ANALYSIS OF THE ENVIRONMENTAL IMPACT ASSESSMENT

FOR

NAVI MUMBAI INTERNATIONAL AIRPORT

PREPARED FOR

CRP 5440: INTRODUCTION TO ENVIRONMENTAL PLANNING

PREPARED BY

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FALL 2011
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>LIST OF ABBREVIATIONS</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGENCIES INVOLVED IN THE NAVI MUMBAI INTERNATIONAL AIRPORT (NMIA) PROJECT</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHAPTER 1</th>
<th>INTRODUCTION</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Need for new airport for the Mumbai Metropolitan Region</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>1.2 CIDCO and Navi Mumbai International Airport</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>1.3 Environmental Impact Assessment (EIA) for NMIA</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHAPTER 2</th>
<th>ANALYSIS OF ALTERNATIVE SITES</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Comparison of Rewas Mandwa and Navi Mumbai Airport sites</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>2.2 SWOT analysis of the two sites</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>2.3 Site Sensitivity analysis</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>2.4 Expansion of existing airport vis-a-vis Navi Mumbai International Airport</td>
<td>13</td>
<td></td>
</tr>
</tbody>
</table>

| CHAPTER 3 | RESETTLEMENT AND REHABILITATION | 15 |

<table>
<thead>
<tr>
<th>CHAPTER 4</th>
<th>ANALYSIS OF WATER AND WATERSHED ISSUES</th>
<th>18</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1 Impact Analysis in the EIA</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>4.2 Mitigation Measures</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>4.3 Critique</td>
<td>27</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHAPTER 5</th>
<th>PROCESS</th>
<th>28</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1 Clearance from the MoEF</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>5.2 Permission from the villagers (CIDCO Vs Villagers)</td>
<td>32</td>
<td></td>
</tr>
</tbody>
</table>

| CHAPTER 6 | CONCLUSION | 36 |

| REFERENCES | 37 |
## LIST OF ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAI</td>
<td>Airports Authority of India</td>
</tr>
<tr>
<td>CIDCO</td>
<td>City Industrial and Development Corporation</td>
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<td>CSIA</td>
<td>Chhatrapati Shivaji International Airport</td>
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<td>CWPRS</td>
<td>Central Water and Power Research Station</td>
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<tr>
<td>EAC</td>
<td>Expert Advisory Committee</td>
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<td>EIA</td>
<td>Environmental Impact Assessment</td>
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<td>GoM</td>
<td>Government of Maharashtra</td>
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<td>IIT</td>
<td>Indian Institute of Technology</td>
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<tr>
<td>MMR</td>
<td>Mumbai Metropolitan Region</td>
</tr>
<tr>
<td>MoCA</td>
<td>Ministry of Civil Aviation</td>
</tr>
<tr>
<td>MoEF</td>
<td>Ministry of Environment and Forestry</td>
</tr>
<tr>
<td>NMIA</td>
<td>Navi Mumbai International Airport</td>
</tr>
<tr>
<td>SWOT</td>
<td>Strength Weaknesses Opportunities Threat</td>
</tr>
<tr>
<td>TEFR</td>
<td>Techno-Economic Feasibility Report</td>
</tr>
<tr>
<td>TOI</td>
<td>Times of India</td>
</tr>
</tbody>
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AGENCIES INVOLVED IN THE NAVI MUMBAI INTERNATIONAL AIRPORT (NMIA) PROJECT

City and Industrial Development Cooperation (CIDCO)

CIDCO is the lead agency in the Navi Mumbai International Airport (NMIA) project. It was a company incorporated under the Companies Act, 1956 and is wholly owned by the Government of Maharashtra. It has been designated as a New Town Development Authority under the Maharashtra Regional & Town Planning Act, 1966 for development of New Town of Navi Mumbai covering an area of 344 sq.km. Under this mandate, CIDCO was supposed to curb the population influx into Mumbai and divert it toward the new town of Navi Mumbai.

Four decades later, CIDCO’s objectives are still unfinished. Navi Mumbai never heralded the growth it hoped to see. It remains a suburb rather than a satellite town. The township has been constantly fighting complaints of poor infrastructure and substandard services. To be fair, the failure of Navi Mumbai as a satellite town cannot solely be blamed on CIDCO. Developing a new township is more than simply providing infrastructure - economic, social and cultural patterns play a significant role.

Ministry of Environment and Forestry (MoEF)

The Ministry of Environment and Forestry is an arm of the federal government overlooking the implementation of environment policy in the country. During 2009-2010, Mr. Jairam Ramesh held the post of Minister which has a cabinet level rank in the government. Minister Ramesh is known for having removed the shackles of many industrialists as he often raised the green flag in the face of India’s jostle for development. He was the Minister in charge when the NMIA Environmental Impact Assessment (EIA) was given to the MoEF for approval.

Villagers/ Sangharsh Samiti

Currently, there are eight villages on the land proposed for development of the NMIA. These villagers will need to be resettled and compensated for their loss of land and livelihood. To focus
their voices, the villagers formed a committee, namely ‘Sangharsh Samiti’, which directly translates into ‘Struggle Committee’, to voice their opinions and represent the villagers during negotiations.

**Ministry of Civil Aviation (MoCA)**

The Ministry of Civil Aviation is the federal government authority responsible for policy formulation, regulation and development of civil aviation in India. The Ministry oversees the building of aviation infrastructure in the country. The Ministry gave “in-principal” approval to CIDCO to build a greenfield airport in Navi Mumbai in 2006. Being the central authority regulating air travel, the MoCA is concerned about the burgeoning passenger and goods traffic at the current Mumbai airport and is eager to have an international standard, two-runway airport near Mumbai to ease the traffic.

**Indian Institute of Technology (IIT), Mumbai**

A renowned university, the Indian Institute of Technology is India’s premier engineering institute. It attracts the brightest minds and produces cutting edge research in sciences. IIT was tasked with the producing the EIA for the NMIA.

**Central Water and Power Research Station (CWPRS)**

The Central Water and Power Research Station (CWPRS) is India’s principal agency to look into research and development (R&D) issues related to water and energy resources. The agency falls under the Ministry of Water Resources and provides specialized services in mathematical modeling of hydrological projects. CWPRS was tasked by CIDCO to create mathematic models on the hydrology of the region and what the impact of NMIA would look like.
CHAPTER 1  INTRODUCTION

1.1 NEED FOR A NEW AIRPORT FOR THE MUMBAI METROPOLITAN REGION

The Mumbai Metropolitan Region (MMR) is spread over an area of 4355 sq.km. and comprises mainly of Greater Mumbai, Thane, Kalyan, Vasai-Virar and Navi Mumbai. The population of MMR, according to the 2011 census, is over 21 million and is projected to increase to over 30 million beyond the year 2022.

Mumbai Metropolitan Region is experiencing a significant growth in economy. MMR contributes nearly 40% of total Net Domestic Product (NDP) of Maharashtra in terms of income as well as employment (CESE, IIT Mumbai 95). There has been a shift from traditional manufacturing activities to trading and service activities.

![Map of Mumbai Metropolitan Region (MMR)](image)

*Fig 1.1: Map of Mumbai Metropolitan Region (MMR) (Made by Vidhee Garg)*

Since 1998, there has been a significant increase in the number of commercial passengers and air freight in the country. Most of this growth has been witnessed post 2003-04, with the deregulation of the aviation sector. The Chhatrapati Shivaji International Airport (CSIA) at Mumbai handles the highest traffic volumes in the country, approximately 22% of all these operations in 2007-08 (CESE, IIT Mumbai 99). Consequently, the airport is experiencing congestion, particularly
during peak hours. Even with the proposed expansion of the airport, it would only be capable of meeting air traffic demand up to 2013-14.

1.2 CIDCO AND NAVI MUMBAI INTERNATIONAL AIRPORT

Realizing the need for a second airport for Mumbai, the Ministry of Civil Aviation granted in-principle approval in July 2007 for the development of second airport at Navi Mumbai, on public-private partnership (PPP) basis (CESE, IIT Mumbai 97). The Government of Maharashtra (GoM) also granted approval in 2008 and appointed City & Industrial Development Corporation of Maharashtra Limited (CIDCO) as a nodal agency for implementation.

Navi Mumbai is Asia’s largest planned and developed city for a population of 2 million and 0.8 million jobs. It is currently underperforming and CIDCO sees the new airport as an opportunity to boost growth in Navi Mumbai.

CIDCO is the project proponent (lead agency) and is in the process of planning, design, project formulation and obtaining necessary clearance to invite public bids for selection of a strategic partner for the development of Navi Mumbai International Airport (NMIA). A Special Purpose Company (SPC) will be finally incorporated by CIDCO, Airports Authority of India (AAI) and the strategic partner, who in-turn will take up implementation of NMIA.

1.3 ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR NMIA

An airport project is treated as a Category “A” project (CESE, IIT Mumbai 126) which requires environmental clearance from the Ministry of Environment and Forests (MoEF). An Environmental Impact Assessment (EIA) study is a primary requirement for this clearance and has been prepared by The Centre for Environmental Science and Engineering at the Indian Institute of Technology (IIT), Mumbai.
The EIA study was carried out to ensure that the project is environmentally sustainable and has recommendations for preventing, minimizing, mitigating and compensating for adverse impacts on the environment and affected population. This will ultimately assist in the decision making process to achieve a sustainable development.

![Fig 1.2: Study Area for Environmental Impact Assessment of Navi Mumbai Airport](image)

The study area for the EIA covers an area within a 10 kilometer radius around the airport site. Within this area, the scoped environmental parameters will be studied to assess the magnitude of impact:

- Atmosphere
- Land
- Ground Water
- Habitat and Communities
- Aesthetic and cultural factors
- Geology
- Coastal Zone regulations
- Noise and Vibration
- Surface Water
- Species and Population
- Socio-economic factors
- Health and Safety
- Hydrology
- Land use
1.4 SUMMARY OF THIS STUDY

In this paper, we aspire to raise questions about the attitude of the planning agencies towards the EIA as well as the entire project. We have conducted a comprehensive review of the project, assessing four distinct facets where CIDCO has been active. The topics in focus are: (1) Choice of alternate sites; (2) Resettlement and rehabilitation of project affected people; (3) Impact on the watershed; (4) Process of project clearance.

In all four cases, we find that the lead agency, CIDCO, has fallen short of expectations. The EIA is surprisingly vague on many critical accounts leaving the reader questioning the conclusions and proposed mitigation measures. To better assess the process of the EIA and the project, we conducted a detailed investigation into relevant news report and other sources, which provided us further insight into the project.

Overall, we believe that CIDCO has been reluctant to engage in discussions with various concerned stakeholders and has even been dismissive about certain vital issues.
CHAPTER 2  ANALYSIS OF ALTERNATIVE SITES

The present airport at Santacruz, Mumbai is not large enough to serve the increasing demands of trading and servicing activities – domestic and international - in the commercial capital of the country. Given the location of the present airport and the capital investment required to expand it, it is not feasible to develop a larger airport at the same site. The question, then, is what would be an appropriate site for the project.

The parameters for selecting possible sites for airport development and operation are as follows:

- The site should have an obstruction free approach
- The site should have technical and operational suitability
- Site development should create minimum disturbance to population
- Availability of land for a large airport
- Ground access time of 1 hour 30 minutes (as per international standards)
- Availability of physical and social infrastructure

Based on the above mentioned parameters, the following sites were considered and analyzed:

1. Mahapan in Sindhudurg District
2. Rewas-Mandwa in Raigad District
3. Navi Mumbai

The first site, Mahapan in Sindhudurg district, is located approximately 350 km from Mumbai which translates into a road travel time of about 8-10 hours. Needless to say, this is not a viable option especially since the new airport is being developed to cater to the international (passenger and cargo) air traffic needs in a fast globalizing city like Mumbai. Moreover, Sindhudurg district is a
largely rural area – only 9.5% urban population. Why would this even be considered as a possible site for the airport?

The analysis of the alternative sites is carried out based on strength, weaknesses, opportunity and threat (SWOT) analysis and site sensitivity analysis.

2.1 COMPARISON OF REWAS MANDWA AND NAVI MUMBAI AIRPORT SITES

*Project accessibility:* The primary weakness of the Rewas Mandwa site is that the only road connection from Mumbai follows a long and circuitous route translating into a journey time of 3 hours. The international standard for road travel time to an airport is 1.5 hours which, as per the EIA, the Navi Mumbai site satisfies.

However, both these journey time estimates consider optimum/ least traffic conditions. Traffic on the road between Mumbai and Navi Mumbai is slowed down by several bottle necks, especially during peak traffic hours, increasing travel times to as much as 3 hours.
Moreover, connectivity to Navi Mumbai from the northern and southern tips of the island city is limited. Given the increasing road traffic in Mumbai, travel time of 1.5 hours to Navi Mumbai could only be achieved with the development of superior road infrastructure. Presently, the planning authority has not proposed development of any new transport infrastructure between Mumbai and the proposed airport site at Navi Mumbai.

**Land acquisition:** At the Rewas Mandwa site, CIDCO will have to start the land acquisition process from scratch whereas in Navi Mumbai, 78% of the proposed site is already in possession of the corporation. The region around Rewas Mandwa is dotted with weekend homes owned by the rich and famous in Mumbai. It follows that with increasing popularity, real estate prices have gone up tremendously leading to the formation of a land mafia in the region.

Acquiring land here does not just require enormous capital expenditure but is also a politically sensitive debate (since the wealthy Mumbaikars fill the coffers of the city’s politicians). On the other hand, most of the land owned by CIDCO in Navi Mumbai is wetland area – developing the land to make it buildable will require very high capital expenditure, in addition to the detrimental environmental effects.

**Rehabilitation:** When the project proposal was put forth, calculations showed that it would cost the government substantially lesser money to rehabilitate the village settlements in Navi Mumbai than the ones in Rewas Mandwa. However, with the project receiving political mileage and media attention, the villagers in Navi Mumbai are now demanding five times the market value of their properties. This demand is threatening to make the project financially unviable and the government is currently in negotiations with the property owners.

**Environment sensitive factors:** The coastal strip along Rewas Mandwa is dotted with distinct geographic and biological features such as estuaries, creeks, bays and over 350 species of flora and
fauna. Agricultural biodiversity in the area is an outcome of man’s effort to develop agro forestry modes while maintaining existing biodiversity.

While the EIA details the biodiversity in Rewas Mandwa, it skims over the environmental conditions at the Navi Mumbai site. Environmental groups have objected to this coverage (or lack thereof) in the EIA and recent reports detail the biodiversity in the region and the harmful effects of destroying it to build a new airport. This dispute over environmentally sensitive factors is currently the most contentious topic about the proposed airport and we have taken a closer look at it, further on in the report. The specific analysis of the watershed and biodiversity will be detailed in Chapter 4.

2.2 SWOT ANALYSIS OF THE TWO SITES

The SWOT analysis is a qualitative analysis which compares various technical and financial features of the two sites. The analysis reveals that the Navi Mumbai site is preferred in terms of higher strength, less weaknesses, no threat and viability point of view when compared to Rewas Mandwa.

2.3 SITE SENSITIVITY ANALYSIS

The site sensitivity analysis (CESE, IIT Mumbai 157) measures the site sensitiveness of both the sites considering various environmental parameters. The site scoring minimum marks is considered as the best environmentally selected site. The Rewas Mandwa score is 775 and the Navi Mumbai score is 500 making the latter more environmentally suitable owing to its moderate impact on the environment.

2.4 EXPANSION OF EXISTING AIRPORT VIS-A-VIS NAVI MUMBAI INTERNATIONAL AIRPORT

Mumbai’s economy is indeed growing rapidly and with increasing trade, it needs to a new airport to accommodate domestic and international air traffic/ travel. Efforts to expand the area of
the existing airport in Santacruz have reached a road-block particularly because of the issues involved with rehabilitating thousands of slum dwellers in settlements around the airport periphery. However, the EIA makes no mention of the costs involved with expanding this airport vis-a-vis developing a new airport at Navi Mumbai.
CHAPTER 3  RESETTLEMENT AND REHABILITATION

Ten settlements of seven villages fall within the airport zone and are required to be rehabilitated and resettled in the three earmarked re-settlement sites at Vadghar, Dapoli and Vahal villages. Approximately 15,000 people will need to be relocated. Lack of explanation in the report begs the question, ‘On what basis were these sites selected?’

Fig 3.1: Map showing designated sites for rehabilitation of project affected persons (EIA image, edited by Vidhee Garg)

As per the ranking given in the EIA, rehabilitation and resettlement is a big component and will have a substantial impact. For a substantial impact feature, the accompanying data and mitigation measures mentioned in the EIA are vague and leave many questions answered.
In addition to the settlements that fall within the airport zone, there is a need to house numerous other temporary and permanent workers associated with the airport and its ancillary activities. During the construction phase, there will be an influx of a large number of skilled and unskilled workers migrating to the area who will need to be provided accommodation close to the site. Some of this housing will be temporary and the authorities will have to ensure adequate clearance of these units and subsequent site clean-up.

Part of the airport zone has been demarcated for housing for airport staff – as part of the ancillary programmatic uses. However, the EIA makes a rudimentary estimate of the number of staff members and total area required for housing them on site.

Quoting from the EIA:

“The airport is likely to generate about 90,000 direct and indirect jobs which translate into a population of about 3.5 lakhs (average family size of 3.8 & Man power ratio of 1.33/family). With an assumption that about 80% of this man power would be residing in Navi Mumbai and 20% will commute from outside, about 65 thousand dwelling units would be required (keeping the service population also in mind). The total land requirement of these dwelling units would be about 300 ha net residential area (assumption of average dwelling unit area 50 m²)” (CESE, IIT Mumbai 700)

An indication of the categories of staff and number of staff members in each category will help determine the different housing typologies required on site. Moreover, assessing the area required for related amenities will give a more realistic estimate of the total area required for housing.

Along with providing housing, for project affected persons and airport staff members, the authorities will need to support it with appropriate amenities. The EIA mentions the need to develop basic infrastructure such as water supply, electricity, sewerage, roads and social infrastructure. At
the same time, it is unclear from the report the steps that CIDCO will take to mitigate social and cultural losses and also to ease tensions among the community regarding economic opportunity.

As per the salient features of the resettlement and rehabilitation (R&R) scheme proposed by CIDCO, project affected persons (PAPs) are entitled to free vocational training and preferential placement in jobs related to construction and operation of the airport. According to a news report on November 1, 2011, negotiations for land acquisition have been halted because CIDCO did not hire seven competent PAPs as engineers for a total workforce of fifty hired engineers (at this stage of work). The villagers are seeing this as a case of discrimination and demand that justice be done.

This incident has added to the existing complaints of the project affected people. Some of the PAPs have been living in their current settlements following a displacement for another CIDCO project. Despite being promised extensive compensation, the people have only received the monetary return and are still awaiting recompense in the form of land that was promised to them.
The closest bodies of water to the proposed Navi Mumbai airport site are Panvel Creek, Gadhi River (and drainage basin), the Taloja River and the Ulwe River which runs along and through the boundary of the airport. In order to effectively build the airport on the site, significant changes need to be made to the existing water environment. It was determined that the training of Gadhi river and diversion of Ulwe river was the best course of action in the development of the airport as it was the most cost effective, least environmentally damaging, and hydraulically efficient. This option was also seen as being easy for construction and maintenance for the duration of operating the airport.

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1 The Hydrogeological Study in the Impact Zone for Navi Mumbai International Airport groundwater study was carried out by Groundwater Survey and Development Agency, (GSDA) Water Supply & Sanitation Department, Govt. of Maharashtra.
4.1 IMPACT ANALYSIS IN THE EIA

In the introduction, the EIA seems to have already agreed with the option for citing the airport in Navi Mumbai, so it is not too surprising that the environmental focus of the EIA is more concerned with determining whether the location itself is safe for human habitation and development rather than whether human development is safe for the location. An impact analysis has been conducted on the effect of the proposed airport on the environment by the Central Water Power & Research Station (CWPRS). However, the mitigation proposed as a result of the impact analysis does not reflect the level of necessity suggested in the EIA and the mitigations involved are extremely vague.

In terms of water quality, the NMIA EIA focuses greatly on pre-existing quality of the water, finding that “the overall quality of marine water in the project area was found to be good based on NSF Water Quality Index” after erecting thirteen monitoring and ten ground water monitoring stations which tested for the physical, chemical and biological properties of the groundwater (CESE, IIT Mumbai 72-74). These were tested pre, post, and during monsoon. However, very little attention is paid to the quality of the water post-construction. The greatest concern for the quality of water relates directly to the lack of water for human consumption.

The evaluation conducted to determine the overall impact of the project on the environment was broken down into nine categories of influences: direct, indirect, synergistic, local, strategic, short-term, long-term, reversible, and irreversible. Each item was given a weight from 0-8; 8 as having the most impact. The nine items were then added up and multiplied by 8 to determine the overall impact of each action. In regards to water, the EIA found that the diversion of the Ulwe River and training of the Gadhi River will have “massive” consequences on the marine eco-system and that the development of the airport will create a “massive” risk for flooding and water scarcity.

---

2 Table 4.23 and 4.24, Chapter 4
The results of the study show that the diversion of the Ulwe River would have a medium impact on the water quality reaching the Panvel Creek and that this was very likely to occur (CESE, IIT Mumbai 712). There is no further mention of the airport’s effect on water quality in the evaluation section and the EIA contradicts itself in further analysis by stating that flooding would not be an important issue. Also, the training of the Gadhi River and the diversion of the Ulwe River was determined to have a great cumulative impact in terms of interference with the natural drainage eco system (CESE, IIT Mumbai 712). Flooding in lower lying areas is shown to have a high/medium impact in synergy and medium long-term, strategic, and irreversible impacts resulting in a high cumulative impact score of 108 (CESE, IIT Mumbai 713). This large value for impact repeats itself throughout the impact analysis in impacts dealing with water.

The EIA confirmed that the development of the airport would have significant effects on water leading it to be sparser and having long term and irreversible effects on the eco system. Specifically, the EIA determined that development would have a significant effect on the connectivity of waterways, availability of water, natural drainage systems and flooding. The waterways connectivity was determined to be affected by medium direct, long-term, and irreversible affects (CESE, IIT Mumbai 713). The water requirement for domestic purposes was determined to have a serious synergistic impact and medium long term and irreversible impacts when taking into account employment, migration and settlement (CESE, IIT Mumbai 716).

For further clarity these assessments were then classified by professionals into four categories of significance (delineated by color in the tables below): massive (red), substantial (orange), significant (yellow), and tangible (light yellow).

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3 Chapter 5, Table 5.7
4 Table shown in more detail in Chapter 5, Table 5.7
Table 4.1: NMIA Construction Phase Impact Matrix of EIA: NMIA Design Phase (Table 5.19 in the EIA)
<table>
<thead>
<tr>
<th>Stage of Project</th>
<th>Possible Effects on the Environment</th>
<th>Environment Component</th>
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<tbody>
<tr>
<td>Construction Phase</td>
<td>Extremely high dust levels</td>
<td>Air</td>
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<td></td>
<td>Air Pollution due to equipment fuel usage</td>
<td>Air</td>
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<tr>
<td></td>
<td>Air Pollution due to levelling activity</td>
<td>Air</td>
</tr>
<tr>
<td></td>
<td>Air Pollution due to construction activity</td>
<td>Air</td>
</tr>
<tr>
<td></td>
<td>Increase ecological footprint</td>
<td>Ecosystems</td>
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<tr>
<td></td>
<td>Sediment runoff into the creek</td>
<td>Ecosystems</td>
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<td></td>
<td>Safety of workers</td>
<td>Health &amp; Safety</td>
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<tr>
<td></td>
<td>Accident during the construction stage</td>
<td>Health &amp; Safety</td>
</tr>
<tr>
<td></td>
<td>Fire hazard during the construction stage</td>
<td>Health &amp; Safety</td>
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<tr>
<td></td>
<td>Noise Pollution</td>
<td>Noise</td>
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<td></td>
<td>Increase in the water requirement for domestic purpose leading to stress on water availability</td>
<td>Water &amp; Wastewater</td>
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<tr>
<td></td>
<td>Lack of Sewerage and Sewage Treatment Facilities leading to water pollution</td>
<td>Water &amp; Wastewater</td>
</tr>
<tr>
<td></td>
<td>Loss of water bodies (open wells and ponds) in the project site</td>
<td>Water &amp; Wastewater</td>
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<td></td>
<td>Indoor air pollution in the camp due to biomass fuel for cooking</td>
<td>Air</td>
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<tr>
<td></td>
<td>Air Pollution due to construction vehicle fuel usage</td>
<td>Air</td>
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<tr>
<td></td>
<td>Misuse of local ecological resources like forests for firewood</td>
<td>Biodiversity &amp; Forests</td>
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<td></td>
<td>Loss of Biodiversity</td>
<td>Biodiversity &amp; Forests</td>
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<tr>
<td></td>
<td>Water logging and cross drainage issue during construction</td>
<td>Land</td>
</tr>
<tr>
<td></td>
<td>Vibration in adjacent areas</td>
<td>Noise</td>
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<td></td>
<td>Solid waste generation and inadequate disposal</td>
<td>Waste</td>
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<td></td>
<td>Disposal of excavated material</td>
<td>Waste</td>
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<td></td>
<td>Pollution of land, ground water and surface water arising from wastes and spillages due to construction</td>
<td>Waste</td>
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<td></td>
<td>Disposal of construction waste / debris</td>
<td>Waste</td>
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<td></td>
<td>Increase in power consumption</td>
<td>Energy</td>
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<td></td>
<td>Air pollution due to DG sets</td>
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<tr>
<td></td>
<td>Increased requirement for health and educational facilities</td>
<td>Health &amp; Safety</td>
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</table>

*Table 4.2: NMIA Construction Phase Impact Matrix of EIA: Construction Phase (Table 5.20 in EIA)*
It was determined in the impact matrix that the increase in the water requirement for domestic purposes would lead to stress on water availability which would lead to massive consequences (CESE, IIT Mumbai 718). In the operation stage, sewage treatment issues were designated as having a substantial impact on the environment. In addition, availability of water issues for airport zone and the increase in the water requirement for domestic purpose leading to stress on water availability in the region all are listed as having significant impacts (CESE, IIT Mumbai 721). Flooding in low lying lands, sediment runoff into Panvel Creek, and loss of marsh land are analyzed to be massively impacted by the airport (CESE, IIT Mumbai 719). The construction phase impact matrix indicated that there would be a massive impact on the water requirement for domestic purpose which would lead to stress on water availability, the lack of sewage and sewage treatment facilities. This, in turn, will have a massive impact on water pollution, and there is projected to be a massive loss of water bodies (open wells and ponds) in the project site (CESE, IIT Mumbai 720).

It is interesting to note that flooding is not adequately tackled in this EIA. In the impact matrix, flooding is considered to be an issue having massive impacts but in the mathematical and physical model, it is claimed that studies carried out by CWPRS have shown that reclaiming land on the left bank of the Panvel Creek on top of what was the Ulwe river will have no significant effects on the water level. The EIA then states:

“The change of river flow is inevitable and during the development, due care will be taken so to maintain the required hydraulic flow to avoid water logging in the upstream and also any water logging in the project area either during construction or operation phases” (CESE, IIT Mumbai 757).6

This statement both contradicts the Impact Matrix and gives very vague information on the mitigation. It is not clear in this context whether the change in river flow being inevitable is a function of the Ulwe being diverted or if the statement points to a greater change in flow of the diverted river due to additional natural phenomena. It is equally unclear what “due care” will be

5 Table shown in more detail in Chapter 5,Table 5.8- 5.11
6 Table 6.1: Environmental Management Plan
undertaken to maintain constant flow of the river and therefore prevent the water from becoming stagnant and flooding an upstream area. Such “due care” is an example of an important mitigation measure which requires elaboration.

The EIA further contradicts itself in the Impact Assessment section following a discussion of a flood predicting model for Panvel Creek.

“The report states that there is negligible change in the water levels in Panvel Creek with the airport reclamation. While this may not appear on comparative hydrographs and longitudinal sections of maximum water levels with and without the airport, this will be illustrated with a table comparing the maximum water levels at key locations with the left and right bank levels in the full report” (CESE, IIT Mumbai 1316).

Here, the EIA reiterates the claim that the construction on reclaimed land where the Ulwe River used to exist will have negligible effects on the rise of water level but cedes the fact that this claim is not supported by analytical data. It also obviously contradicts the earlier impact matrix in which flooding is shown as being a massive impact. The EIA then alludes to another document in which a table would be created that, through comparison, would prove the claim. It is unclear how grave the flooding could potentially be in the lower lands do to these contradictions in the text.

4.2 MITIGATION MEASURES

In order to reduce some possibility of runoff from the diverted Ulwe River, the EIA suggests construction of a “few Water Conservation Structures” in areas from the village of Garade to the village Bhangarpada. The EIA does not proceed to define what a conservation structure is (though the EIA treats these structures as proper nouns) nor does it elaborate on how many a “few” is meant to be (CESE, IIT Mumbai 881). 7

Mitigation measures are proposed for the marine ecosystem and to increase potable water. To decrease the pressure on the surrounding marine ecosystem, the project proposes to dredge/channelize the river during high tide. In addition, the new course of the river flow is

7 Chapter 8, 8.4 Groundwater Study
proposed to have similar physiographic characteristics as the alignment pre-training. This is believed to mitigate the negative impacts of siltation on the aquatic ecosystem (CESE, IIT Mumbai 701). The EIA claims that the ensuing turbidity in water course diversion is temporary and any negative effects on the local eco system would disappear over time. However, the EIA does not operationally define what “temporary” actually means. It only states: “The impacts due to channelization are limited to construction phase only and the ecosystem will recover the loss over a period of time” (CESE, IIT Mumbai 701). In removing all marine plant life the project effectively destroys all the natural habitats of the local marine life. The entire process will involve the removal of habitat, the physical removal of marine fauna, along with the introduction of “temporary” turbidity in the water which significantly reduces the penetration of sunlight into the water which would kill any surviving fauna. This seems less like a temporary condition as much as a calculated extermination initiative. What more, there is no proposed initiative to repopulate the diverted river with its natural flora and fauna (CESE, IIT Mumbai 735).³⁸

To meet the significant increase in demand for potable water, the EIA says that CIDCO (City & Industrial Development Corporation) is in the process of developing a water source at Balgana Dam. This water is proposed to serve the airport’s new flow of passengers, visitors, staff, and the siting of commercial facilities, air and land side facilities, residential, conference facilities, as well as the need for AC Plant, irrigation for planted area, fire-fighting. To fulfill these purposes the dam will have an installed capacity of 350 MLD⁹ with an additionally sanctioned capacity of 250 MLD. In addition, the EIA proposes to use water sources from the Morbe Dam which currently supplies 350 MLD but could potentially supply 450 MLD (CESE, IIT Mumbai 735).

It is very clear from these mitigation measures that the proposed dams are an integral part of the success of the airport which begs the question as to why the environmental impact of the proposed Balgana Dam is not at all taken into account in the EIA. In addition, the Morbe Dam is

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³⁸ Chapter 5, Table 5.14
⁹ MLD= Million Liters Daily
being developed by the NMMC (Navi Mumbai Municipal Corporation) and is therefore an integral part of the development of the airport. This is entirely ignored by the EIA as if the dams supplying the airport with water are independent projects not relating to the airport. The EIA makes no mention of where the water is being diverted from. This begs the question of who is losing access to this large supply of water as a result of the dams.

It is also interesting to note that the conclusions and recommendations section has no suggestions for mitigations concerning the diversion of the Ulwe River, which is the most environmentally impactful undertaking in construction. Instead conclusions and recommendations are made regarding dugwells, water quality and durations of time when the wells go dry (CESE, IIT Mumbai 1098). This again points at the fact that the EIA is more concerned with finding potable drinking water for human consumption post construction rather than an interest in mitigating the effects of construction on the land. The last recommendation involves creating conservation structures for the sake of preventing runoff onto the airport. This too indicates that the EIA is more focused on how to control the environment to protect the construction rather than protecting the environment during construction.

In the conclusions, the recommendation for Gadhi River does not give any specific mitigation measures but instead points out the status quo: that there is a rising water table and that some aquifers are still yielding “sweet” water. The recommendation again suggests de-silting the trained Gadhi River but gives no indication as to how this could be done and suggests that the conservation structures be put in after an additional survey. Its final recommendation is to use the trained Gadhi River as a rowing canal as it will be wide enough to serve this purpose. This suggestion has no implications in mitigation whatsoever and is, arguably, extremely tangential to the purpose of the EIA (CESE, IIT Mumbai 1100).

The only place where anything that resembles a mitigation plan can be found is in the environmental component of ‘Waste and Water’ and involves sustainable consumption of water
post construction of the airport. Here, the EIA proposes a number of mitigations to reduce water usage during the operational phase of the airport. The EIA suggests using low flow fixtures and appliances; harvesting storm water which includes the citation of storm water treatment facility and storm water capture structure; reuse of sewage for greenbelt development, air conditioning and floor washing; as well as on-site installation of sewage treatment plants for the reuse and recycling of wastewater. Clearly, maintaining a clean supply of water is the top priority for this EIA (CESE, IIT Mumbai 736).

The budget for the proposed mitigations and surveillance is as unclear as the mitigations proposed. Though the EIA states that monitoring of the water would be done throughout construction and operational phase, the budget for the post-construction phase of the Navi Mumbai International Airport allocates 1.5 lakhs towards water quality and control and a whopping 9 lakhs towards miscellaneous expenses, which is more than it gives to any operational monitoring measure (CESE, IIT Mumbai 782). There is no indication given as to what those miscellaneous expenses would cover.

4.3 CRITIQUE

The EIA has gone to many lengths to determine the safety of the water in the two rivers and its impact analysis clearly states how the water availability and marine ecosystems will be affected. The EIA does not go into detail about the airport’s proposed effects on the quality of the water. The mitigations that are proposed for flooding contradict the impact analysis and therefore do not take flooding mitigation measures seriously. In addition, no solutions are proposed for mitigating the loss of marine ecosystems and those provided are extremely vague. That the only detailed solutions offered involves sustainable human use of water once the airport is in operation is a clear indicator that the main purpose of the EIA was to determine whether the site was a good fit for the airport rather than what effects the airport will have on the land.

10 Table 6.4
CHAPTER 5  PROCESS

The Navi Mumbai airport has been shrouded in unclear and seemingly unfair processes from the very beginning. The economic and political weight of the NMIA project has affected the entire course of planning and discussion. Two important issues have shadowed the process right from its inception –

- **An airport in Mumbai serves the whole country:** Mumbai is India’s most economically prosperous city. No other city in India has had a hand in India’s recent growth spurt as has Mumbai. An airport servicing Mumbai is important not just for Mumbai but for the future of the entire country. This added weight has created an imbalanced atmosphere during the negotiation. Not accepting the new airport in Mumbai is sometimes seen as anti-Indian or anti-development.

- **Navi Mumbai could be the only solution to Mumbai’s population:** As a possible satellite city, Navi Mumbai could be an answer to Mumbai’s burgeoning growth. This has underplayed through the discussions and the lobbying. As the Indian economy sprints on, Mumbai continues to draw businesses and populations but has already far exceeded its capacity. Navi Mumbai’s proximity to Mumbai and already existing infrastructure could help not just catch the overflow from Mumbai but exist as a growing town parallel to Mumbai.

There is no doubt that Mumbai needs an airport immediately. The urgency to start construction and have certain services of the airport available within the next few years is paramount. The longer the negotiations are stalled, the more critical the need for a decision becomes.

In this chapter, we identify two nodes of conflict which have occurred over the last decade. These are the two main clearance hurdles which CIDCO has had to clear, or is still in the process of clearing.

1. Clearance from the MoEF

2. Permission from the villagers who will be dislocated
Through the following discussion, we highlight certain exogenous forces in action which were motivated by issues beyond the scope of the EIA or within conventional discussion. This paper does not cast judgment on the issues but does cast judgment on the disrespect the stakeholders have had for the process.

5.1 CLEARANCE FROM THE MOEF

The conflict between the lead agency CIDCO, supported by the Ministry of Civil Aviation (MoCA), and the approval entity - Ministry of Environment and Forestry (MoEF) - has been the center point of the process.

5.1.1 No clear reasoning for site selection suggests political maneuvering

The idea for a new airport in/near Mumbai was first conceived in 1997. At that time, Rewas-Mandwa was the site under consideration and the proposed date for starting airport operations was 2016-17.

However, by 2000, this site was deemed unfit and there were intense discussions over the Navi Mumbai site. The State Government of Maharashtra proposed this alternative on the grounds of existing infrastructure at the Navi Mumbai site and that it falls under the jurisdiction of the Mumbai Metropolitan Region. Based on this suggestion, the MoCA advised the Maharashtra Government to begin detailed studies on the location.

The switch of sites was no documented anywhere and nor was any press release issued. No comparative study of the two sites was authorized by CIDCO. The decision appears to be hasty and within a year a Techno-Economic Feasibility Report (TEFR) was presented by the Chief Minister of Maharashtra to the MoCA in 2001. At the time, the project allocated 350 hectares of land in Navi Mumbai.
Questions regarding the selection of the site were later raised by the MoEF when the EIA was submitted. During the negotiations, the process of site selection was discussed at length. Remarks by the then Minister of MoEF lead us to believe that the decision was never up for discussion but rather there were exogenous forces involved.

Without any substantial comparative study, the MoCA was unwaveringly supporting the Navi Mumbai plan. The state government too shared and supported MoCA’s view without any concrete evidence. An August 2010 statement from the Chief Minister of Maharashtra repeated:

“Mr. Patel told reporters that there was no question of considering alternative sites at Kalyan or Rewas Mandwa.” (Special Correspondent, 2010)

In October 2010, prior to giving the clearances, Environment Minister Jairam Ramesh quotes:

“The location is a fait accompli. There is no way we can change it now. We are only trying to ensure that the environmental impact at the current site is minimized.” (Indian Express Correspondent, 2010)

Given that, in 2010, no construction had begun and neither had any other form of commitment been given, this statement indicates an external (maybe political) force behind the selection of the Navi Mumbai site. The only advantage for the site was that it faced the least conflict in term of land acquisition since CIDCO owns 78% of the land (although this proved to be major hurdle later).

As described in Chapter 1, the reasons given for choosing the Navi Mumbai site over others are weak and lead us to believe that some other forces were in action.

5.1.2 CIDCO non-responsive to ecological concerns

After the submission of the draft EIA, the MoEF flagged several issues and questions about the proposed project. Chief among these were:

1) The breaking down of a 91 meter high hillock

2) Diversion of two rivers – Gadhi and Ulwe (refer to Chapter 4)
3) Destruction of 400 acres of mangrove forest.

After the submission of the draft EIA, the negotiations between the two sides flared into a national debate of ‘the environment versus development’. The media was actively following the proceedings, even exacerbating the already polemic project.

Finally, the Prime Minster intervened and formed an Expert Advisory Committee (EAC) to look specifically into the draft EIA and find a compromise between the MoEF and combined forces of the MoCA and CIDCO. The EAC was founded under the auspices of the MoEF and was given the authority for approving the project.

The Economic Times reports a source close to Environment Minister saying:

"It seems that they (CIDCO) have made no attempts to accommodate the ecological concerns of the ministry." (Goswami, 2010)

While the EIA is now available for public viewing, during the period of negotiations in 2010, the draft EIA was not released to the public (Jamwal, 2010). CIDCO did release certain maps and documents but the bulk of the EIA was not available to the public: another testament to the lack of transparency by CIDCO.

After murky negotiations, and visits to the site, the project was finally given approval in November 2010. At this time, Minister Jairam Ramesh stated:

“From an environmental point of view, this has been a very major compromise that has been reached.” (Centre for Aviation, 2010)

Although there is no direct evidence to suggest this, but implicit statements and the tone of press releases indicate that the MoEF received the raw bargain in the negotiations. This probably happened due to the importance of the project, the increased urgency to begin construction and lobbying power of Mumbai’s local authorities.
5.1.3 Usage of outdated maps

The maps submitted by CIDCO in the draft EIA were found to be outdated and poorly scaled. This objection was raised in the July 2010 meeting between the EAC and CIDCO. The maps dated back to 1995 and used a scale of 1:25,000.

The Ministry asked Anna University to prepare new maps. Five officials were appointed and new maps were prepared at a scale of 1:4,000 (Indian Express Correspondent, 2010). These new maps redefined the high tide line of the two rivers flowing through the site. This change brought another 100 acres of land under the CRZ coverage. The total sensitive area of the project increased from 28% of the project area to 37% (TOI Political Bureau, 2010).

The use of outdated maps is another example of CIDCO’s insolence toward a fair environmental assessment process.

5.2 PERMISSION FROM THE VILLAGERS (CIDCO VS VILLAGERS)

Approximately 15,000 villagers will need to be rehabilitated from 7 villages in the NMIA region. At the point of writing this paper, this is the only step blocking the construction of NMIA.

The distrust of CIDCO among the villagers is deep rooted and has historical precedence. Villagers believe that CIDCO has previously imposed unfair deals on ignorant villagers. When Navi Mumbai was first developed as a township to support Mumbai, many acres of land were acquired. Anecdotal evidence indicates that most displaced villagers are still awaiting their compensations from the 1976 land acquisitions (A-Staff Reporter, 2010).

In addition, CIDCO has not been transparent in its communication with the villagers. Newspapers reports claim that the villagers were not contacted regarding land acquiring or compensation, even up to 2006, when the decks at the MoCA has already been cleared and in principal approval was already attained (NMTV Staff Reporter, 2010).
As per requirements, CIDCO held a public hearing on 5th May 2010. Given the circumstances, the report on the public hearing in the EIA submits an unusually positive report.

“The examination of the proceedings of public consultation reveals that no points/study/demands were raised by the attendees during the public hearing. The questions raised by the attendees were mainly seeking the information regarding the project details and clarifications on the studies covered in draft EIA study. No specific environmental concerning points were raised during the public consultation meeting requiring attention in preparation of final EIA Study” (CESE, IIT Mumbai, 2010b).

This hunky dory public hearing report is explained by the fact that all 18 villages boycotted the hearing and stood outside the venue with placards, shouting slogans. The villagers believed that the public hearing was only a spectacle by CIDCO and it was unwilling to listen to their demands.

Three elements of this process are relevant:

**5.2.1. Compensation for the land**

The villagers, consistent through the preceding years, have been demanding their fair compensation and rehabilitation for their losses. However in 2011, after the EIA was cleared by the MoEF, this conflict has escalated into near impasse. In a sudden change of events, the villagers have started demanding Rs 20 crore per acre (USD 3.8 million per acre), a price five times higher than market rates.

This swing in demand was supported by the new 2011 land acquisition bill still awaiting Parliament approval - Land Acquisition, Rehabilitation and Resettlement Bill, 2011. The new bill states that all land for any project must be acquired at market rates and the land owners have the legal right to demand the right compensation. With this bill as an argument, the villagers are demanding higher compensation.

**5.2.2. Rehabilitation**

Current Maharashtra legislation demands that project affected persons (PAPs) be rehabilitated in 12.5% of the developed land. However, many villagers have yet to receive the 12.5% land promised during the 1976 land acquisition.
The villagers formed a committee namely ‘Sangharsh Samiti’, which directly translates into ‘Struggle Committee’, to voice their opinions and represent the villagers during negotiations. In a letter dated April 18, the committee wrote to CIDCO that despite repeated complaints/agitations, the concerns of the PAP have yet to be resolved. The villagers felt that CIDCO was not being forthright with them. In another letter addressed to Chief Minister Chavan, the committee stated -

“We are upset with CIDCO and if our long-pending demands are kept hanging, we will oppose the project. Therefore, you should look into the demands made by the committee” (Kher, 2011).

5.2.3. Provision of work to project affected people

As the local environment is linked to the livelihoods in the villages, the villagers also deserve equivalent support to match this loss. This is usually achieved by training and including local workers in the workforce of the proposed project. Often, the displaced people are also given financial assistance or vocational training.

CIDCO has been sluggish in keeping the villagers informed about proposed rehabilitation measures. Some villagers claim that CIDCO has not been clear about the rehabilitation package (Shaikh, 2010). Some of the interactions of the villagers with CIDCO have also left a bad taste –

- In anticipation of the project, CIDCO built a vocational school for the villagers. However, the school was located 20 km away and travelling such distances are both time consuming and costly. Most villagers could not participate in these schools and eventually CIDCO had to close down the school.

- CIDCO promised to include PAP in both skilled and unskilled positions. However, of the list of candidates selected to fill 50 engineering positions, only seven were from the PAP category. Eventually, all PAP candidates were rejected after interviews.

While in both cases, CIDO was legally fulfilling its promise; its attitude toward the process has left the villagers feeling suspicious of this project.
“For more than 40 years, PAPs have been demanding their rights, but CIDCO yet again tricked them. When we came to know of the non-enrollment of PAP youths in CIDCO, we called for immediate halt of the survey that was being carried out in 10 villages across Panvel and nearby areas,” revealed a senior member of the Samiti” (A-Staff Reporter, 2011).

Overall CIDCO’s handling of the entire process has been unbefitting of a state agency.
CHAPTER 6  CONCLUSION

In conclusion, the EIA of the proposed Navi Mumbai Airport prepared by the Center Of Environment Science & Engineering, Indian Institute Of Technology, Mumbai deals insufficiently with the environmental issues and social issues surrounding the construction of the airport. It is clear from the EIA that it was commissioned more to determine whether the area will be suitable for human inhabitation rather than to discover and mitigate human habitation on the natural environment.

The site selection criteria and analysis ignore the environmentally hazardous effects of the Navi Mumbai site in the first place. Though an impact analysis was conducted to determine environmental impacts, the mitigations proposed either do not reflect the level of necessity suggested in the EIA or are extremely vague.

Beyond the environmental impacts, it is clear that CIDCO, the governmental organization responsible for commissioning the project, used political machinations to squeeze a deal with Ministry of Environment and Forestry. In the process, they have been un-cooperative and unfair with villagers and compensation for project affected people has not been adequately described. This has created a point of contention between CIDCO and the villagers, currently.

In order to fulfill its purpose as an EIA, the document has to propose effective mitigation measures to deal with the environmental and social issues described in the impact analysis.
REFERENCES


