon and the counter clockwise circulation in the north-east monsoon. The tidal variations are between 0.05 to 0.7 m. The current velocities in the Palk Bay and the Gulf of Mannar are as mild as 0.2 - 0.4 m/s except on few days during south-west monsoon when it rises upto 0.7 m/s. Water currents follow the directions of predominant winds. The analysis of current data shows no potential threats to siltation of channel. It is observed that during southwest monsoon the sediments move from Gulf of Mannar to Palk Bay and during fair weather the direction reverses. In annual cycle, a net exchange of 6000 m<sup>3</sup> of sediment is found to move from Palk Bay to Gulf of Mannar through Pamban pass and 25000 m<sup>3</sup> of sediment moves from Gulf of Mannar to Palk Bay through Arimunai.

Geological strata in Adam's Bridge area shows soft and hard sand upto 12 m with particle size varying from 65 to 600 µm. The bathymetry varies from 0.6 to 6.3 m. Depth in Palk strait averages to about 8 m.

The hydrographic survey of Palk Bay and Palk strait area has been carried out during Jan. 25 - Feb. 18, 2004 by the Naval Hydrographic Department of National Hydrographic Office (NHO). According to the findings of NHO, the seabed in this region comprises of sand and mud with few broken shells. The depth contours in the sea are in agreement with those depicted on the existing navigational chart no. 358. While navigable depth (more than 12 m) will be used in about 78 km stretch in Palk Bay, a sizable stretch (about 54 km) will require to be dredged in Palk Strait and adjoining area. Sub bottom profile studies indicate that though the upper layer of sediment is made up of mud and sand, there is some hard strata under the soft sediment. This hard strata if discovered to be rock, it would require blasting at the time of dredging to achieve the desired draught.

The tides in the area are not similar. Both semi-diurnal and diurnal tides are observed at the tidal station set up. The range of spring tides vary between 0.4 to 0.7 m. The current in the area is N-S direction with speeds varying from 0.08 to 0.8 m/s and may reach 1.8 m/s (4 kt) in spring. No wrecks and obstruction have been observed during the survey.

## **Impacts due to the Project**

### **Impacts on Landbased Facilities**

The project envisages construction of shore facilities to cater the needs of channel in Adam's Bridge area, viz. service jetties, slipways, buoy yard, repair workshop as also staff and administration buildings for facilitating regulated traffic in the vicinity of Adam's bridge area. The locations of land-based structures, and the extent of area required for their construction is required to be identified on Pamban island in consultation with local authorities. Most of the land east of Rameshwaram is barren and covered by sand and scant vegetation. There are few hamlets at Arimunai and Dhanushkodi who are engaged in fishing. These fisherman will be displaced in the event the land based facilities are planned in this area. Temporary displacement of these fisherman is envisaged. A BSF check post will also be temporarily affected. Land on Pamban island has also been identified for disposal of dredged material (silt / clay / sand). The land cover, landuse as also the ownership of sites required for the project related activities will be firmed up once the modus-operendi of traffic regulation in channel is finalized. Hence, the extent of land acquisition, the need for resettlement and rehabilitation of affected population, if any, can not be assessed at this juncture. However, given the fact that channel will cut across the Adam's Bridge area, the impacts on land based facilities would be negligible in comparison to that envisaged in earlier studies where land locked canal cutting through Pamban Island was proposed.

During the construction of the ship channel, it is anticipated that considerable sea-borne activity in the form of logistic and support services would take place. This would have significant adverse impact on the traditional fishing activities by the licensed fisher folk and consequently on their income levels.

### **Impacts on Productivity and Ecology in GOM/Palk Bay**

As the proposed alignment in Gulf of Mannar is more than 20 km away from the existing 21 islands in National Marine Parks in the Gulf of Mannar, the marine biological resources around these islands will not be affected to any significant level.

The existing level of primary productivity in the project area will remain practically unaltered during the construction and operation phases of the channel. There would not be any significant change in water quality including turbidity due to the proposed deployment of cutter suction/trailor suction hopper dredgers for capital and maintenance dredging.

Due to dredging the bottom flora and fauna on an area about 6 sq. km along the channel alignment in Adams Bridge and about 16-17 sq.km in Palk Bay/Palk Strait area will be lost permanently. This loss, however, will be very insignificant compared to the total area of 10,500 sq. km of the Gulf of Mannar Marine Biosphere Reserve.

In Adam's Bridge area about 38 million m<sup>3</sup> of dredge spoil comprising about 7-8 million m<sup>3</sup> clay silt will be generated for achieving 12 m depth for 300 m wide channel including allowances for slope and tolerance. It is proposed that spoil containing a mixture of clay and sand will be disposed on degraded areas of Pamban island for reclaiming the land subject to approval of Forest and Environment Department (TN) for use of area falling under CRZ as dumping of wastes in CRZ area is not permissible activity. Balance 30 million m<sup>3</sup> spoil containing mainly sand (particle size 125 µm to 600 µm) will be discharged in sea 25 km away from the dredging area keeping safe distance from medial line at depths varying from 30-40 m to minimise the impact. In the event of restricting the channel to 10 m depth to suit vessels with 9.15 m draught, the quantity of dredged spoil will reduce by 13.5 million m<sup>3</sup> and material required to be disposed in sea will be 16-17 million m<sup>3</sup> instead of 30 million m<sup>3</sup> as envisaged for 12 m depth. This would further minimize impacts on sea bed due to disposal of dredged spoil.

In Palk Bay area, about 44 million m<sup>3</sup> of dredged spoil will be generated due to excavation activity in Palk strait and Palk Bay to achieve 12 m depth for 300 m channel including allowances for slope and tolerance. The NHO data indicate hard strata beneath soft sand hence spoil may contain silt, sand and hard material. The dredging may also require blasting if hard strata is encountered. In the event of blasting, adverse impact on sea bottom fauna is envisaged. The spoil is proposed to be discharged in Bay of Bengal at suitable depth (25-40 m) to minimize impacts on coastal areas of Palk Bay. An option of using silt/clay for beach nourishment is also recommended. In the event of restricting the channel depth to 10 m the requirement of dredging in Palk Bay/Palk strait will drastically reduce to about 14.8 million m<sup>3</sup> as against 44 million m<sup>3</sup> envisaged for 12 m depth. This would minimize environmental impacts as well cost of dredging and disposal.

It would be ideal to explore the possibility of dredging the channel to 10 m depth in first phase to cater to vessels of 9.15 m draught and monitor environmental status during construction and operation phases. The proposal of 12.0 m depth can subsequently be taken up in second phase provided adverse impacts on environment are not observed.

Hydrodynamic modelling studies using Depth Integrated Velocity and Solute Transport (DIVAST) model have shown that, even for the highest spring tidal water conditions, there will be no significant change in the magnitude and direction of current velocities along the proposed alignment due to the construction of the channel in Adam's bridge area.

During the construction and operation phases of the channel, the potential sources of marine pollution are spillage of oil and grease, marine litter, jetsam and floatsam including plastic bags, discarded articles of human use from the sea-borne vessels which will have to be controlled.

The channel may facilitate the movement of fishes and other biota from the Bay of Bengal to the Indian Ocean and vice versa. By this way, the entry of oceanic and alien species into the Palk Bay and the Gulf of Mannar, as also the dispersal of endemic species outside the Palk Bay and the Gulf of Mannar could occur.

### **Socio-economic Impact**

The channel will establish a continuous navigable sea route around peninsular coast within the Indian territorial waters, reduce shipping distance by about 254-424 nautical miles and voyage

time of about 21-36 hrs as also the attendant operating costs. The channel will become a valuable asset from national defence and security point of view enabling easier and quicker access between the coasts.

Due to the construction of infrastructure in the island, the land access, now available to the local fisher folk to Dhanushkody area for traditional fishing will be hindered unless alternative arrangements are made. The dredging and shipping operations will have to be so regulated as to cause minimum disturbance to the normal fishing activities.

The project will provide employment opportunities and avenues of additional income through establishment of small ancillary industries. The project will also trigger development of coastal trade between the ports south and north of Rameswaram consequently reducing the load and congestion on railways and roadways.

The project will help in saving considerable foreign exchange through reduction in oil import bill and generate revenue income from dues levied on ships transiting the channel which will add to the national economy.

## **Environmental Management Plan**

### **Construction Phase**

No dredging will be done in Gulf of Mannar except in Adam's Bridge area

Alignment of navigation route at Adam's Bridge in Gulf of Mannar will be minimum 20 km away from marine national park

Land acquired for mobilization and monitoring of activity will be returned to users after completion of dredging activity

A proper rehabilitation plan for the fisherman at Dhanushkody will be drawn during construction phase

Dredged spoil comprising clay and sand upto 2 m of dredging depth will be used for reclaiming degraded land in Pamban island subject to approval of FED for CRZ. Balance dredged spoil will be disposed in sea at a depth 30-40 m, 20-25 km away from islands in National Marine Park in Gulf of Mannar. Dredged spoil generated in Palk Strait / Palk Bay area will be disposed in open sea in Bay of Bengal at 25-40 m depth, 30-60 km away from dredging area

Safe distance (about 4 km) from international medial line will be maintained

During dredging activities, the equipments, vessels, barges required for dredging and transportation of dredged spoil will be maintained in secured area and spillage of oil or any toxic material including paints, anticorrosive agents etc. will not be allowed to spill in sea/coastal waters

Movement of barges for transporting dredged spoil to land area will not interfere with movement of fishing boats in both Gulf of Mannar and Palk Bay region adjoining the Adam's Bridge

It is also recommended that existing jetties at Rameswaram which only cater to fishing activities presently should be augmented to cater to the requirement of handling dredging activities in Adam Bridge and Palk Bay area

Transportation of heavy machinery and construction material in the vicinity of Adam's Bridge will be by sea route using the available navigational depths

During transportation of heavy equipments and machinery by road, care will be taken to avoid traffic hazard, traffic congestion and if required roads will be augmented to meet the conditions of hazard free transportation.

### **Operational Phase**

All the ships originating from Tutitcorin Port will comply to International Maritime Standards and follow MARPOL convention (MARPOL 73/78)

Discharge of bilge, ballast, treated sewage, solid wastes, oily wastes and spillage of cargo will not be allowed in the Gulf of Mannar and Palk Bay area

The traffic of crude oil tankers will be allowed in this route with strict vigilance so as to avoid any possibilities of spillage in this region

It will be ensured that ships navigating in this region should not use such paints and anticorrosive agents on ship bottom which can cause damage to marine organisms

A pilot should be trained or environmental watcher will board the ship to watch marine animals viz. turtle, dolphins, sea cow etc. in the region and navigate the ship safely avoiding any damage to this fauna.

It will be ensured that all the ships berthing at TPT as well as all those using the route without touching TPT will have proper treatment facilities for sewage however discharge of treated sewage will not be permitted in GOM and Palk Bay / Palk strait area

Ships bypassing TPT and transiting the channel will be inspected for its navigational safety measures before it is allowed to enter proposed navigation route

An oil spill contingency plan will be drawn by Tuticorin Port Trust with preparedness to prevent spread of spillage in Gulf of Mannar and Palk Bay area and its immediate recovery by deploying equipments and ships

To benefit large fishing communities in the coastal area of Ramnathpuram and Rameshwaram, a corridor both in terms of space and time be provided to fisherman to use the channel in Adam's Bridge area for moving across Palk Bay to GOM and vice versa for fishing activity

The jetties at Rameswaram are in dilapidated conditions. A programme to construct a few Jetties at Pamban island to augment fishing activity in the region be supported by TPT

The traffic of ships carrying crude oil will be handled with strict vigilance so as to avoid possibility of spillage

The oil spill contingency plan in operation at TPT will be extended to navigation activities in new channel

A pilot will board the vessel either from Rameswaram or appropriate place to navigate ship through GOM area up to Bengal Channel in Palk Bay

The channel will be properly marked by navigational light buoys

Accidents by collision of ships with fishing boats will be totally prevented by slowing down the cruise speed and also alerting the fisherman by cautionary measures. During implementation and operational phases of the project, TPT will take action to avoid the collisions of ships with fishing boats or damage to fishing nets with cooperation from fishing communities, Navy, Coast Guards and other Govt. authorities

Suitable timings apart from ship transit will be given for fishermen to continue with their fishing activities

Maintenance dredging of about 0.55 million m<sup>3</sup> per year is envisaged in the channel based on data available for sediment transport across Palk Bay and Gulf of Mannar

The dredged material will be mostly silt and clay and will not be disposed in sea. Instead it will be used to reclaim degraded areas on Pamban island, Ramnad and Mandapam coastal stretches

To cater to increase in trade envisaged due to this project and to transfer benefit to local fisherman, a minor port facility can be created at Rameswaram in consultation with state authorities