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\* For the full version of the research,  
visit <http://www.forum-adb.org>.

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Ramamurthi Sreedhar, Environics Trust, New Delhi, India

\* For the full version of the research,  
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visit <http://www.forum-adb.org>.

The Southwest Area Integrated Water Resources Planning  
Management Project

Kh. Azizulh Haque Moni, Ulashi Sreejony Sangha (USS),  
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\* For the full version of the research,  
visit <http://www.forum-adb.org>.

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Irshad Abbasov, Eco-Renaissance, Ganja, Azerbaijan.

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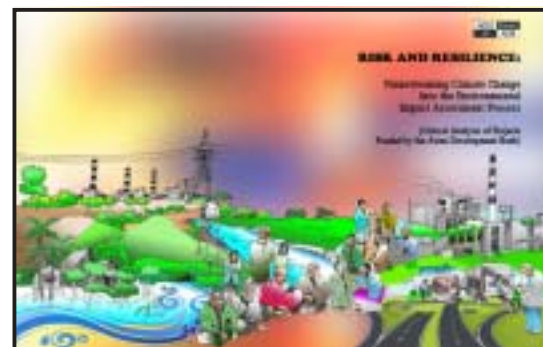
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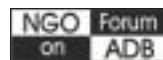
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# **RISK AND RESILIENCE:**

## **Mainstreaming Climate Change Into the Environmental Impact Assessment Process**

**(Critical Analysis of Projects Funded  
by the Asian Development Bank)**

**NGO Forum on ADB**

**December 2010**



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## Acronyms and Abbreviations

|           |   |
|-----------|---|
| ADB       | Asian Development Bank  |
| AIFRERMIP | Assam Integrated Flood and Riverbank Erosion Risk Management Investment Program |
| CARE      | Cebu Alliance for Renewable Energy  |
| CC        | Climate Change  |
| CFBC      | Circulating Fluidized Bed Combustion  |
| CSP       | Country Strategy and Program  |
| DENR      | Department of Environment and Natural Resources                                 |
| EIA       | Environmental Impact Assessment   |
| EIS       | Environmental Impact Statement  |
| EMP       | Environmental Management Plan   |
| EPIRA     | Electric Power Industry Reform Act  |
| FCD/I     | Flood Control and Drainage/Irrigation   |
| FDC       | Freedom from Debt Coalition   |
| FPCO      | Flood Planning Coordination Organization  |
| FRERM     | Flood and Riverbank Erosion Risk Management                                     |
| GLACC     | Global Legal Action on Climate Change   |
| GhG       | Greenhouse Gas  |
| IWRM      | Integrated Water Resource Management  |
| KEPCO     | Korean Electric Power Corporation   |
| KJDRP     | Khulna-Jessore Drainage Rehabilitation Project                                  |
| KNP       | Kaziranga National Park   |
| KSPC      | Korea Electric Power Company-Salcon Power Company                               |
| MOA       | Memorandum of Agreement   |
| NAPA      | National Adaptation Program of Action   |
| NAPCC     | National Action Plan on Climate Change  |
| NEIFREMP  | North Eastern Integrated Flood and Riverbank Erosion Management Project         |
| NEP       | National Environment Policy   |
| NPC       | National Power Corporation  |
| NRE       | New Renewable Energy  |
| NTPC      | National Thermal Power Corporation  |
| O & M     | Operation & Maintenance   |
| PPTA      | Project Preparatory Technical Assistance  |
| PSRP      | Power Sector Reform Program   |
| RVC       | Rural Volunteers Centre   |
| SEIA      | Summary Environmental Impact Assessment   |
| SPM       | Suspended Particulate Matter  |
| STTP      | Super Thermal Power Plant   |
| SWAIWRPMP | Southwest Area Integrated Water Resources Planning and Management Project       |
| UNFCCC    | United Nations Framework Convention on Climate Change                           |
| WRD       | Water Resources Department  |



# Executive Summary

Climate change is regarded today as an urgent issue to be dealt with at the international, national and local levels. However, climate change concerns are rarely, if ever, considered in the environmental decision-making process, especially during the process of evaluating and granting of approval to a range of projects under any sectoral investment or development models.

The link between climate change and development is evident. The World Summit on Sustainable Development (WSSD 2002) accepted the concept of ‘mainstreaming’ which involves the integration of policies and measures that address climate change into development planning. While it should now be a common practice to mainstream climate change into developmental models as pursued by countries and multilateral developmental banks, the Asian Development Bank (ADB) has failed to follow suit so far. Mainstreaming ascertains the extent to which existing development projects already consider climate risks or address vulnerability to climate variability and change or contribute to climate change, and then identify opportunities for incorporating climate change explicitly into future projects.

To evaluate ADB’s, as well as respective borrowing countries’, credibility in mainstreaming climate change, the NGO Forum on ADB (hereafter Forum) has initiated a study “Accelerating the Mainstreaming of Climate Change in National Policy Development using Environmental Impact Assessment (EIA) Processes” in four countries across Asia. The Bank’s Safeguard Policy Statement (SPS) — earlier known as the Safeguard Policy — requires a set of obligations on the EIA process to be followed and adhered to by the borrowing countries. The study aims at the EIA process which holds accountable both government and the Bank on the selection of projects and programs. The EIA process is the focus in view of the following reasons:

- The EIA is a mandatory procedure for a range of activities in order to assess in advance the environmental and social impact of a proposed project, and is therefore intended to guide the decision-makers in making an objective decision.
- The EIA process allows concerned citizens, communities and other concerned groups to raise issues of concern at the public hearing on impacts of climate change.
- In some countries, the EIA is perceived as a mere formality instead of a set of requirements that needs to be met before a project can proceed. In a period marked by deepening ecological crisis, this project encourages citizens to reclaim the EIA process as a fundamental part of the democratization and development agenda.
- Faulty approvals can be challenged before existing credible authorities wherever possible.

The objectives of the Forum’s “Accelerating the Mainstreaming of Climate Change...” are to i) ensure that climate concerns are addressed adequately in the environmental decision-making; (ii) raise critical issues on climate change during the mandatory process of public consultation, i.e., public hearing as part of the EIA process; (iii) provide support to community efforts questioning project approvals made without adequate assessment of climate change concerns; and (iv) create avenues to influence the national as well as international environmental governance.

This critical evaluation study probes five selected projects funded by the ADB that include two power plant projects, two water management projects, and one road project in Azerbaijan, Bangladesh, India, and Philippines to see if climate change considerations were sufficiently taken into account prior to Government and Bank approval for implementation and financing. The study is focused on the conduct and results of the EIA undertaken by project proponents. The lessons drawn seek to inform stakeholders on ways by which climate change could be mainstreamed in national policy development, using EIA processes as a fundamental part of the democratization and development agenda.

## Summary Findings

For the most recently approved projects by ADB, all Summary EIAs show that components of climate risks or its vulnerability were not adequately addressed in the project design and implementation. As such, ADB loan approvals were made without developing and fully integrating appropriate climate change mitigation and adaptation measures into the project and its surrounding impact areas.

### Devastating Investment in Coal-Based Power Plant

Without climate change considerations, the proponents remained unperturbed by the cumulative environmental and social costs exacted by coal-based power development projects which fuel climate change. Both the Sipat Super Thermal Power Plant (STPP) and the Visayas Base Load Power Development Project's (BLPDP) coverage of project impact on physical, ecological and socio-cultural resources blatantly show a limited one-track perspective in power sector development that utilizes coal for generating electricity. No other alternative renewable power sources were considered, and the use of coal was rationalized by the employment of allegedly clean or GHG emissions-reducing supercritical boiler technology and circulating fluidized bed combustion technology, respectively. Proponents are blind to the strategic value of investing in renewable energy sources over the misleading cost-effectiveness of coal as a fuel source.

Both projects' Strategic Environmental Impact Assessments (SEIA) play down the impact of approximately 20 million tons of GHG emissions, mainly CO<sub>2</sub>, of the Sipat STPP and about 1,006,148 tons of carbon dioxide that will be released annually by the Philippines' BLPDP in the atmosphere. The projects argue that "all emissions are guaranteed to be below national standards and World Bank guidelines for all pollutants" despite the fact that these emissions all end up in the atmosphere as added fuel to the problem of global warming. No plans of GHG monitoring and reduction were put in place.

Both projects' SEIAs are also grossly insensitive to the huge external costs of coal-based power plants that produce four times the amount of toxic ash residues. The Sipat STPP will produce about 6.4 million tons of coal ash annually from operation, while effluent discharge amounting to 1,265 m<sup>3</sup>/hour of industrial waste and 529 m<sup>3</sup>/hour of domestic waste will flush to the Lilagrah River. This is also true for the Visayas BLPD that admits to generating coal ash at a rate of about 250 tons/day and plans to flush effluents in nearby bay areas, spelling surefire disaster for coastal fisheries resources. Experts estimate that the amount of waste that would actually be produced by the Visayas plant—which contain poisonous and radioactive substances like mercury, arsenic, lead, boron, cadmium and cobalt—can reach a staggering 52.4 tons of coal ash per hour, posing threats of indiscriminate coal ash dumping in the surrounding areas.

Both projects also conveniently omit the fact that the actual impact area of the project transcends beyond the community where each plant is located, glossing over cumulative health and environmental risks faced by the communities at large. Significant natural hazards that may be brought about by climate change and its apocalyptic impact on the project and its impact area—especially the potential effects of natural hazards on hazards introduced by the project—were not factored in.

### Truncated Water Management

In India and Bangladesh water management projects, the Bank, as well as the proponent in the respective governments, failed to determine the severity of climate change impact on the lives of people residing along river banks and whose major sources of livelihood—agriculture and fisheries—are highly vulnerable from such climate risks. Rather than make communities and sectors resilient to climate change impacts, the absence of climate change considerations in these water management projects would result to a failure in its objectives to improve agriculture and fisheries production and alleviate rural people's poverty.



In Assam (India), the project's SEIA noted the possibility of increased precipitation that could increase the incidence of flooding in the Brahmaputra Basin, but offered only a structural design solution on affected embankments. The probabilities of increasing rainfall and sudden floods that will inundate downstream riverine communities around the project area were abandoned in the project equation. Furthermore, the Assam Project's SEIA also made no mention of the impact of land use change in the catchment area due to development works such as roadways, highways and new townships and industries around one subproject in the Dibrugarh area.

In Bangladesh, the project SEIA's problem analysis and project design did not consider climate change at all prior to project inception, in disregard of a National Adaptation Programme of Action which was interestingly supported by a Technical Assistance from the Bank to build the capacity of relevant government agencies to implement. The project missed out on prescribing non-structural agricultural support measures that could have strengthened local coping mechanisms such as introducing drought-resistant, saline-tolerant crops, and no-tillage cultivation approach among others. While the Bank is cautious on the increasing costs of such projects if climate concerns will be integrated, the sustainability of such projects are still left unanswered.

## **Bypassing Climate Concerns in Transport**

Meanwhile, the SEIA for the Azerbaijan Road Project is also considered inadequate when it comes to the assessment and mitigation of likely adverse environmental impacts as well as climate change effects. ADB has kept investing in Azerbaijan's transport sector, particularly road/highway improvement and construction projects, viewed as one of the chief and growing GHG-emitting sectors despite more compelling development needs from other sectors. Likewise, no specific climate-proofing strategy has been embedded in the Massali-Astara Highway Project design, despite ADB's agenda to climate-proof (i.e., identify climate risks in project planning, design, construction, operation and decommissioning) its infrastructure projects. Rather than bypassing these avowed commitments, the Bank would do well to be consistent in its climate posture by reconsidering its priority sectors for lending and seeing to it that climate change concerns are incorporated into priority development sectors. Only a climate assessment of an India road project or a Sri Lanka road project would not change the Bank's posture in its prime sector.

## **Gaps in Meaningful Consultation and Demand-Driven Project Development**

In almost all projects, gaps in meaningful consultation with affected communities and sectors were noted despite ADB's observance of social and environmental safeguards. Such gaps manifested inefficiencies and injustices in project conceptualization, design and implementation, and resulted in unfortunate development outcomes that negate the realization of people's aspirations for the betterment of their socio-economic and environmental condition.

What the studies have also shown is the enormous value of incorporating people's perceptions on climate risks and their actual experiences in adapting to a changing environment into the formulation of national and local development strategies, policies, programs and projects.

The studies have also exposed gaps in ADB's strategies and approaches for helping developing member countries towards low carbon growth paths. The Bank is sending wrong signals and putting its integrity on the line if it continues to place huge investments on projects that fuel climate change and foster people's dependency on essentially same old technologies and approaches that exact huge socio-economic and environmental costs. The Bank will likewise be criticized for its prioritization of inefficient energy and infrastructure initiatives rather than those in agriculture, forestry and fisheries, as well as its bias for the private sector, as such strategies only serve to put investment returns over and above people's rights to sustainable development.

## **Integrating Climate Change into the EIA Process**

So far, addressing climate change has been reactive than proactive although several descriptions are being provided by ADB. Despite the Bank's claim as a leader in addressing climate change in its several initiatives in Asia by its 'Asia-ness,' its investment portfolio in borrowing countries speaks differently. Additionally, the Bank claims that it has just started a climate change implementation plan that would guide the climate-related responses of all its regional departments. How this initiative will feed into projects and sectors remains to be seen though.

As we screen the portfolio investment of the Bank, it has strongly failed to mainstream climate change responses. By simply saying that 'countries in the Asia and Pacific must start planning for climate change risks' without the corresponding commitment and vigilance to seriously pursue a climate-resilient path by itself, the Bank's public stunt in responding climate change will remain to be vague.

Incorporating climate change assessment into the EIA process is now a *sine qua non*. From a mitigation standpoint, highlighting climate change considerations in the EIA process could help gauge whether projects are following a low-carbon pathway and/or aiding in the management of GHG emissions. The mainstreaming should not only encompass adaptation but mitigation processes as well.

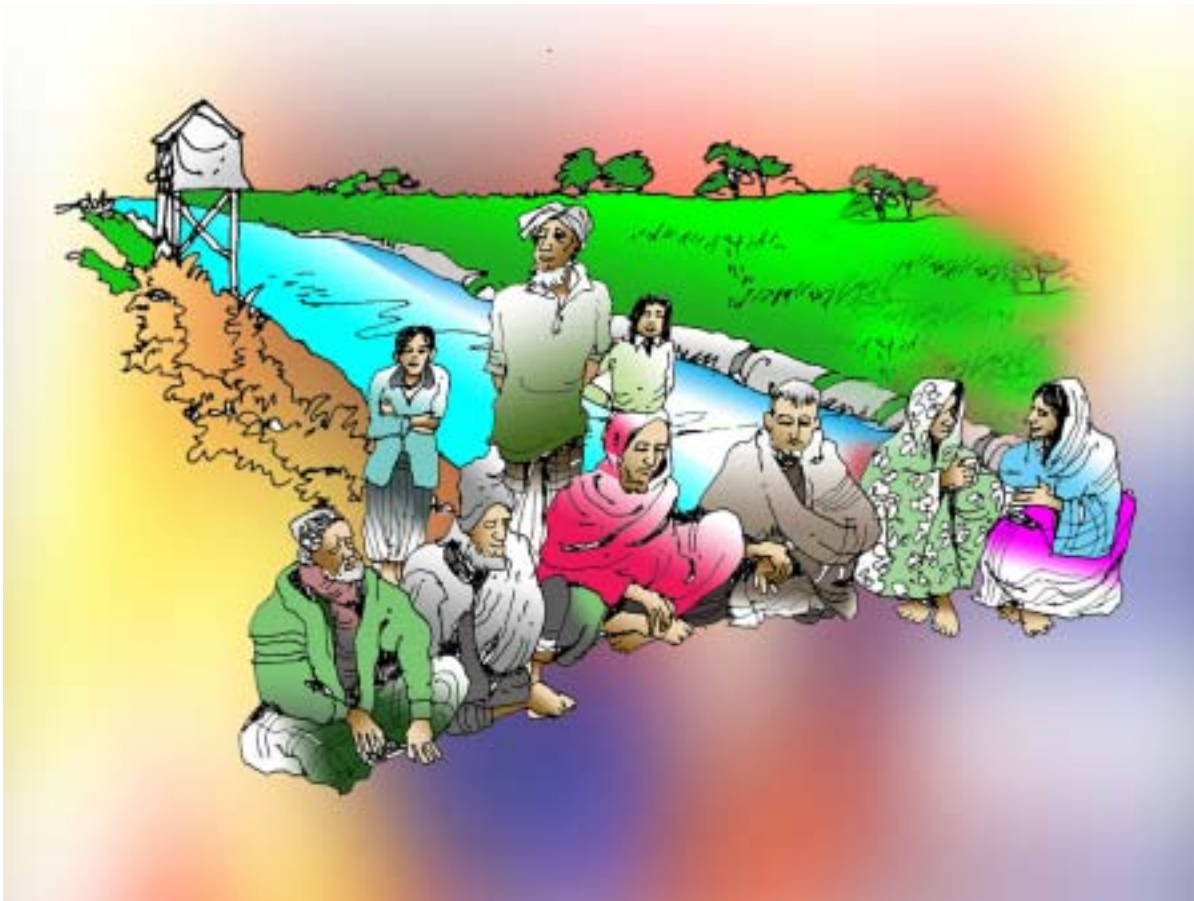
Clearly, climate change considerations can be readily mainstreamed in current EIA processes. Needless to say, this also entails that participatory channels are open and that accountability mechanisms are present. Such exercise may require a legal mandate or be merely adopted as part of due diligence. In the final analysis, there is no excuse for the ADB, and even national and local governments for that matter, not to incorporate climate change considerations into national development processes, in general, and the EIA procedures, in particular. As a leading and guiding partner of its borrowing countries, the Bank must overhaul its agenda on poverty alleviation by mainstreaming climate change, as well as minimizing the risks it has incurred through its projects and programs thus far.

**Dr. Avilash Roul**  
Executive Director  
NGO Forum on ADB

# The Assam Integrated Flood and Riverbank Erosion Management Project

**“The subproject areas may be affected by the impacts of climate change and other external events....”**

***The Rural Volunteers Centre found the adaptation track taken by the project more aspirational rather than actual, making more urgent the need for an updated impact assessment of climate change and climate contingencies, as well as for policies and mechanisms to mainstream climate change in the development agenda and planning.***



\* The full version of the research by Ravindranath and Souparna Lahiri is available at <http://www.forum-adb.org>.



**A**ssam, a northeastern state of India and one of the poorest with per capita income 45% below the national average in 2005, have long suffered from the debilitating impacts of frequent flooding – an unfortunate condition given that about 90% of its agriculture land and urban areas are located within the state’s flood-prone area. “While the state has flood embankment systems protecting 50% of its flood-prone areas, their reliability is constrained by deterioration associated with poor maintenance, failure from river erosion, and local riverbed rising.”<sup>1</sup>

According to the summary EIA prepared by the Water Resources Department of the State Government of Assam (June 2009): “The floods are caused by the runoff of extremely heavy rainfall during the monsoon and high sediment loads from upper watersheds that are geologically unstable and degraded because of deforestation and changing land use and/or shifting cultivation. Their effective management requires a long-term, basin-wide approach with a sound planning framework integrating short- to longer-term programs, including (i) better catchment management, (ii) multipurpose reservoirs where feasible, and (iii) a balanced combination of structural and nonstructural measures to cope with immediate annual flood and erosion risks.”

On 19 October 2010, ADB approved the \$120-million funding for the Assam Integrated Flood and Riverbank Erosion Risk Management Investment Program (AIFRERMIP) via the Multitranches Financing Facility.<sup>2</sup> These are provided in two tranches within a 7-year implementation period, from 2010 to 2016 (including one year for maintenance support). Tranche 1 of the said project, worth \$56.9 million, was approved on 25 October 2010.<sup>3</sup>

## Project Description

The Assam Integrated Flood and Riverbank Erosion Risk Management Investment Program (AIFRERMIP) aims to enhance the effectiveness and reliability of flood and riverbank erosion risk management (FRERM)

systems in three existing flood embankment systems (or subprojects) protecting urban, suburban, and other strategic areas of Assam: (i) Palasbari reach (74 km) in Kamrup (south) district; (ii) Kaziranga reach (29 km) in Golaghat district, adjacent to the Kaziranga National Park (KNP); and (iii) Dibrugarh reach (25 km) in Dibrugarh district. The Program also aims to strengthen the policy, planning, and institutional bases to support better FRERM operations. Comprehensive and adaptive structural and non-structural FRERM measures will be provided in the three subproject areas.

Structural measures will “focus on existing embankment systems protecting key urban and productive rural areas and requiring upgrading and protection against river erosion exploring alternative (cost-effective and sustainable) designs, whereas non-structural measures will extend to the most vulnerable locations to the impacts of chronic flooding. Significant emphasis will also be placed on establishing sound data and knowledge base to effectively manage or respond to the dynamic natural river processes while not disturbing them as much as possible.”<sup>4</sup>

Recognizing the need for a “holistic and integrated approach to flood and riverbank erosion management,” the Project has three components:

“Component I addresses the need for the enabling environment and institutional framework, particularly policy formulation, development of an organizational framework, institutional strengthening and capacity building.

“Component II will put into operation integrated practices and procedures to reduce flood and riverbank erosion risks and hazards, comprising structural, non-structural, and community-based risk management measures and the development of sustainable programs. This will focus on the three selected subproject sites in the state’s strategic locations. This component incorporates all infrastructure measures, from planning to implementation, monitoring, and adaptation.

<sup>1</sup> Water Resources Department of the State Government of Assam, Summary Environmental Impact Assessment Project Number: 38412, India: Assam Integrated Flood and Riverbank Erosion Risk Management Investment Program, ADB, June 2009.

<sup>2</sup> <http://pid.adb.org/pid/LoanView.htm?projNo=38412&seqNo=01&typeCd=3>

<sup>3</sup> <http://pid.adb.org/pid/LoanView.htm?projNo=38412&seqNo=02&typeCd=3>

<sup>4</sup> <http://pid.adb.org/pid/LoanView.htm?projNo=38412&seqNo=01&typeCd=3>



“Component III addresses project management, with the Project to be implemented through WRD, supported by consultants, NGOs, and outside organizations” (SEIA June 2009).

The three subprojects under component II will develop and implement a range of modern structural measures, along with non-structural measures, that will focus on the prevention of the flood and erosion threat. These have been selected as the priority subprojects for implementation under the Program, and they represent the different types of floodplains in Assam. The

Dibrugarh subproject is an example of a densely populated town area. The area of Palasbari is designated for future industrial development, and is expected to change from predominantly agricultural land use to manufacturing and industries. Kaziranga represents an agricultural area with a nearby world heritage site. In total, about 129 km of riverbank, or about 10% of the total length of the Brahmaputra banks, are covered by the core areas with the potential to address erosion, if necessary. The benefited area is estimated to be about 100,000 hectares (ha).

| The Three Subprojects  |  |   |
|--|--|---|
| Subproject   | Scope  |   |
|  | Tranche 1  | Tranche 2   |
| <p><b>Palasbari</b></p> <p>on the southern bank of Brahmaputra River; spans a 74-km reach from the confluence of the Kanjan River near Guwahati to the confluence of the Jaljari River</p>   | <p>The first tranche will retire 4.9 km of existing embankments supported by 7.0 km of revetment alongside the most erosion-prone reach.</p>   | <p>Includes 13.6 km of revetment and pro-siltation measures, rehabilitation of three boulder deflectors, and two gated drainage sluices. In addition, the Program will support the provision of sufficient maintenance of existing embankments (70 km).</p>   |
| <p><b>Kaziranga</b></p> <p>adjacent to Kaziranga National Park (KNP), extending from its border upstream (eastward) and covering about a 29-km reach along the Brahmaputra River to Bankoal past the Dhansiri River confluence</p> | <p>Will provide (i) 4.7 km of new inner secondary embankment to prevent the sudden intrusion of floodwater into KNP in case the frontline Brahmaputra dyke is breached, (ii) three sluice gates along the KNP boundary dyke, and (iii) 3 km of riverbank protection through pro-siltation measures using porcupines.</p> | <p>Includes (i) renovation of 18.7 km of existing embankments on the western side of the Dhansiri River, and (ii) 6 km of pro-siltation measures upstream and downstream from the Dhansiri confluence. In addition, the project will support the provision of sufficient maintenance of the existing embankments (35 km).</p>       |
| <p><b>Dibrugarh</b></p> <p>covers about a 25-km reach, including Dibrugarh town, and extends upstream towards Oakland.</p>   | <p>The first tranche includes (i) strengthening of 9.5 km town protection embankment, (ii) 1.8 km of bank protection through pro-siltation measures along the town protection dykes, and (iii) 2.4 km of bank protection near Oakland areas through sand-filled geo-textile revetment.</p>                               | <p>Includes (i) strengthening of 4.7 km of the existing tributary dyke, (ii) rehabilitation of seven spurs along the town protection embankment, (iii) two gated sluices, and (iv) a 9.5 km inspection road. In addition, the project will support the provision of sufficient maintenance of the existing embankments (21 km).</p> |



## Scope of the EIA

The EIA report of the project was prepared under the *Environment Assessment Guidelines of the Asian Development Bank* and the guidelines of the Government of India. The SEIA “covers the impacts of both tranches of the MFF in the three subprojects included in the Program” (i.e., an environmental assessment and review procedure for future tranche works is not necessary, according to the SEIA report). The Water Resources Department (WRD) prepared the EIA and the SEIA through a consultative process of review by the Asian Development Bank (ADB) and other stakeholders. A multidisciplinary team of consultants assisted the WRD in conducting the environmental impact assessment (EIA) during the project preparatory technical assistance (PPTA), which was carried out during April 2007–December 2008. It was based on a range of data, including those obtained from surveys for the PPTA. The state government of Assam has accepted the EIA reports. No formal approval is required from the Government of India in accordance with existing environmental law in India, according to the SEIA report (June 2009).

As stated in ADB’s *Environmental Assessment and Review Framework for Small-Scale Community Flood Risk Management Works*: “The scope of EIA involved the assessment of major structural components of each subproject that includes embankment rehabilitation and upgrading, construction of new dykes, installation of sluice gates, revetment, and pro-siltation works. Although the subproject structural works are divided into two tranches, the subproject EIAs and the project SEIA have already covered all the major structural measures. The EIA will be updated, as needed, to reflect possible changes in its design and timing of implementation on the one hand, and reflecting the actual impacts observed during the tranche 1 implementation. These changes in the EIA will undergo the same review and dissemination following the ADB guidelines.”<sup>5</sup>

The individual subproject EIA and associated environmental management plan (EMP) may be revised for the second tranche if the project design is changed based on the implementation and monitoring

results of the first tranche (SEIA June 2009). Both the Dibrugarh and Kaziranga EIA documents indicate that experts consulted in the preparation of the report are mostly related to environment in general, geology, zoology, soil conservation and testing and air, water and noise pollution. No climate specialist is on the panel.

## Climate Assumptions in the EIA

The ADB has categorized the project as “Medium – Adaptation” (based on its current project classification system), meaning, the project addresses climate change through adaptation, with medium impact (i.e., 25-40 percent impact contribution to adaptation).<sup>6</sup> The SEIA reported that “more cost-effective and flexible options that can adapt to the dynamic river process should be explored. Alternative risk management measures need to be pursued in other areas, such as flood proofing, strategic retirement of embankments, and a range of non-structural measures including flood and erosion risk prediction and mapping, advance warning, and safety nets for the people threatened and displaced by flooding and river erosion. Comprehensive strengthening of the policy, planning, and institutional basis, data, and knowledge base are also required, along with the effective participatory mechanisms to ensure accountable program delivery and management” (SEIA June 2009). In the operational phase, as reported in the SEIA, “the proposed Program is not anticipated to have any impact on the climate.”



**WEARING AWAY.** River erosion on Brahmaputra near Dibrugarh. Photo courtesy of Souparna Lahiri.

<sup>5</sup> The environmental assessment and review framework (EARF) has been prepared “as a supplementary appendix for the community-based flood risk management measures. These will be defined in consultation with the communities and may include minor community infrastructure, such as village platforms and evacuation centers” (SEIA June 2009).

<sup>6</sup> The “climate change marker” is a fairly recent feature; Low Impact = 5-20 percent; High Impact = 45-100 percent; see, ADB, *Staff Instructions for the Revised Project Classification System*, January 2009.



In the construction phase, the SEIA concedes that the “temperature may rise in the short-term in the immediate vicinity of the embankment because a large number of trees will be cut down” (e.g., about 15,000 trees in Palasbari, 2,000 trees in Kaziranga, and 10,000 trees in Dibrugarh). As a mitigation measure, compensatory tree plantation will be undertaken on the basis of planting three trees for every tree cut.

“However, climate change (global warming) in the catchments area may play a significant role because of its implications on water resources and related environments,” the SEIA mentioned. There could be “an increase in precipitation for the Northeastern region as a result of a relatively moderate increase in temperature of about 2°C by 2041–2060” that could increase the incidence of flooding in the Brahmaputra Basin over the long term. Free board of 1.5 m is incorporated in the proposed design of the embankments “to withstand floods of a return period of up to 100 years within the 30-year economic life of the Program.” Plus, it has been advised that the feeder line inflow–outflow of water to wetland areas must be maintained, with provision of sluice gates to be made in the embankment (SEIA, June 2009).

Nonetheless, the possible impact of climate change on the downstream Brahmaputra and its riverine communities around the project area has been completely neglected. No assessment has been made on the impact of any climate change on the riverine communities in the project areas and their livelihoods such as impact of variation in rainfall and sudden floods on agriculture, especially on women. The EIA is also silent on the impact of land use change in the catchment area due to development works such as roadways, highways and new townships and industries around the Dibrugarh subproject. Similarly, there is no effort towards a rigorous assessment of the impact of construction work on the wildlife in Kaziranga National Park (KNP) and its biodiversity, a key conservation and ecologically sensitive area in the northeast.

ADB’s EIA guidelines do not talk about a separate assessment for impacts of climate change. Only par. 114 in the guidelines states that: “In determining appropriate environmental standards for ADB projects, ADB will follow the standards and approaches detailed in the World Bank’s *Pollution Prevention and Abatement Handbook*.” This handbook describes generally acceptable pollution prevention and abatement measures and emission levels. However, as



**COPING MECHANISM. Traditional spurs on Brahmaputra**  
Photo courtesy of Souparna Lahiri.

in the case of the World Bank environmental assessment procedures, the environment assessment for any individual project may recommend adoption of alternative emission levels and approaches to pollution prevention and abatement.

India’s National Action Plan on Climate Change (NAPCC) is also silent on the need to mainstream climate change impacts through environment impact assessment. The NAPCC only states that reliable ‘assessments should be made on the impact of climate change on water resources.’

The EIA 2006 Notification, which is the outcome of the National Environment Policy (NEP) 2006, is silent on the impact of climate change and how to address that through regulation of emissions. The Government of India’s guidelines on EIA still do not have components to address and assess climate change. The project under evaluation does not even need an EIA and/or mandatory public hearing, as per the EIA 2006 Notification (i.e., flood control was taken out of the schedule of the EIA notification for Category A and B projects).

### **Incorporating Climate Change Adaptation Considerations in the IFRERMIP**

The ADB clearly stated in the project document that the AIFRERMIP is a medium-impact, adaptation-related project. Yet, the lack of a comprehensive climate change adaptation assessment, whether separate or embedded in the EIA, makes the avowed adaptation tract more aspirational rather than actual.



The justification for including a climate change assessment in the EIA process has already been laid down in the project documents: the Government (of India), in its 11th five-year plan, has accorded high priority to flood management, which is “in line with the paradigm shift of the country’s disaster management strategy to focus more on preparedness” as opposed to post-disaster responses, as well as a growing concern on the impacts of climate change (WRD, June 2009). Also, India’s National Environment Policy (NEP) 2006 stressed “the need for adaptation to future climate change, and the scope for incorporating these in relevant programmes, including watershed management, coastal zone planning and regulation, forestry management, agricultural technologies and practices, and health programmes.”

The SEIA report on the project stated that the “subproject areas may be affected by the impacts of climate change and other external events, including major earthquakes and upstream development works such as hydropower development.” Also, it has been pointed out that “increased precipitation is one possible climate change impact in the North Eastern region by 2040–2060, although opinions vary.” It would be perilous to merely rely on “systematic monitoring of the river dynamics” (which, as promised, will be strengthened under the Program) to “facilitate the identification and implementation of necessary measures to adapt to any emerging changes in the construction and post-construction phases of the subprojects” (including the establishment of warning systems).<sup>7</sup> A clear, comprehensive, implementable disaster management model for the project areas must be formulated.

The Brahmaputra River Basin, which is highly volatile and unstable in terms of its geomorphology and hydrology, has a huge catchment area that falls within Arunachal Pradesh, drained by at least five major river basins originating in the eastern Himalayas.<sup>8</sup> The hydrological flow of this basin could be influenced not only by glacial retreat and intense variation in the patterns of rainfall throughout the basin but, more alarmingly, by the more than 100 proposed large

hydroelectric projects in Arunachal Pradesh. The SEIA states that “the Program takes an adaptive approach with substantial contingencies to respond to river changes,” but the Environment Management Plan does not show any concrete and understandable model of adaptation that will be undertaken in this project.

All these possible impacts emerging out of the inevitable changes in the ecology and the surrounding environment need to be assessed under the NEIFREMP. Climate change considerations need to be mainstreamed into the project to ensure the viability of the project itself and to maximize its avowed benefits. The EIA of NEIFREMP should, therefore, look into the following:

- Technology options which reduce impact of climate change and GHG emissions;
- Changes in rainfall pattern in the Brahmaputra Basin;
- Construction of more than 100 proposed mega hydropower projects on various river basin and tributaries of Brahmaputra in Arunachal Pradesh in the upper catchment area;
- Diversion and deforestation due to development projects such as roadways and hydropower in Arunachal Pradesh and in the vicinity of the project area
- Changes in the land use policy arising out of various road projects like highways, expressways, hill roads in the States of Arunachal Pradesh and the project areas in Assam;
- Glacial retreat in the eastern Himalayas;
- Use of non-renewable and energy-intensive technology, fuel and raw material in the construction of the project;
- Emission levels during construction including that of GHGs;
- Possibilities of disaster arising out of climate change in the project area and mitigation within the purview of the NEIFREMP; and
- Possibilities of impact of climate change on agriculture in the project area; thus, reducing the positive impacts of NEIFREMP.

<sup>7</sup> As presented in par. 98, p.28 of SEIA report, June 2009. It is also bared in the report that the WRD, at the moment, “has limited capacity to address the environmental measures in-house. As such, the institutional capacity of the WRD needs to be enhanced with regard to environmental training, monitoring infrastructure, and environmental guidelines. Adequate training will be imparted as proposed under the EMP to increase its capability.”

<sup>8</sup> From a geomorphologic standpoint, the basin falls under seismic zone V (the highest damage risk zone under India’s earthquake hazard zoning system). That makes the area very susceptible and vulnerable to riverbank erosion, landslides and landslips in the hills due to infrastructure works such as road building and hydro projects. Also, major land use changes result in heavy sedimentation load and silt deposition in the downstream portion.





The case of “small island developing states” or SIDS is inspiring. They have already shown “particular interest in the use of EIA as a tool to incorporate considerations of climate change in projects. A key motivation for this has been the high exposure of many of these countries to extreme climatic events, and the possibility that many of these hazards could be exacerbated by sea-level rise and increases in the intensity or frequency of tropical cyclones” (Agrawala et al., August 2010).<sup>9</sup> According to Agrawala et al. (August 2010), “some SIDS already recognise the need to use EIA as a tool to adapt to climate change in their National Communications to the United Nations Framework Convention on Climate Change (UNFCCC) and/or National Adaptation Programmes of Action (NAPA).” For instance (based on Agrawala et al., August 2010):

- Samoa’s National Communication recognizes the importance of using EIA to promote adaptation in development plans and protect biodiversity from climate change. Samoa’s NAPA, meanwhile, emphasizes the mainstreaming of NAPA activities in existing legislation supporting sustainable development including EIA, to wit: climate change factors are increasingly being assessed against development proposals in EA and EIA regulations formulation process;
- Kiribati’s NAPA highlights that adaptation strategies for coastal zone management must consider the need to carry out EIA on any coastal development. Kiribati already considers the integration of climate change adaptation in EIA processes (as per Environmental (General) Regulations, 2007, Section 33 (1) (d) of the Environment Act). The scope for a basic EIA makes explicit reference to climate change and requires a “description of how climate change and climate variability may impact on the activity”;
- The NAPA of the Solomon Islands notes that all development infrastructure projects require an EIA but that climate change-related risks are not specifically taken into account as part of this process. This NAPA identifies EIA as one of the entry points for adaptation for the development and building of additional tailing ponds and dams for the mining sector (Government of Solomon Islands, 2008);
- Vanuatu’s NAPA identifies the use of EIA as a way to mainstream climate change considerations in infrastructure design and planning as a priority adaptation;
- The National Communication of the Cook Islands argues that the current coastal vulnerability to climate change is exacerbated by “the lack of an effective EIA process as well as a fully integrated environmental management program.”;
- Dominica’s National Communication states that measures should be taken to ensure that climate change considerations are integrated into the EIA process. Furthermore, it states that this should be adopted in conjunction with hazard mapping and risk assessment to define the extent of impact-prone areas, and that comprehensive hazard information should become available for use by private, commercial and industrial developers to inform strategies for sustainable land use and economic development; and
- St. Lucia’s National Communication states that it will upgrade EIA legislation to consider climate change considerations.

## Recommendations

1. ADB guidelines on the preparation of the Environment Impact Assessment Report must be updated with impact assessment of climate change and climate contingencies. It is imperative that the ADB and its member countries, like India, immediately develop and establish policies and mechanisms to mainstream climate change in their development agenda and planning.
2. Though the National Environment Policy of India acknowledges the impact of climate change, no guidelines have since been issued by the concerned Ministry to incorporate climate change and its impact into the assessment tools. The EIA Notification 2006 needs to be suitably amended to incorporate climate concerns, contingencies, minimum emission levels and regulation of GHGs. The standards used for categorization of projects

<sup>9</sup> Agrawala S., A. Matus Kramer, G. Prudent-Richard and M. Sainsbury, “Incorporating climate change impacts and adaptation in Environmental Impact Assessments: Opportunities and Challenges”, *OECD Environmental Working Paper No. 24*, OECD Publishing, August 2010.



related to mining, thermal power, river valley projects, industry and infrastructure need to be developed in terms of fossil fuel and GHG emission and impact on ecology and climate—and not in many cases in terms of output and land area used. Similarly, any change in existing land use due to projects of any kind and nature has to be evaluated in terms of its impact on climate and ecology.

3. As India's National Action Plan on Climate Change (NAPCC) correctly accepts the susceptibility and vulnerability of water resources to climate change and its impact, any project related to water resources in a river basin and valley should undergo climate change impact assessment and/or analysis.
4. The Indian government, as part of its water mission under the NAPCC, should come out with reliable assessment of the impacts of climate change and global warming on the Himalayan water resources and river basins.
5. While assessing the impact of climate change on a particular project, special emphasis should be given on the impacts on vulnerable communities and section of the people such as tribal and indigenous communities, natural resource-based communities, agricultural communities and women in general.
6. The entire Brahmaputra River Basin—being an important component of a resource-rich northeast India in terms of its water, forests and biodiversity, and comprising of communities heavily dependent on these resources—should be subjected to a cumulative and basin level assessment of climate change impacts before any project is undertaken.
7. Develop a “climate vulnerability index” for vulnerable areas like hills, river basins, forests, mining sites that could be used as a baseline for future assessments.

# The Sipat Super Thermal Power Project

**“Coal remains the primary fuel  
for meeting existing and future electricity demand”**

*The report by Environics Trust found violations of the ADB's environmental, social and climate safeguards occurring at the project level, betraying a warped perspective of power sector development that serves as fodder for the perpetuation of poverty and acceleration of climate change.*



\* The full version of the research by Ramamurthi Sreedhar and Nishant Alag of Environics Trust, New Delhi, India, is available at <http://www.forum-adb.org>.



India is experiencing a power supply deficit<sup>1</sup> despite substantial generation capacity, which is about 4 percent of global power generation.<sup>2</sup> The Indian government has set ambitious goals in the 11th plan for the power sector, as it aims to meet electricity demand in full by 2012, provide all households with electricity within 5 years and increase the per capita availability of electricity to over 1,000 kilowatt hours by 2012. To meet this demand, initiatives are underway for the installation of new coal- and gas-fired thermal power stations, and of hydropower—a move that a number of professionals are challenging because of its disregard for alternative sources.

### Project Brief

The Sipat Super Thermal Power Plant (STTP) is a project of the NTPC Limited (formerly National Thermal Power Corporation Limited; India's largest power company) utilizing supercritical boiler technology<sup>3</sup> (for Stage I) to improve the plant's thermal efficiency and reduce greenhouse gas emissions compared with standard boiler equipment. It is the first implementation of supercritical technology in India that will demonstrate how thermal projects can convert energy resources into electricity more efficiently and more cleanly while utilizing coal for base-load power plants. The plant will contribute an additional 4,480 MW of installed capacity to the Indian grid, making a substantial contribution to meeting the current shortfall of supply and to meeting the electricity supply targets set out in the Tenth Five-Year Plan (2002-2007). The total annual electricity generation from the Sipat STTP will be 20,883 GWh, with generated electricity supplying the western region of India via Seoni. The Sipat STTP site covers 1,773 ha (4,382 acres) that features the following:

- (i) 3 x 660 MW supercritical and 2 x 500 MW subcritical steam generators;
- (ii) high-efficiency electrostatic precipitators (ESPs);
- (iii) 2 x 275 m high twin flue emission stacks, 1 x 275 m high single-flue stack;
- (iv) 765 kV, 400 kV and 132 kV switchyards;
- (v) A merry-go-round rail transport system;
- (vi) A pump house and 2 x 29 km water supply pipelines;
- (vii) A circulating water system with induced draft cooling towers;
- (viii) An ash water recirculation system, effluent treatment plant and central monitoring basin;
- (ix) 3 x raw water reservoirs;
- (x) 3 x ash dykes; and
- (xi) A township.

The Sipat STTP Project is part of the first loan syndication deal for a state-owned enterprise in India without sovereign guarantee under ADB's Multitranchise Financing Facility.<sup>4</sup> The loan comprises of (i) a tranche of \$75 million loaned directly to NTPC and (ii) a tranche of \$225 million participated in by commercial banks under ADB's Complementary Finance Scheme. The loan finances a portion of NTPC's power generation capacity expansion, including a portion of the foreign exchange requirements of Sipat STTP and the Kahalgaon Thermal Power Plant Project (Stage II) in Bhagalpur, Bihar.<sup>5</sup> The Project beneficiaries are Western Region States, namely, Chhattisgarh, Madhya Pradesh, Maharashtra, Gujarat, Goa, Daman & Diu and Dadar Nagar Haveli.

<sup>1</sup> According to the India Ministry of Power, the total national shortfall in electricity is estimated to be 8.3% of demand in 2006. About 44% of households do not have access to electricity (SEIA, 2006).

<sup>2</sup> India's installed capacity is 152 GW as of 2009, with an average per capita consumption of electricity estimated at 704 kWh during 2008-09. The world average stands at 2,300 kWh. *Source:* [http://www.in.kpmg.com/TL\\_Files/Picture/PowerSector\\_2010.pdf](http://www.in.kpmg.com/TL_Files/Picture/PowerSector_2010.pdf)

<sup>3</sup> These supercritical boilers operate at higher temperatures and pressure than traditional technology. Supercritical coal-fired power plants can achieve thermal efficiencies of up to 40%, compared with the standard 37% level. A 1% increase in efficiency can reduce specific emissions (such as carbon dioxide, nitrogen oxides, sulfur oxides, and suspended particulates) by approximately 2.6% (SEIA, 2006).

<sup>4</sup> An MFF establishes a partnership between ADB and a client for the purposes of working in a sector or sectors. It has features of a standby letter of credit, and can be used to extend debt finance and advice for (a) large stand-alone projects with interrelated components, (b) investment programs with interconnected components in a sector or sectors, and (c) credit lines for small and medium-sized enterprises and local governments (*Source: ADB, Mainstreaming the Multitranchise Financing Facility*, June 2008).

<sup>5</sup> ADB Report and Recommendation of the President.



| Power Generation Sources of India |                         |             |
|-----------------------------------|-------------------------|-------------|
| Source                            | Installed Capacity (MW) | Percentage  |
| Coal                              | 85,193.38               | 53.3        |
| Gas                               | 17,055.85               | 10.5        |
| Oil                               | 1,199.75                | 0.9         |
| <b>Total Thermal</b>              | <b>103448.98</b>        | <b>64.6</b> |
| Hydro (Renewable)                 | 36,913.40               | 24.7        |
| Nuclear                           | 4,560.00                | 2.9         |
| RES** (MNRE)                      | 16,429.42               | 7.7         |
| <b>Total</b>                      | <b>161,351.80</b>       | <b>100</b>  |

Renewable Energy Sources (RES) include SHP, BG, BP, U&I and Wind Energy. The installed capacity figures are reconciled and indicate latest operation/deration capacity  
 Source: Central Electricity Authority as of 31.05.2010

Construction of Sipat STTP Stages I and II began in late 2003, and substantial work has been completed. Stage II (2 x 500 MW units) has been completed before stage I - the second 500 MW Unit of Stage II, has been successfully coal fired 10-11-2008. After its synchronization, the project has attained full capacity of 1000 MW under Stage II. The first 500 MW Unit of Stage II has been already under commercial operation since June 2008.

## Scope of the EIA

The Environmental Impact Assessments (EIAs) for Sipat STTP Stages I and II were prepared by the NTPC following government planning requirements, and covered the construction and operation phases of each development. A Due Diligence Review of associated facilities was conducted on seven high-voltage transmission lines and two substations being constructed that will transmit power from the plant to the western region, as a way of overseeing whether the lines complied with Government of India law and policy and ADB standards. The project was given all necessary clearances and approvals required by the Ministry of

Environment and Forestry and the State Pollution Control Board with the completion of the EIA and the conduct of public hearings.<sup>6</sup>

The Summary Environmental Impact Assessment (SEIA) report identified the primary adverse impacts of the Project, which include land acquisition, land use conversion, air quality decline, water use, and solid waste and effluent generation:

It was also found that “construction of the proposed transmission lines will also require the clearance of 534 ha of forest<sup>7</sup> along 84 km of right-of-way, but that no rare, threatened, or endangered species would be affected. The environmental and social impact of these lines and substations were assessed as part of the Sipat Transmission System Subproject. No historic or cultural monuments are affected. Sanctuaries and national parks have been avoided. The only agricultural land that will be lost is the foundation area of each tower (estimated to be 0.2–1 m<sup>2</sup> per average farm holding). No resettlement is required along any route, but the resettlement of 36 people at the Seoni substation site (43 ha) and 17 people at the Rajgarh substation site is likely.”

<sup>6</sup> Summary Environmental Impact Assessment, March 2006.

<sup>7</sup> The transmission line routes were selected to avoid communities (with special reference to tribal communities) and resettlement, monuments of cultural or historical importance, conservation areas (e.g., sanctuaries, national parks, wildlife reserves, reserve forests) and areas of other natural resources (e.g., agricultural land). In addition, the lines will be set back 10–15 km from major towns, where possible, to accommodate future urban expansion, and wetlands and unstable areas will be avoided. The most sensitive sites affected by the selected 765 kV routes (chosen from three alternatives) are the crossing of 20 km of reserve and social forest and the crossing of the Kawarda and Mandala tribal areas. The sensitive sites affected by the 400 kV lines include (i) Seoni–Khandawa (46 km of reserve and protected forest crossed); and (ii) Nagda–Dehgam (a large number of trees will be cleared from revenue land and about 60% of the route will pass through tribal belts in Madhya Pradesh and Guajrat (Sourced from the project SEIA).



| <b>SIPAT Super Thermal Power (STTP) Plant of NTPC</b>   |   |
|---|---|
| <b>Location</b>   | Sipat, Tehsil Masturi, District Bilaspur, Chhattisgarh                                    |
| <b>Coordinates of Plant Site</b>                        | 22° 7'52.36"N, 82°17'30.59"E  |
| <b>Stage I</b>  | 1,980 MW (3 x 660 MW units) using supercritical technology                                |
| <b>Stage II</b>   | 1,000 MW (2 x 500 MW units) using conventional boilers or sub-critical technology         |
| <b>Affected Villages</b>                                | A total of 8 villages, including Rank, Devri, Kaudia, Janji, Sipat, Masturi, among others |
| <b>Affected Families</b>                                | 3,106 families  |
| <b>National and State Government Approvals Obtained</b> |   |
| <i>January 2000</i>                                     | Techno-economic Clearances were provided by the Central Electricity Authority             |
| <i>13 January 2004</i>                                  | Environmental Clearance for Stage I granted by the MOEF                                   |
| <i>6 January 2004</i>                                   | No Objection Certificate granted by the Chhattisgarh State Pollution Control Board        |
| <i>8 June 2004</i>                                      | Environmental Clearance for Stage II granted by the MOEF                                  |

The SEIA’s main conclusions noted some mitigation measures that will be undertaken: “The decline in ambient air quality will be mitigated by the use of coal with a sulfur content of around 0.36%; use of a two-stage combustion process that reduces the formation of thermal nitrogen oxide in the furnace; trapping more than 99.9% of fly ash in high-efficiency electrostatic precipitators to limit emissions to less than 50 mg/Nm<sup>3</sup>, in line with the World Bank and ADB limits; and installing 275 m high stacks that promote higher mixing. About 40% of the ash produced as a by-product of combustion over the initial 9 years of plant operation will be utilized, with 100% of ash to be utilized beyond this period. The main uses will be fly ash-based Portland Pozzolana cement manufacturing, clay-fly ash brick manufacturing, road and embankment construction, agriculture and wasteland development and mine filling. Effluent from plant processes will be reused or treated according to Government of India standards for inland surface waters before discharge. Other major impact mitigation measures include a coal dust suppression system and an extensive afforestation program.”

The regular monitoring of environmental features that relate to the main project impacts, such as local meteorology, flue gas emissions, local ambient air quality, surface water and ground water quality, discharge effluent quality, soils, aquatic ecology, and noise levels— will also be regularly monitored to check compliance with project approval conditions and pollution standards.

### **Climate Assumptions in the EIA**

The Sipat STTP EIA’s coverage of project impact on physical, ecological and socio-cultural resources shows some implicit concern for climate change, but response for such concerns was inadequate and limited by the proponents’ perspectives on power sector development. There were no other alternative power projects presented other than a coal-fired thermal plant project utilizing the more environment-friendly supercritical boiler technology that would ensure reduced GHG emissions.

NTPC’s use of technological interventions to bring down the carbon footprint to a marginal level is offset by high coal ash production as well as effluent discharges. The SIPAT STTP SEIA estimates that approximately 20 million tons of greenhouse gases will be emitted by the plant each year, mainly as carbon dioxide. It will also produce about 6.4 million tons of ash annually from operation (about 4.25 million tons from stage I and 2.15 million tons from stage II). Effluent discharge from the plant amounting to 1,265 m<sup>3</sup>/hour of industrial waste and 529 m<sup>3</sup>/hour of domestic waste will flush to the Lilagrah River. The SEIA identified various mitigation measures that will be incorporated in the project design to address these, as well as other primary and secondary impacts.

While the SEIA covered a more or less detailed environmental assessment of the project, there appears to be some oversight in the range of cumulative impacts brought on by the project and other nearby



### Primary Adverse Environmental and Social Impacts of Sipat STPP

| ISSUE/FEATURE            | IMPACT   | EXTENT  | DURATION  |
|--------------------------|--|---|-----------|
| Land Acquisition         | • Acquisition of private agricultural land and government land                             | 1,773 ha, including 687 ha, of private land. No resettlement required.  | Permanent |
| Land Use Conversion      | • Conversion of private and government land to power station facilities                    | 210 ha good agricultural land, 476 ha lower class private land, 74 ha forestland, 823 ha of mainly barren government land | Permanent |
| Air Quality              | • Decline in local/regional air quality from plant emissions• Emission of greenhouse gases | Ambient air quality will marginally decline in the locality. About 20 million t annually.                                 | Permanent |
| Surface Water Extraction | • Water extraction from the Hasdeo barrage via the right bank canal                        | 3.72 m3/sec initially, reducing to 3.16m3/sec with ash pond recycling   | Permanent |
| Solid Waste              | • Ash production and disposal  | 6.4 million t annually  | Permanent |
| Effluent                 | • Effluent discharge into the Lilagrah River   | 1,265 m3/hour of industrial waste and 529 m3/hour of domestic waste   | Permanent |

ha = hectares, m = meter, t = ton.

Source: *Envirotech Consultants. 1998. Sipat Super Thermal Power Project - Comprehensive Environmental Impact Assessment Report. New Delhi: National Thermal Power Corporation Ltd.*

industries. The SEIA states: “The Sipat STPP will not contribute to local or regional adverse cumulative impacts from industry on air and water quality, as there are no major industries near Sipat.” The nearest large-scale coal-fired thermal power plant in the Korba area about 90 km from Sipat was not considered as part of the impact zone. This is also true for air and water regimes in upstream impact zones covering coal mining areas where Sipat’s coal supply is sourced and transported, as well as in the Hasdeo Dam Area where water is drawn. Quantifying and valuating the impacts in these areas are very difficult and prone to debate but it would be prudent to consider the synergistic impact of all the projects and/or industries and all elements of each. For example, air quality modelling using the industrial source complex version for atmospheric dispersion of stack emissions was undertaken to assess the decline in air quality from the combined stage I and II plant. This modelling, run for the worst meteorological conditions for atmospheric dispersion, predicted ground level concentrations of particulate matter, sulphur dioxide and nitrogen oxide over a 20 km by 20 km area centred on the plant. Thus if emissions of these related projects/industries are accounted for, the impact area would be over a thousand square kilometres.

Significant natural hazards that may be brought on by climate change and its potential impact on the project and its impact area—especially the potential effects of natural hazards on hazards introduced by the project—were not factored in.

Despite growing concern for climate change in India, climate change concerns are still rarely considered in environmental decision-making processes, especially during evaluating and granting approval to a range of projects, which average 800/year and include mining, power, and other infrastructure projects. Government guidelines on the EIA have no climate change considerations. A major challenge facing India now concerns how to reconcile rapid growth targets in energy production, especially in the coal power sector, with the increasing urgency to address climate concerns. ADB’s country strategy for India supports the country’s priority to achieve high growth targets by upgrading infrastructure facilities and improving efficiency of public services. It supports the Government’s mission of Power for All by 2012. ADB’s strategy for the power sector will be in synergy with the 10th and 11th plans. This includes national and state interventions and, specifically, references supporting power generation through NTPC.

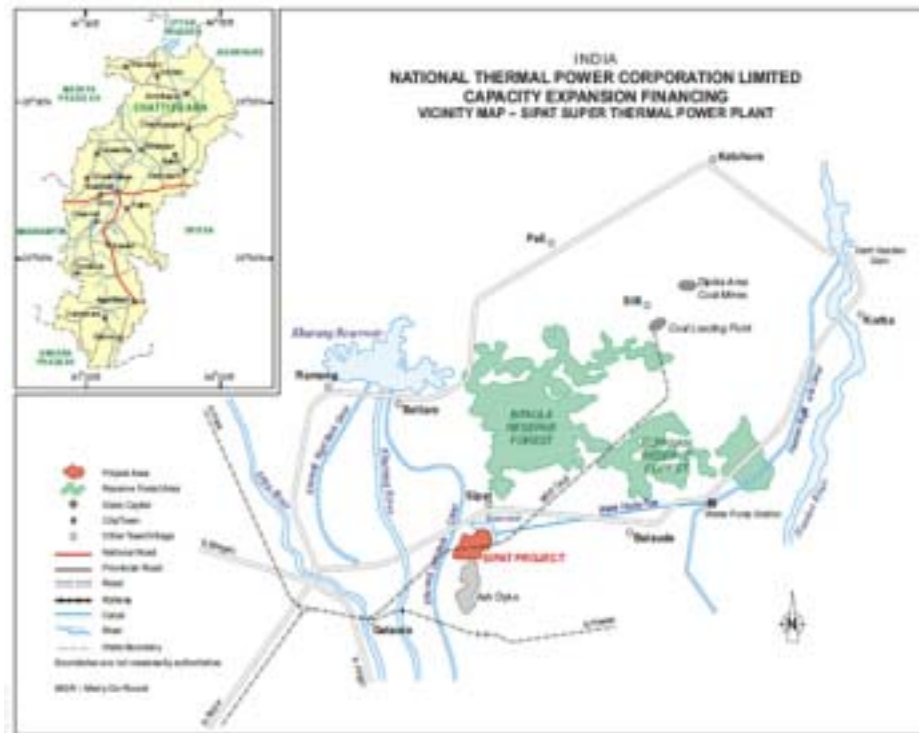


## Safeguards Oversight

The SEIA states that land acquisition and conversion was done in relation to plant construction, and that corresponding resettlement and compensatory actions were provided for affected families. Other ADB reports have indicated that “resettlement and indigenous people’s aspects in relation to the Sipat STTP project were undertaken in various locations within the plant site and other associated facilities, including access roads, water pipelines, reservoirs, coal transport system, ash dykes, and transmission lines for evacuation of power,” and that “all affected households were compensated.”<sup>8</sup> However, there are reports that show irregularities or violations of social and environmental safeguards. These include the following:

Project authorities have excluded homesteads from the list of households affected by land acquisition activities,

disregarding as much as 3,106 families that were dislocated by the project. If households within the Depict Block expanded mine site where the Sipat STTP will source its coal is included, there could be as much as 6,000 to 7,000 families affected that were not adequately compensated. The expansion of the coal mine and coal transport lines going to the Sipat STTP site have infiltrated agricultural and forest lands where small farmers and indigenous families source their livelihood. Additionally, the SEIA indicated that “water for the project will be pumped from the right bank canal that is fed by the Hasdeo barrage located about 65 km from the site,” depriving thousands of hectares of farmland with much-needed irrigation water. The water is conveyed to the Sipat STTP plant via two 29-km long subsurface pipelines. At present, dissension is growing between the State Government and the NTPC over the continued use of water from the Hasdeo Barrage.<sup>9</sup>



<sup>8</sup> ADB Report and Recommendation of the President to the Board of Directors, *NTPC Capacity Expansion Financing Facility*, June 2006.

<sup>9</sup> <http://www.nerve.in/news:253500137094>

In his letter to Prime Minister Manmohan Singh, the chief minister accused the NTPC for not taking any step to provide employment to 3,106 project affected families, including 691 families that lost more than an acre of land. ‘It’s most unfortunate that NTPC did not make any serious effort so far for offering jobs to displaced families that has created wide resentment among project oustees,’ Raman Singh wrote. Chhattisgarh can ensure water availability to Sipat project from Hasdeo Bango dam only for a temporary period of two-three years and the NTPC should use the time to lay pipeline to Mahanadi River from plant site that can easily feed water to the plant throughout the year,’ the chief minister has written.





| Land Acquired for Dipka Block Mine Expansion |              |                 |
|--|--------------|-----------------|
| PARTICULARS                                  | AREA         | % OF TOTAL AREA |
| Forest area                                  | 18600        | 38.12           |
| Irrigated Agricultural Land                  | 545          | 1.12            |
| Unirrigated Agricultural Land                | 20912        | 42.85           |
| Culturable waste land                        | 5084         | 10.42           |
| Area not available for cultivation           | 3658         | 7.50            |
| <b>Total area</b>                            | <b>48799</b> | <b>100</b>      |

Source: Pre-Feasibility Report

The project also assured 692 affected persons with employment but only 124 (18%) were actually provided with jobs. There are also contentions on the value of lands acquired by the project, as well as transparency and access to information issues.

### **Incorporating Climate Change Considerations in the Sipat STTP Project**

NTPC is not subject to greenhouse gas reduction targets under India's commitment to the Kyoto Protocol. It needs to integrate climate change in its corporate strategy not just by limiting emissions in accordance with World Bank/ADB standards but also by making plans for achieving emission reduction targets and undertaking measures beyond the company's boundaries to contribute to efforts towards India's transition to a low carbon economy.

It can join the ranks of companies in the world today who are making headway for the climate by accounting GHG emissions and keeping a GHG inventory,<sup>10</sup> which has been identified as an important step for companies to assess climate change-related risks and understand their impacts on climate. The reporting of this information helps policymakers in developing targeted climate change policies and monitoring progress across industries. For consumers, commercial partners and financial institutions, this information provides a basis

to understand the company's carbon footprint and its performance in managing climate change risks. A key step for reducing emissions requires developing emission reduction plans that include measures to reduce emissions – internally, externally or both – and embedding climate change considerations into corporate governance, from the board to managers and employees. In the absence of internationally agreed standards to determine methodologies and scope of information that will be reported for corporate accounting and reporting of GHG emissions, NTPC can consider standards such as the Greenhouse Gas Protocol.<sup>11</sup>



Photo courtesy of Environics Trust

<sup>10</sup> Read more from Céline Kauffmann and Cristina Tébar Less' *Transition to a Low-Carbon Economy: Public Goals and Corporate Practices*, OECD.

<sup>11</sup> The Greenhouse Gas Protocol is the de facto international standard for GHG accounting of GHG emissions at the corporate level, helping government and business leaders to understand, quantify, and manage greenhouse gas emissions. It provides the accounting framework for nearly every GHG standard and program in the world - from the International Standards Organization to The Climate Registry - as well as hundreds of GHG inventories prepared by individual companies. The GHG Protocol also offers developing countries an internationally accepted management tool to help their businesses compete in the global marketplace, and their governments make informed decisions about climate change.



## Recommendations

Mainstreaming climate change through EIA can be one recommendation to the Prime Minister's Council on Climate Change. The GHG inventory and GHG reduction plans can be integrated in environmental management plans.

NTPC can more actively engage with the Government of India to contribute to a low carbon economy and participate in initiatives elaborated in its National Action Plan on Climate Change (NAPCC) on power generation, renewable energy and energy efficiency.<sup>12</sup>

Actions in this regard include a mandate for government to retire inefficient coal-fired power plants and support research and development of IGCC and supercritical technologies, compel central and the state electricity regulatory commissions to purchase a certain percentage of grid-based power from renewable sources and require large energy consuming industries to undertake energy audits.

Steps can be taken to amend the National Environment Policy (NEP) of 2006, which is silent on the impact of climate change, by including emission regulations.

Steps need to be taken to review and address NTPC's compliance with social and environmental safeguards and address the gaps with affected families. Greater awareness of climate change is needed among all stakeholders in the cumulative impact area. Steps must be taken to 'acclimatize' pollution management and environmental protection and conservation measures, to include disaster risk reduction components.

Measures for India's transitioning to a low-carbon economy have been initiated in the NAPCC but needs more serious deliberation and implementation. ADB can help the country to significantly achieve this by ceasing all support for coal and channeling assistance to renewable energy production.

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<sup>12</sup> Actions in this regard include a mandate for government to retire inefficient coal-fired power plants and support research and development of IGCC and supercritical technologies, compel central and the state electricity regulatory commissions to purchase a certain percentage of grid-based power from renewable sources and require large energy consuming industries to undertake energy audits.

# The Visayas Base-Load Power Development Project

## “A Model for Greenfield Power Plants (Particularly Coal-Fired) in the Philippines”

*Studies and testimonies gathered by the Freedom from Debt Coalition (FDC) and its partners point out health and environmental risks glossed over by the ADB's Summary Environmental Impact Assessment (SEIA) while demystifying the use of 'clean technologies' that proponents hope would make the project a showcase for future coal-fired power plants in the country.*



\* The full version of the research by Aaron Pedrosa of Freedom from Debt Coalition, Cebu City, Philippines is available at <http://www.forum-adb.org>.



## Project Brief

**A**DB's power failure in the Philippines involves a \$120 million loan to the Korea Electric Power Company-Salcon Power Corporation (KSPC), for financing the construction, operation and maintenance of a 200 MW coal-fired power plant in the district of Colon, Naga City, Cebu Province. It is the latest addition to two existing 110 MW coal-fired plants owned by the National Power Corporation—built to provide base load power to the Visayas grid and thus charge up a region currently grappling with worsening power shortages.

With a \$100M loan from Korean Export-Import Bank<sup>1</sup> obtained by the KSPC in 2008, the ADB loan will construct a power plant utilizing circulating fluidized bed combustion (CFBC) technology—also dubbed as “cleaner coal” technology because the boilers used are said to generate very low nitrogen oxide and sulfur dioxide emissions. The plant will consist of two 100 MW units which will utilize coals from Indonesian and local suppliers. The loan will also construct support facilities and new transmission lines.

The project utilizes a new finance structure of a merchant power plant on a build–own–operate basis, characterized by the execution of power sales contracts with distribution utilities and electric cooperatives, instead of purchase power agreements with the

Philippine government. Under this concept, the generating company is responsible for the whole construction, operation, and maintenance of the plant, including fuel supply—without any Philippine government guarantees. Once completed, the Naga plant will supply power to eight electric cooperatives and a private investor-owned utility that have signed a total of 171.1 MW power sales contracts.

The 8.4 hectare-project area sits on the previous ash pond disposal area of the existing Naga Power Plant. It has easy access to transmission lines, seawater for cooling and industrial use and infrastructures (access road, water intake channel, and jetty trestle). The plant will be interconnected to the Visayas transmission grid through the New Naga Substation located less than a kilometer away.

Among a number of reasons, the ADB merited the project worthy of assistance<sup>2</sup> as it “supports sustainable growth in the Visayas region by increasing the availability of reliable and competitively priced power to help alleviate the current power supply shortage without additional fiscal burden on the Government.” The ADB also believes the project will “revitalize implementation of the Government’s reform agenda for the power subsector... increasing competition, and efficiency through private sector investment in the sector.” Utilizing what it claims is a more environment-friendly technology, the ADB deems that the power plant “will be a model in the application of cleaner technologies to coal-fired power plants in the Philippines,” besides being the least-cost option “with adequate mitigation equipment and measures incorporated in the project design.”

As of 30 June 2010, 91.21% of construction milestones were completed.<sup>3</sup> Target for commercial operation is February 2011 for the first 100 MW unit and May 2011 for the second 100 MW unit.

## Scope of the EIA

On 5 December 2005, the Department of Environment and Natural Resources (DENR) gave the environmental compliance certificate for the Visayas Base-Load Power Development Project based on KSPC’s environmental



**THE VIEW.** The ADB-funded 200-MW coal power plant in Cebu, Philippines.

*Photo taken by Lala Cantillo/NGO Forum on ADB.*

<sup>1</sup> The Visayas Base Load Development Project is the first collaboration between ADB and Korean Export-Import Bank. The two institutions signed a memorandum of understanding in 2008 under the Asian Infrastructure Financing Initiative.

<sup>2</sup> ADB Report and Recommendation of the President to the Board of Directors, July 2009.

<sup>3</sup> KEPCO SPC Power Corporation, ADB Environmental Monitoring Report, July 2010.



impact statement (EIS). A public hearing was held earlier on 6 August 2005 as part of the EIS. After nearly four years, the ADB released the project's Summary Environmental Impact Assessment (SEIA)<sup>4</sup> to the public in March 2009. The ADB eventually approved the proposed loan for the project a few months later.

The SEIA emphasized that “no significant environmental impacts could be expected” from the project, as the power that would fuel the Visayas grid would utilize the latest ‘clean coal’ technology, which reduces the production of unwanted air pollutants. The project also outlined several measures to mitigate any adverse social and environmental impacts. These include:

- (i) Construction of a desalination plant, to ensure that the plant's freshwater requirements would not compete with the local community's water table;
- (ii) Collection and transportation of ash produced during operations to a nearby cement manufacturing plant as raw material. In emergencies, ash will be transferred from the silo in a humidified form and stored in the emergency ash pond on-site, lined with high density polyethylene to ensure no ground seepage of the wet ash;
- (iii) Resettlement of informal dwellers utilizing the project area, in coordination with the local government and the NPC;
- (iv) Increased employment opportunities especially during the construction stage which will require about 500–1,000 workers;
- (v) Installation of anti-pollution technology and devices to prevent air pollutants from going into nearby communities;
- (vi) KSPC will monitor the health of local communities, contribute to the improvement of local health services and facilities, and conduct periodic medical missions that will distribute free medicines; and



**A DENT ON THE LANDSCAPE.** The landscape has been compromised by the presence of the coal power plant.  
Photo taken by Lala Cantillo/NGO Forum on ADB

- (vii) Implementation of a social development plan, as well as an environment management plan, including monitoring of air emission, water quality, land use, ecological resources, and social aspects.

Studies conducted by the Freedom from Debt Coalition (FDC) and its partners, however, heavily criticized KSPC and ADB's appraisal for “double talking,” as protesting groups noted that the SEIA report “largely glossed over health and environmental risks posed by the coal-fired plant” and scored the “lack of baseline data of any initial studies undertaken.”<sup>5</sup> Furthermore, the group disclosed disturbing practices observed, some violating the Bank's safeguard policies and handling of the EIA.

### ***Consultation or Manipulation?***

The SEIA claims “the community and various stakeholders were consulted in various venues for participation in the environmental impact assessment study, through informal interviews in the form of community meetings and/or focus group discussions and public consultations. Residents were given the

<sup>4</sup> The SEIA report provided information it was expected to give on (a) Project Description, Design and Construction, detailing project facilities that will be constructed, (b) Descriptions of the Physical, Biological, and Socio-Cultural Environment, (c) Alternatives considered, (d) Anticipated Environmental Impacts and Mitigation Measures to be employed at various phases of project implementation, (e) Economic Assessment, (f) Environmental Management Plan and (g) Public Consultation and Disclosure report.

<sup>5</sup> Violeta P. Corral, *KEPCO-Salcon's 200MW coal-fired power plant (Naga, Cebu)*, Public Services International Research Unit, September 2009 at [www.psir.org](http://www.psir.org)



opportunity to discuss the possible environmental and social impacts of the proposed Project.” However, FDC cited several circumstances that placed the project’s social acceptability under question.

The group cited results of a perception survey covering 122 residents in four barangays within the project area that revealed residents were not at all aware about the conduct of the EIA. Majority or 45 % of respondents also claimed not being asked by the local government unit if they were in favor of the new plant’s construction. Some 41% also disclosed that they did not know of discussions conducted in their barangay on the KSPC power plant. Respondents also revealed that Barangay Captains mobilized ten residents per barangay to express support for the project in the 6 August 2005 public hearing conducted about the KSPC power plant, prompting respondents to raise questions on Nagahanons’ representation to the said dialogue.

Another NGO, the Cebu Alliance for Renewable Energy (CARE)<sup>6</sup> found that the KSPC contracted the services of a PR firm that succeeded in tilting the balance of media coverage in KSPC’s favor. A three-month community relations campaign in the surrounding communities of the project mobilized thousands of residents who expressed support for the construction of the coal-fired plants during the municipal ECC and Cebu Provincial Board hearings.

The FDC also deplored the ADB’s non-disclosure of important documents during the early stages of the project, such as the chemical analysis report and recommendations by KEPCO consultants, among others.

### ***Dismissing the Dangers to Health and Environment***

The SEIA concedes a host of the project’s adverse environmental and social impacts inherent with the use of coal, but it dismisses the serious risks posed to life and ecology with mitigating measures that the KSPC vows to undertake during the plant’s construction and operation. The mitigating measures are contained in separate environment and social management plans. It also outlines a monitoring program and annual



Photo taken by Lala Cantillo/NGO Forum on ADB

environmental audit. Financial resources for carrying out these social and environment plans were readily committed. The SEIA did not provide values for the environmental costs of power plant activities that are “difficult to quantify”—for water supply, discharge of effluent and air pollution related to the disposal of ash; use of seawater for desalination; discharge of heated water and wastewater to the sea; and discharge of flue gas to the atmosphere—which expectedly are the most costly consequences of having a coal-fired plant.

The matter of coal ash disposal proved to be among the top concerns. The SEIA notes that KSPC commits to collect and transport the ash produced during the plant’s operations to a nearby cement manufacturing plant as raw material. But in July 2009, KSPC’s callous disregard for the environment and health of Nagahanons became evident when it signed a MOA with the Cebu Provincial Government allowing the conversion of a 25-hectare beachfront property near the plant site into a coal ash dumpsite for a term of at least 25 years, subject to extension.<sup>7</sup> The deal would earn for the province an estimated potential revenue of P48 million (\$1million) or \$1 for each ton of ash dumped by KSPC—“a token amount compared to the overall degradation to be suffered by communities living near the power plants and the coal ash dump site area.<sup>8</sup>” Environmental lawyers under the Global Legal Action on Climate Change (GLACC) were quick

<sup>6</sup> *ibid.*

<sup>7</sup> On October 2009, ADB was reported to be agreeable to proposals to review and monitor KSPC’s Ash Disposal Management Plan, including ash content testing, collection, transportation, and final placement to ensure the project’s ash disposal complies with ADB’s environmental safeguards requirements.

<sup>8</sup> Freedom from Debt Coalition media release, *FDC opposes Impending ADB Loan Approval for Coal Power Plants*, 31 July 2009.



to expose that 80% of the property in question was submerged timberland and converting it as a coal ash dumpsite is “ecologically destructive, patently illegal and preposterous.”<sup>9</sup>

Experts pointed out that the ‘clean coal’ technology that KSPC and the ADB claims would reduce air pollutants, produces four times the amount of very toxic waste containing poisonous and radioactive substances like mercury, arsenic, lead, boron, cadmium and cobalt. The SEIA admits that the plant will generate ash at a rate of about 250 tons/day. However, the study notes that this is still a modest estimate. Former National Power Corporation employee Engr. Vic Obando<sup>10</sup> gave a computation on the amount of waste that would be produced by the KSPC plant, which apparently can reach as much as a staggering 52.4 tons of coal ash per hour. Having been no stranger to coal ash dumped by the existing Naga Power Plant, a survey respondent attested that “the sand in some areas of the beach is so hot it burns the feet.” Residents expressed fears that the new KSPC plant will result in indiscriminate coal ash dumping in the city.

The FDC study also notes that the SEIA mitigation plan failed to incorporate a targeted health program that would monitor health risks related to ash coal residues. CARE added that since 2005, it has been insisting Naga residents to have their blood and hair samples examined for possible toxicity. Survey respondents have mentioned that skin and respiratory illness have proliferated since the Naga power plants started operating in their area, and expressed fears that the construction of another coal plant may only make things worse. A May 2009 report by the Environmental Integrity Project and Earth Justice added that “living near ash ponds increases the risk of damage to the liver, kidney, lungs and other organs as a result of being exposed to toxic metals at concentrations far above levels that are considered safe.”

Engr. Obando also cited that the SEIA made “very minimal mention, if any, of impacts by the coal-fired power plant on coastal communities, fisheries and marine ecosystems.” He explained that the plant would utilize a once-through seawater cooling system that would involve sucking in seawater at a temperature of 28°C and discharging the processed water to the sea at a higher temperature between 45°C to 60°C. This variance in temperature “will make the coastal ecosystem vulnerable and may lead to the decimation of marine life.” Local residents claimed that marine life has dwindled over the years since the operation of the existing Naga plant.<sup>11</sup> They fear that the condition will further aggravate once another coal plant begins operating.

Residents also expect that the new plant will worsen the pollution problem. One respondent revealed that the Naga power plant located in Barangay Poblacion emits dark smoke during nighttime, which they believe is a strategy of NPC to avoid detecting the bulk of waste that harms the air. When this happens, they claim that “the dust in the air is so thick, it feels like sand.”



**FENCED. Marked boundaries enclose the area.**

*Photo taken by Romil Hernandez/NGO Forum on ADB*

<sup>9</sup> Victoria P. Corral, *KEPCO-Salcon's 200MW coal-fired power plant (Naga, Cebu)*, Public Services International Research Unit, September 2009 at [www.psir.org](http://www.psir.org)

<sup>10</sup> Mr. Obando was a guest expert in a Roundtable discussion on the KPSC power plant, which was organized by FDC Cebu in 2009, as cited by Pedrosa and Hernandez.

<sup>11</sup> FDC perception survey respondents expect the new coal-fired power plant, just like the previously built power plant nearby, to destroy fish and other marine life forms. Fishermen among them recalled the big difference with their catch (and income) back when Naga has no power plants. “Today, our livelihood in Naga faces a bleak future. In the past, we have loads of fish caught but now, we often go home with our boats empty. This is because the plants discharge their hot solid wastes directly to the seas. No fish could survive in a warm polluted sea.”



### ***Development for the Few***

The SEIA claims that the new power plant will increase employment opportunities in Naga and nearby areas. However, residents are skeptical that the new plant can indeed help generate sustainable jobs and lead to a better quality of life for Nagahanons.

An FDC survey respondent expects employment opportunities only during the period of construction. “When the plant is built, KSPC will surely hire experts from Luzon and Korea. Jobs generated by the project will not be sustainable for local residents.” Another respondent doubts that the power plant will contribute to the development of the city. “Our lives never improved, contrary to the promises of industry giants here in Naga. When the first power plant came, life in the city became worse, as our environment, health and livelihood deteriorated.”

### ***Difficulties in Recognizing Cumulative Impacts***

The SEIA’s cumulative impact assessment from the operation of the KSPC plant and other existing sources of pollutants—such as the Naga power plant and the APO Cement (CEMEX)—found that “the predicted emissions for the project have considered the contributions from these plants and levels to remain within national limits.” The SEIA added that “air and water qualities are not likely to be significantly worse than current levels if the existing Naga power plant and the proposed KSPC power plant operate at the same time.

However, in the end, the report again admits to “difficulties” in predicting potential cumulative impacts on the project area, and again merely commits KSPC to the corporate social responsibility policy. This only means that KSPC will ensure the development of a social development plan and the allocation of an annual budget of P240,000 “for interventions and donations in health, sanitation, nutrition, and education.” The recipients of these community programs are residents only of Barangay Colon where the plant is being constructed, including the relocated families.

The SEIA conveniently omits the fact that the actual impact area of the project transcends beyond the community where the plant is located. An FDC survey



**ALL DRIED UP.**

*Photo taken by Romil Hernandez/NGO Forum on ADB*

respondent confirms, “Only those who are near the power plants are given medical privileges. Residents of neighboring barangays who are similarly affected by the harmful pollution of the power plant receive no compensation at all.”

### ***Climate Change Considerations in the EIA***

The SEIA does not directly mention climate change considerations in the project design but it does recognize that operating a coal-fired plant such as the Visayas Base-Load Development Project “would emit sulfur oxide, nitrogen oxide, suspended particulate matter (SPM) and carbon dioxide—all major contributors to greenhouse gases.” Knowing this, the project proponents justify the preference for using coal on grounds that the ‘clean coal’ technology would be used. Moreover, the availability and cost-efficiency of coal was found superior compared to other fuel sources.

### ***The Myth of ‘Clean Coal’***

The SEIA makes much of the circulating fluidized bed combustion (CFBC) or “clean coal” technology, and describes how it reduces emission of these pollutants: “The CFBC technology will “use calcium carbonate to trap and solidify the sulfur and its derivatives present in the coal. Furthermore, the relatively low burning temperature in the furnace will lessen the derivatives of nitrogen to an acceptable level. An electrostatic precipitator will be installed to eradicate the suspended





particles from going into nearby communities. In addition, the storage area for coal will be enclosed by a roofed structure to prevent the carbon ash from going into nearby communities.”

Despite these, the FDC study points out the glaring fact that the CFBC technology does not reduce carbon dioxide emissions—the leading contributor to climate change. By the SEIA’s own estimates, burning 729,500 metric ton/year of Indonesian coal would generate about 1,006,148 tons of carbon dioxide/year. The project’s argument that “all emissions are guaranteed to be below Philippine standards and World Bank guidelines for all pollutants<sup>12</sup>” cannot justify that these emissions all end up in the atmosphere as added fuel to the problem of global warming.

### ***False Economy over Strategic Value***

The SEIA justifies the preference for coal because other fuel sources were deemed either not easily or sufficiently available (hydro, biomass, geothermal, natural gas) or relatively expensive (solar, wind, oil).<sup>13</sup>

While there are findings in the SEIA that acknowledge the significance of geothermal energy for power generation in the Visayas,<sup>14</sup> the project proponents still opted for coal rather than investing in its continued development after determining that “coal projects are a necessary supplement to provide adequate [energy]supply.”<sup>15</sup>

The FDC study, however, notes that the coal power proponents did not look at the strategic value of investing in renewable energy sources, and turned a blind eye on the socio-economic and environmental costs of using coal. Dr. Glen Martin Green, a professor at the University of San Carlos,<sup>16</sup> adds that coal technology only appears to be cheaper because costs are externalized.<sup>17</sup> “While coal might be comparatively cheap in the marketplace, in reality, the cost of coal is far too high because it is the communities that live near and around these (coal-fired power) plants that ultimately suffer the negative impacts from the use of coal.”

<sup>12</sup> According to ADB (2009), the Philippines nearly doubled its total carbon dioxide emissions to 80.5 million tons in 2004 from 43.9 million tons in 1991. However, the Philippines’ share of the total world emission of carbon dioxide remains small. The Philippines accounts for only 0.3% of global carbon dioxide emissions although it comprised 1.3% of the world’s population in 2004.

<sup>13</sup> “Natural gas, which generates minimal carbon dioxide, particulate matter, and sulfur dioxide compared with coal, has accessibility issues due to the absence of piping systems from the supply source. Geothermal and hydroelectric power plants are location-specific and there is no known source in Cebu. A wind power plant, utilizing renewable energy, is also location-specific and needs a large area for a wind turbine, which is not available in Cebu. Nuclear plants that do not produce smoke or any gas emissions would encounter difficulties in achieving social acceptance besides the problem of radioactive waste disposal. “A coal-fired power plant was deemed the most appropriate plant to be constructed in Cebu, with accessibility to coal suppliers (through sea ports), availability of coal supplies (both imported and locally), low capital cost, and availability of clean coal technology.”

<sup>14</sup> The SEIA reports: “The Philippines is the world’s second largest user of geothermal energy for power generation with 1,958 MW accounting for 12% of the country’s total installed capacity. The continued development of geothermal energy as an economically competitive and environment-friendly resource remains a Government priority. Almost 50% of the Philippines total geothermal capacity is located in the Visayas (723 MW in Leyte and 242 MW in Negros). Total geothermal potential in the Visayas is estimated at 1,619 MW, constituting 42% of the country’s total geothermal reserves. However, existing geothermal plants are only operating at a fraction of their rated capacities and new geothermal capacity is expected to come on-line very slowly relative to demand growth. Even accounting for the new geothermal capacity expected, the Department of Energy has identified a need for additional base-load generation in Cebu.”

<sup>15</sup> The SEIA reports: “This outcome was confirmed in the model constructed by the lenders’ market consultant for project supply and demand. The model assumes the following additions to geothermal capacity: PNOC-EDC’s 20 MW Nasulo Geothermal Project in Negros in 2010, 40 MW Dauin Geothermal Project in Negros in 2012, and 100 MW Cabalian Geothermal Project in Leyte in 2015. The model also assumes additional wells are drilled to offset the natural decline in performance of existing wells, so the capacity factor of geothermal plants remains at 60%–80%.”

<sup>16</sup> Another guest expert in the Roundtable discussion on the KPSC power plant, which was organized by FDC Cebu in 2009, as cited by Pedrosa and Hernandez.

<sup>17</sup> A 2003 External Cost Study conducted by the European Commission defines external costs as arising when the social or economic activities of, say, a power station, have an impact on a set of people and when that impact is not fully accounted, or compensated for, by the power plant. Thus, a power station that generates sulfur dioxide or mercury emissions, causing damage to human health, imposes an external cost. Environmental costs are thus “externalized” because, although they are real costs to members of society, the owner of the power station is not taking them into account when making decisions related to his economic activities. This study further identified coal-fired power plants as having the highest external cost. Wind power registered the lowest external cost among all energy sources.



FDC also cites a study by the European Commission that identifies external costs of having coal-fired power plants:

- (i) Climate change impacts;
- (ii) Human mortality, i.e., reduction in life expectancy, cancers;
- (iii) Human morbidity, i.e., respiratory hospital admissions, restricted activity days, congestive heart failure;
- (iv) Impacts on building materials, i.e., aging of galvanized steel, paint;
- (v) Impacts on crops, i.e., changes in yield caused by nitrogen oxide, sulfur dioxide, trioxide and acid deposition;
- (vi) Amenity losses due to noise or spoliation of aesthetics; and
- (vii) Impacts of acid and nitrogen deposition on ecosystems.



Photo taken by Romil Hernandez/NGO Forum on ADB

Dr. Green also argued that since the supply of coal is finite and is already dwindling due to worldwide consumption, “supply is expected to peak by 2030, resulting in a supply waning into low-grade coal.” Thus, having the coal project will definitely be a losing venture for the Philippines in the long run, compared to the adoption of renewable energy such as wind, solar and hydro.

Greenpeace, in a 2005 publication, identifies the Philippines’ rich new renewable energy (NRE) resources that the FDC study says government ought to tap. The National Renewable Energy Laboratory of

the U.S reportedly pegs the Philippines’ wind energy resource potential at 76,000 MW that can supply over seven times the current power demand of the country. Experts estimate that, with the right policy support from the government, commercial viability of wind power in the country can reach anywhere from 10 to 20% utilization of potential within a 10-year plan period. Solar energy is likewise abundant, and the Philippines possesses one of the highest efficiency ratings in the world. In fact, energy from sunlight that falls on a land area half the size of Quezon City can provide the power needs of the entire country. Meanwhile, the combined commercially viable biomass potential within a ten-year planning period from bagasse, rice and coconut residue is over 2,300 MW, while mini-hydropower has a total resource potential of 1,132 MW. Sadly, energy production in the Philippines relies heavily on coal, diesel and natural gas, which comprise 64.7% of the power generation mix. Combined renewable sources such as hydro, geothermal, wind and solar power is only 35.27% of the mix, or a 29.43% difference.<sup>18</sup>

The study notes that “the volatile situation on world fossil fuel prices, the rampaging and worsening impacts of climate change and the increasing toxic risks faced by communities hosting coal plants warrants a serious, strategic reconsideration of the energy pathway so far chosen by the country. New renewable energy (NRE) alternatives can be harnessed by the country to protect the environment, to provide jobs and to strengthen the country’s energy independence.”

## Lessons and Recommendations

In its Strategy 2020, the ADB embraces a commitment to “help developing countries shift to low-carbon growth and protect those most vulnerable against the expected impacts of climate change.” As can be gleaned from the FDC study, this pledge was hardly evident in the Visayas Base-Load Power Development Project, which proves to be another case validating the Bank’s horrible track record in funding the private sector’s past and ongoing projects that contribute to climate change. The KSPC’s EIA promotes a myth that coal can be ‘clean’ and largely ignores the external costs that come with establishing a coal-fired power plant. In various instances, safeguard measures were even violated. The foregoing exercise also gives rise to concerns not only on the necessity of mainstreaming climate change in

<sup>18</sup> FDC media release, *ADB Privatization Policy Aggravates Climate Crisis in the Philippines*, 16 June 2009.



**TRASH BIN.** Coal ash was indiscriminately dumped beside a river.

*Photo taken by Romil Hernandez/NGO Forum on ADB*

the EIA but also rethinking the propriety of current strategies that the ADB observes in its work with the energy sector.

For one, in helping countries to meet their energy needs with climate change considerations in mind, the Bank should cease any support for coal, recognize the true costs that come from using it as a fuel source and account/valuate externalities as a way of discouraging investments.

Second, ADB should recognize the increasing viability and strategic advantages of new renewable energy (NRE) sources such as solar, wind, geothermal, small hydropower and waste biomass. This should not include large hydropower, monoculture crops or plantations that involve deforestation, which directly or indirectly release greenhouse gas emissions, reduce biodiversity and destroy natural ecosystems. The Bank

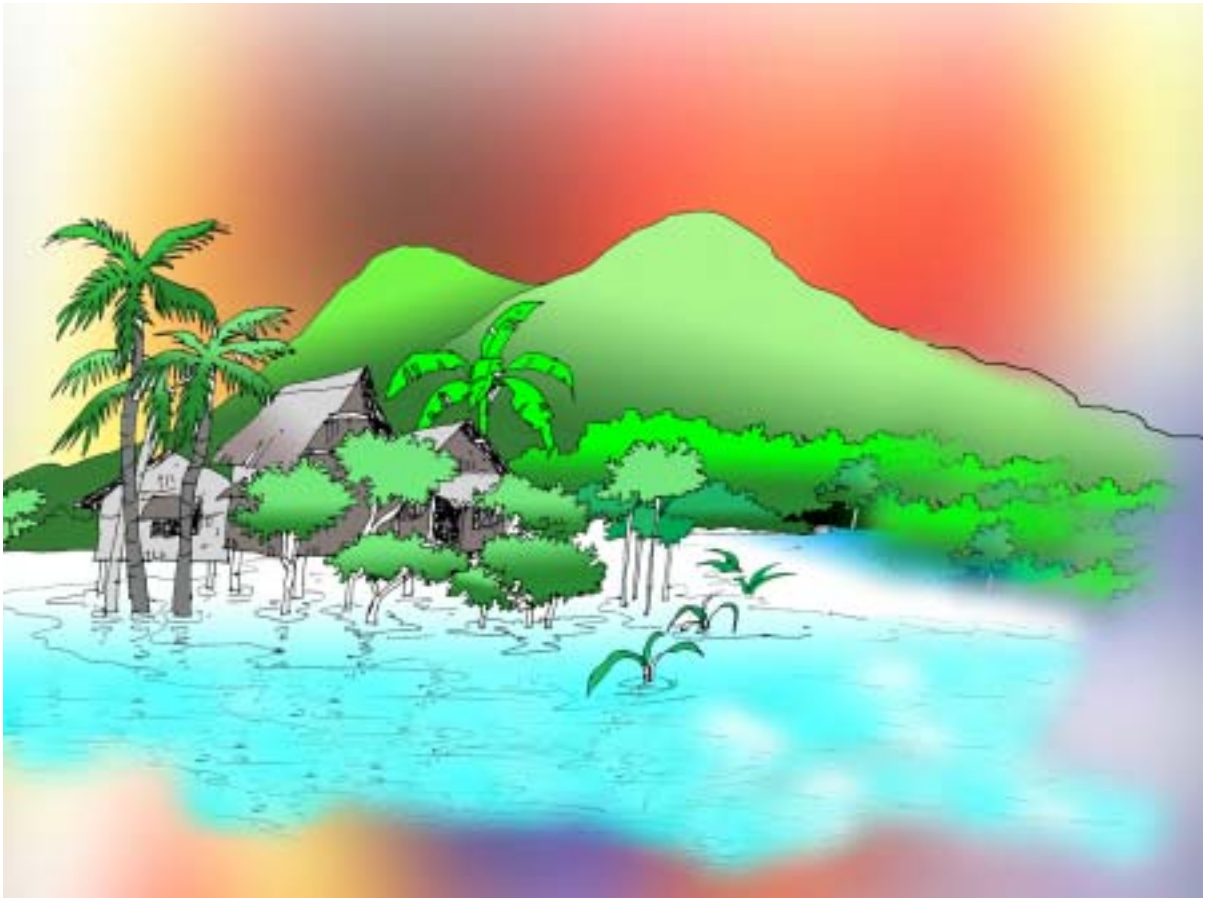
should also intensify its support for renewable energy production in a manner that facilitates changes in the current energy status quo.

Third, ADB should review its policy on the private sector's participation in energy production and instead finance and encourage rural electrification programs that have rural populations as target beneficiaries. It should be recalled that the ADB initiated and funded the Power Sector Reform Program (PSRP) in the country, taking away from the State the responsibility of generating, transmitting, and distributing power. ADB also lobbied for the implementation of the Electric Power Industry Reform Act (EPIRA). There is thus the heavy reliance on private power which produces energy even from cheap but dirty sources such as coal. Since these policies were put in place, non-renewable and coal-fired power projects proliferated—these include at least four new coal-fired power plants targeted in the Visayas region, the expansion of the two biggest coal-fired power plants in the country located at Pagbilao, Quezon, and Masinloc, Zambales.

The Philippines, as a signatory to the United Nations Framework Convention on Climate Change (UNFCCC), is committed to help reduce greenhouse gas emissions; and as a country highly vulnerable to the disastrous impacts of climate change, should be given prescriptions that encourage the adoption of national strategies that reduce the use of fossil fuels and strengthen its people's capacity to adapt or be resilient to the impacts of climate change. Specifically for the power industry, this means departing from the heavy reliance on coal, diesel and other fossil fuels, reducing pollution and promoting the sustainable management of various ecosystems. As a development bank, the ADB can and should be a catalyst for making this shift into reality.

# The Southwest Area Integrated Water Resources Planning and Management Project

**“The people are very unhappy at the present situation and want solutions to their problems by rehabilitation schemes implementation...”**



\* The full version of the research by Md Sarwar Hosain and Kh. Azizulh Haque Moni of Ulashi Sreejony Sangha (USS), Jessore, Bangladesh is available at <http://www.forum-adb.org>.



**T**he Ulashi Sreejony Sangha believes that the EIA process for this water resource management project in Bangladesh could be enhanced by tailoring adaptation assistance to local needs in order to address pressing local vulnerabilities on the basis of participatory climate change impact assessment methodologies.

Integrated water resources management is highly relevant in adapting to climate change. The conservation of catchment areas, improvement of water management system (esp. irrigation), and flood control are types of anticipatory adaptation.<sup>1</sup> But this is not apparent in the case of the ADB-financed Southwest Area Integrated Water Resources Planning and Management Project (SWAIWRPMP) in the flood-prone country of Bangladesh.

## Project Description

On 23 November 2005, the application of Bangladesh for a \$20-million loan (to partly finance the Southwest Area Integrated Water Resources Planning and Management Project) got a nod from ADB. As reported in the Summary EIA (July 2005): “The Project aims to rehabilitate and upgrade the existing flood control and drainage/irrigation (FCD/I) schemes in the southwest region of Bangladesh, so as to achieve their maximum development potentials in terms of agricultural and fishery production and incomes of beneficiaries in a sustainable manner.” The Project—which will benefit about 0.8 million rural population, the majority of whom are poor—covers about 100,000 hectares (ha), particularly the Chenchuri Beel FCD/I Scheme and the Narail FCD/I Scheme.<sup>2</sup>

The major water management problems that this project will try to address include the following: (i) low reliability of flood protection because of degraded flood embankments, river erosion along the lower Nabaganga River, and leakage from regulators; (ii) overdrainage in higher lands; (iii) congested drainage in low-lying areas due to siltation in the drainage canals; (iv) shortage of irrigation water and occasional

salinity intrusion from surrounding rivers in the dry season due to leakage through regulators or lack of them.

The two subprojects entail the following:

- (i) Preparing integrated water management plans (IWMPs);
- (ii) Delivering improved water management infrastructure and support services for agriculture and fishery development and piloting mitigation of arsenic contamination; and
- (iii) Strengthening institutions to undertake sustainable operation and maintenance of these facilities.

## Scope of the EIA

According to the Halcrow Group Ltd., UK (the firm that prepared the EIA), the EIA was made in accordance with the *Environmental Assessment Guidelines* of the Asian Development Bank (ADB, 2003) and ADB’s *Guidelines for Selected Agricultural and Natural Resources Development Projects* (1991). It also took into consideration the guidelines prepared by the Government of Bangladesh: *Guidelines for Environmental Impact Assessment (EIA)* prepared by FPCO (1992), along with the *Manual for Environmental Impact Assessment* (ISPAN 1995) and the *Guidelines for Environmental Assessment of Flood Control, Drainage and Irrigation Projects* (WARPO, 2001). Following the “List of Contents” prescribed by ADB’s *Environmental Assessment Guidelines*, the EIA report provided a description of the Project; the environmental setting covering the physical, biological and socio-economic environments; the project alternatives; anticipated environmental impacts and mitigation measures; economic assessment; the institutional requirements, the environmental monitoring program and the Environmental Management Plan; and overview of the involvement of the public in the assessment.

<sup>1</sup> See, for example, Cap-Net, *IWRM as a Tool for Adaptation to Climate Change: Training Manual and Facilitator’s Guide*, July 2009. See also, GWP, *Climate Change Adaptation and Integrated Water Resources Management – An Overview*, Technical Committee Policy Brief 5, Global Water Partnership, 2007 and Roel Slootweg, *Integrated Water Resources Management and Strategic Environmental Assessment Joining Forces for Climate Proofing*, Perspectives on Water and Climate Change Adaptation No. 16, Co-operative Programme on Water and Climate (CPWC) and the Netherlands Commission for Environmental Assessment (MER), 2009.

<sup>2</sup> The Chenchuri Beel subproject provides flood protection for a total of 25,560 ha (net cultivated area of 17,900 ha) through 86 kilometers (km) of embankments. Meanwhile, the Narail subproject comprises two hydrological systems divided by the Gobra khal in the middle of the subproject area. It provides flood protection for 31,600 ha (net cultivated area of 23,440 ha) with 33 km of flood embankment along the right bank of the Chitra River in the southern system.



The need for the two subprojects were based on several appraisals<sup>3</sup> of these flood control and drainage infrastructure projects implemented during the early 1980s, whose findings indicated that “original project objectives (i.e., controlled flooding drainage and irrigation promoting extensive cultivation) were not met” and that facilities constructed were “not functioning well.” The studies also concluded that there was a need for additional improvements in the current drainage systems that would require rehabilitation and new construction of facilities in order to enhance water utilization for agriculture and fisheries.

In general, the project EIA found minimal adverse environmental and social impacts which mitigation measures can easily address:

The EIA concluded that the successful implementation of the project “will serve as a model to demonstrate the process of achieving substantial under-achieved development potentials of existing flood control, drainage, and irrigation systems while sustaining their benefits through effective stakeholder participation.”

### Climate Risk Oversight

The project area consists of several beels (pond or wetland) and is surrounded by two big rivers—the Chitra and Nabaganga. Water availability determines the course of agriculture, fishery and other sources of livelihood. The effects of climate change, as well as the morphological changes, are severe in the project

| Some Anticipated Adverse Impacts      |   |
|---------------------------------------|---|
| <b>Physical environment</b>           | <ul style="list-style-type: none"> <li>• Dust, noise and air pollution</li> <li>• Possible damage to local vegetation and topsoil</li> <li>• Degraded soil quality due to improper use of fertilizers and pesticides</li> <li>• Depletion of organic material and nutrient content in the soil</li> <li>• Possible increased salinity</li> <li>• Siltation may occur and hamper the functioning of structures</li> <li>• Erosion is already taking place and further erosion attacks may occur in the future</li> <li>• There may be some water pollution from the construction site</li> </ul>   |
| <b>Biological environment</b>         | <ul style="list-style-type: none"> <li>• Minor to medium disturbance to the aquatic environment, with detrimental effect on capture fisheries</li> <li>• Moderate, overall negative impact on fish habitats and fish migration</li> </ul>   |
| <b>Human and economic development</b> | <ul style="list-style-type: none"> <li>• A few enterprises will have to be relocated to make land available for new embankments and khals.</li> <li>• The two subprojects together will involve acquisition of 56.4 ha of land for construction of project infrastructures.</li> <li>• This will affect 546 households, out of which 149 would require relocation due to acquisition of their homesteads.</li> <li>• 132 residential/commercial structures will be affected.</li> <li>• Reduction in capture fisheries is considered to have a medium negative impact.</li> <li>• The implementation of arsenic mitigation will create minor disturbances.</li> </ul> |
| <b>Quality of life values</b>         | <ul style="list-style-type: none"> <li>• There is a risk that the opportunities for improved water management is captured by a small number of interested groups and operating facilities for the sake of their own benefits alone, affecting the livelihoods of the excluded stakeholders.</li> </ul>  |

Source: ADB, 2005

<sup>3</sup> Environmental Impact Assessment (Chenchuri Beel and Narail Subproject) prepared by Halcrow Group Ltd., UK for the Asian Development Bank, June 2005.



**SHRIMP CULTIVATION IN THE BEEL AREA.** According to the community, the full implementation of the project could accelerate the cultivation of shrimp as it has been experienced in Khulna-Jessore Drainage Rehabilitation Project (KJDRP).

*Photo taken by Md. Sarwar Hossain/USS Jessore Bangladesh.*

area, as can be gleaned from climate change evidence and impact assessment acquired through community surveys, focus group discussions and case studies conducted in several Narail subproject villages.<sup>4</sup> A review of the National Adaptation Programme of Action (NAPA) and other studies also points to this fact. However, the subprojects offer the usual structural solutions designed for complementing high external input agriculture and aquaculture development that studies prove may be highly inappropriate for the project area, especially as it has been established as one of the most drought-prone areas in Bangladesh.

The problem matrix prepared by the communities suggests that climatic factors such as rainfall, erratic temperature, drought, salinity, and river erosion are affecting livelihoods. The causal loop diagrams, problem matrix, seasonal calendar and case studies developed by the communities suggest that climate change might have triggered the changes in livelihood patterns in the region through the influence of the hydrometeorological events. For instance, the chart 'Trends of Livelihood' constructed by the communities pointed out that agriculture and direct nature-based sources of livelihoods are declining over time while new kinds of jobs, most of which were absent in the past, like "stationary shop" and "day labor" are increasing. This indicates that natural productivity is falling sharply, responding to the environmental changes that are occurring in the region.

Erratic rainfall, drought and the extended summer, and salinity have increased the production costs. Crops production now is heavily dependent on foreign seeds, fertilizers and "artificial" water sources. There may be some pockets of improvements in productivity but, generally, sources of livelihood are degrading and climate change, whether directly or indirectly, has induced more poverty.

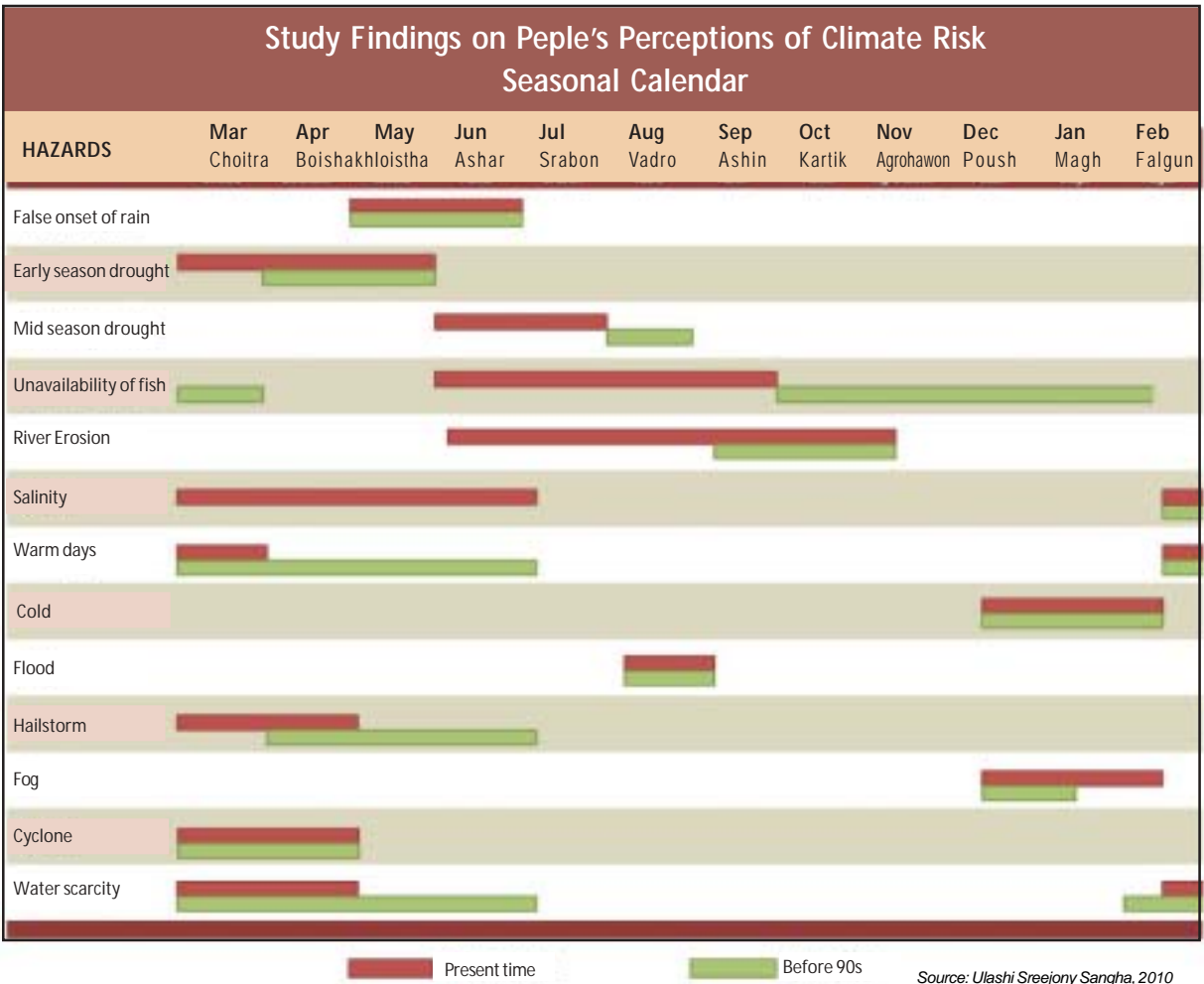
The seasonal calendar at the next page reveals that rising temperatures, more than any other risk, is the most substantial hazard currently affecting subproject communities. Temperature has been observed to rise during all seasons, but now especially beginning March, and even during the winter season. Early season and mid-season drought comes as consequences of rising temperature. Before the 1990s, early to mid-season drought occurred from March to May and August. At present, rising temperatures have extended the periods of drought from March to August. Salinity, which is a rare occurrence during the 90s, is now felt for extensive periods, and is also very much correlated with rising temperatures and drought. Rising temperatures also emerged as the topmost concern from the other tools used to determine community perception of climate risks, such as the problem matrix and causal loop. Such changes have spelled disaster for agriculture and fish production.



**PROTECTING NATURAL WETLANDS.** Infrastructure projects could alter this type of natural wetland.

*Photo taken by Md. Sarwar Hossain/USS Jessore Bangladesh.*

<sup>4</sup> These are in areas where the ADB and Bangladesh Water Development Board conducted a rapid project appraisal in 2008, specifically in the villages of Noagram, Kolamon Khali, Sulto gram, Mulia, Singa and Chchuri.



The seasonal calendar of livelihood activities, livelihood trends and adaptation practices shown at the next page reveal that crop cultivation of boro and aman has not changed but farmers reported that their production costs rose due to their utilization of water-dependent foreign seeds, fertilizers and pesticides, while crop yield was reduced by almost 50 percent as a result of the severity of drought and salinity. Fishing activities are now substantially reduced compared to the 90s, as fishermen revealed that salinity and water scarcity affected fish breeding grounds, damaging fish eggs. People are also leaving their traditional occupation to engage in other forms of livelihood. Overall, the trends show less dependence on paddy farming, fishing, and cattle raising and more shifts to day labor, as people engage in small business, stationary shops, rickshaw pulling and other alternative means of living.



**DYING BIODIVERSITY.** The adverse effect of rising salinity on biodiversity.

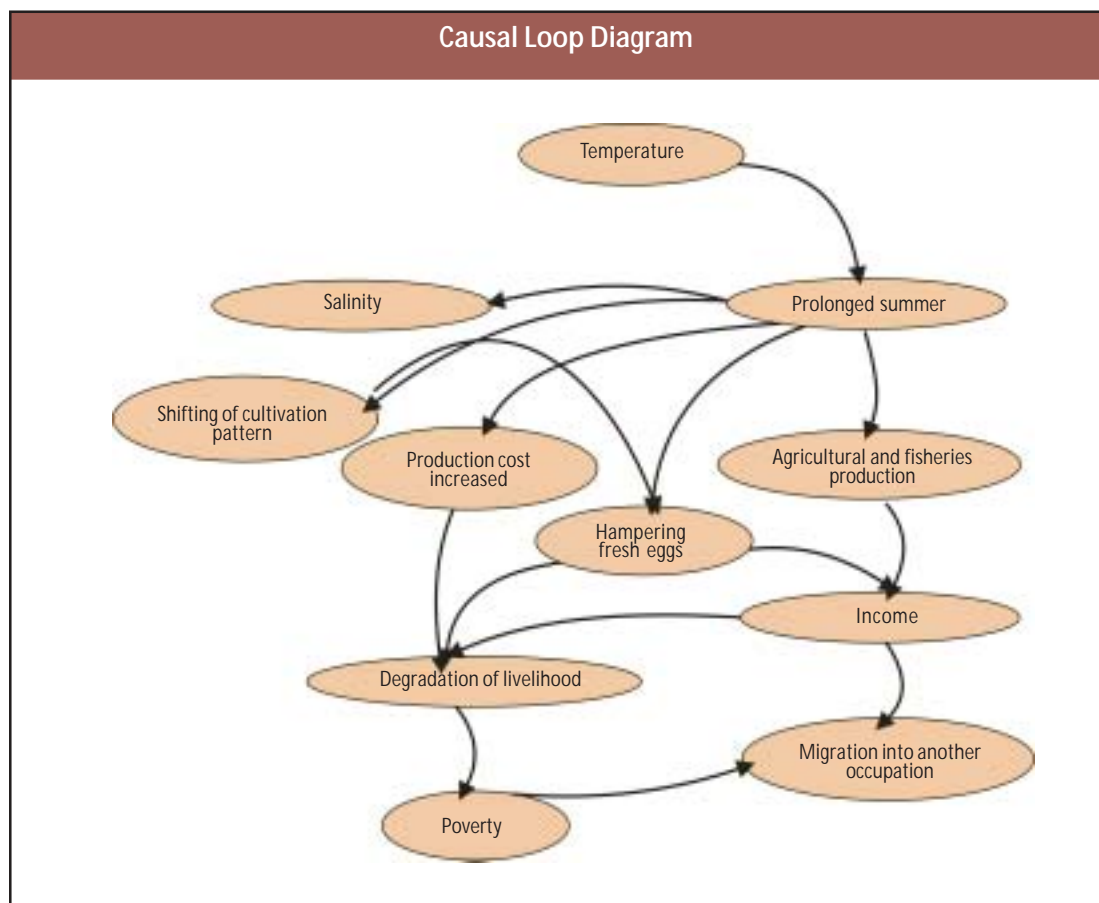
*Photo taken by Md. Sarwar Hossain/USS Jessore Bangladesh.*



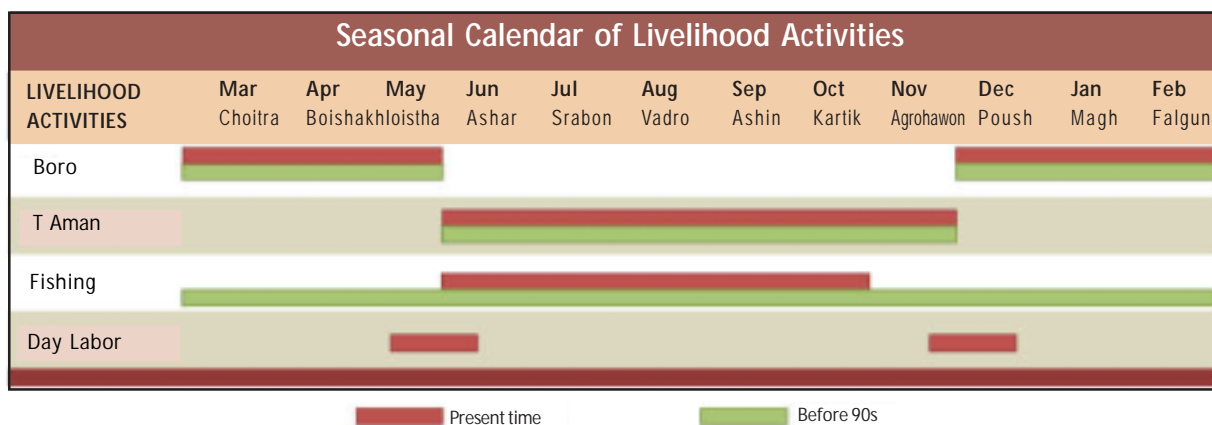


| Problem Matrix |                          |                       |           |          |
|----------------|--------------------------|-----------------------|-----------|----------|
| Sl no          | Problem                  | intensity x frequency | Score     | Rank     |
| 1.             | Rainfall                 | 4 x2                  | 8         | 4        |
| 2.             | Drought                  | 5 x3                  | 15        | 2        |
| 3.             | Lack of fish             | 4 x2                  | 8         | 4        |
| 4.             | Fog                      | 2 x2                  | 4         | 5        |
| 5.             | Salinity                 | 4 x2                  | 8         | 4        |
| 6.             | <b>Temperature</b>       | <b>5 x5</b>           | <b>25</b> | <b>1</b> |
| 7.             | Hail Storm               | 2 x2                  | 4         | 5        |
| 8.             | Flood                    | 0                     | 0         |          |
| 9.             | Cyclone                  | 1 x1                  | 1         | 7        |
| 10.            | Riverbank erosion        | 1 x2                  | 2         | 6        |
| 11.            | Lack of irrigation water | 4 x3                  | 12        | 3        |
| 12.            | Drinking water           | 0                     | 0         |          |

Score =  $\sum \text{intensity}_i \times \text{frequency}_i / N$  ;  $N = 1, 2, 3, \dots, N$  Source: Ulashi Sreejony Sangha, 2010



Source: Ulashi Sreejony Sangha, 2010



Source: Ulashi Sreejony Sangha, 2010

### Source of livelihood trends (i)

| Source of livelihoods | Time land Mark<br>After 2000 | Time land Mark<br>90s | Time land Mark<br>Ershad Era |
|-----------------------|------------------------------|-----------------------|------------------------------|
| Paddy                 | +++                          | ++++                  | +++++                        |
| Fish                  | +++                          | ++++                  | ++++                         |
| Gardening             | +                            | +++                   |                              |
| Cattle                | +++                          | ++++                  | ++++                         |
| Tree Product          | ++                           | +++                   | +++                          |
| Van/ Rickshaw Pullar  | ++++                         | ++                    |                              |
| Stationary Shop       | +++                          | +                     | +                            |
| Labor                 | +++                          | +                     | +                            |
| Small Business        | ++++                         | ++                    | ++                           |

Source: Ulashi Sreejony Sangha, 2010

### Trends in livelihood activities (ii)

| Livelihood activity | In Past | Present   | Future    |
|---------------------|---------|-----------|-----------|
| Household maid      | Rare    | Common    | Increased |
| Paddy husking       | Common  | Increased | Decreased |
| Boiling paddy       | Common  | Increased | Decreased |
| Labor               | Rare    | Increased | Increased |
| Rickshaw Puller     | Common  | Increased | Increased |
| Agriculture         | Common  | Increased | Decreased |
| Fishery             | Common  | Decreased | Decreased |
| Shrimp Cultivation  | Rare    | Increased | Increased |

Source: Ulashi Sreejony Sangha, 2010



| Adaptation Practice |               |   |   |
|---------------------|---------------|---|---|
| Current Risk        | Current Trend | Anticipated Impact  | Adaptation Practice   |
| Salinity            | Increasing    | <ul style="list-style-type: none"> <li>▪ Reduced agricultural and fish production; damaged fish eggs</li> </ul>   |   |
| Erratic Rainfall    | Increasing    | <ul style="list-style-type: none"> <li>▪ Decrease in agricultural production, specially hampering <i>aus</i> and <i>aman</i>, <i>til</i> and <i>jute</i> during the panicle and spikelet initiation time</li> <li>▪ Upper land crops are dying for lack of water</li> <li>▪ Production cost increased</li> </ul>  | <ul style="list-style-type: none"> <li>▪ Cultivating hybrid instead of local variety</li> <li>▪ Dependency on fertilizers and boring for irrigation</li> </ul>  |
| Temperature         | Increasing    | <ul style="list-style-type: none"> <li>▪ Weather is getting warmer and seems to be intolerable</li> <li>▪ Dependency on fertilizer and ground water instead of rain water, which used to nourish the soil naturally</li> <li>▪ <i>Aus</i> production is becoming rare; farmers are struggling with other local crops varieties</li> <li>▪ Salinity is increasing due to the warm weather; which makes the water evaporate more quickly</li> </ul> | <ul style="list-style-type: none"> <li>▪ Cultivating hybrid instead of local variety</li> <li>▪ Dependency on fertilizer and boring for irrigation</li> <li>▪ Local people used to install tube wells in 80-100 ft depth, but now the depth is 150-200 ft.</li> </ul> |
| Salinity            | Increasing    | <ul style="list-style-type: none"> <li>▪ Fish and eggs are dying</li> <li>▪ Rice production is becoming difficult</li> </ul>  | <ul style="list-style-type: none"> <li>▪ Shrimp cultivation</li> </ul>  |
| Flood               | Decreasing    | <ul style="list-style-type: none"> <li>▪ Losing the fertility of soil for lack of sediment</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Dependent on fertilizer</li> </ul>   |
| Riverbank erosion   | Decreasing    |   |   |

Source: Ulashi Sreejony Sangha, 2010

### Climate Change Assumptions in the EIA

It is clear that climate change was not considered or given due attention in the EIA, i.e., climate change assessment was not part of the project design; no clear adaptation linkages were presented. The National

Adaptation Programme of Action (NAPA) of Bangladesh had already been published in 2005. The project inception report was submitted in 2007. It goes without saying, therefore, that climate change should have already been a major consideration even at the design phase of the project.



**INTOLERABLE.** Fish are dependent on this wetland biodiversity for breeding and feeding. Fish resources are now declining due to intolerable salinity level.

*Photo taken by Md. Sarwar Hossain/USS Jessore Bangladesh.*

An integrated hydrology/water management climate change impact assessment framework could have been useful to identify and evaluate possible and/or appropriate adaptation strategies. A community, demand-driven approach in determining area vulnerabilities and risks is also warranted. For instance, the communities have reported that they are not really experiencing flood in a way that entails huge infrastructural work. Flood shelters (a recommendation in the NAPA) would probably suffice but this has been totally ignored in the project discussion.

Clearly, the ADB has not learnt any lesson from the Khulna-Jessore Drainage Rehabilitation Project (KJDRP). In the KJDRP project area, flood, erosion and sedimentation are the common negative outcomes that show how the ADB's irresponsibility, lack of foresight and imagination have jeopardized "the sustainability of natural resources and endanger the livelihood of the millions of people who are dependent upon those resources."<sup>5</sup>

The ADB has failed to mainstream and link the climate change issue in the said development project, and to adequately consider the climate change implications of the proposed project, if any, through their EIA process.

## **Incorporating Climate Change Considerations in the Integrated Water Resources Planning and Management Project**

In a developing country such as Bangladesh, where the development of the agriculture and the fisheries sector remains a paramount task, the issue of climate change should be given priority. Both the NAPA and the Poverty Reduction Strategy Paper (IMF Country Report No. 05/410, October 2005) have identified climate change as one of the important concerns for water resource management. It is not too late for the ADB to re-assess and re-tool itself concerning this matter.

In the project objectives, the enhancement of livelihood through agriculture and fishery development was specified as an important issue. The ADB, however, has failed to indicate whose development and what development it was carrying out. Credit, tree plantation, fisheries development and other non-structural agricultural support measures are included in the main approaches but these were not clearly articulated during the project conception. One of the recommendations in the NAPA is to conduct studies in order to understand local coping mechanisms in the face of drought; invention of drought-resistant, saline-tolerant crop; no-tillage cultivation approach; and flood shelter, among others. However, the ADB failed to tackle these aspects.

Despite the EIA's attempt to be comprehensive (as per the general guidelines), the EIA report falls short in further elucidating important topics such as ecology,



**PUBLIC PARTICIPATION.** The community calls for public participation in protecting and identifying erosion-prone areas.

*Photo taken by Md. Sarwar Hossain/USS Jessore Bangladesh.*

<sup>5</sup> S. Jahangir Hasan Masum, "Climate Fund Not to be Entrusted to IFIs: A Lesson from the ADB Experience in Bangladesh," 15 December 2008. Available at: <http://www.forum-adb.org/inner.php?sec=4&id=52&b=1>



problem, increased salinity and intrusion, change in the river morphology, and more importantly, climate change. These might have been mentioned in passing, but the impact of the project and the total environment on the socio-economic conditions and livelihood patterns in the community remains missing.



**UNUSUALLY DRY. No water in chachuri beel even during the rainy season.**

*Photo taken by Md. Sarwar Hossain/USS Jessore Bangladesh.*



**THE COMMUNITY SPEAKS. The research team facilitates the Focus Group Discussion (FGD).**

*Photo taken by Md. Sarwar Hossain/USS Jessore Bangladesh.*

giving them substantive participation in the planning and designing stages and meaningful participation in the local decision-making processes.

## Concluding Remarks

In spite of the potential adverse impact of climate change and the availability of various tools for investigating its dimensions, actual environment impact assessment with respect to water management has yet to fully integrate climate change analysis. For one, the integrated water resources management (IWRM) tool paves a good opening for adaptation to climate change. There is a wide latitude, therefore, to incorporate climate change assessments into the EIA process. For instance, water allocation mechanisms and flood/drought management (as part of IWRM) can be readily categorized in the universe of coping mechanisms with respect to climate variability.<sup>6</sup>

The EIA process for this particular ADB project could be enhanced by tailoring adaptation assistance to local needs in order to address pressing local vulnerabilities on the basis of robust climate change impact assessment methodologies. Needless to say, this also entails involving the affected stakeholders early on and

Efforts to develop guidelines and regulations to incorporate climate change impacts into the EIA process for projects in the water sector, for instance, are already on the way. In fact, “the Ministry of Environment of Spain considers EIA as an entry point to integrate adaptation to climate change across sectors since the Ministry can use its current legal mandate to do this” (Agrawala et al., August 2010).<sup>7</sup> In the case of Bangladesh, its National Water Management Plan Project (2005)<sup>8</sup> “recommends the inclusion of climate change considerations into the EIA process, in particular, in the development of baselines describing the environment,” though “this document does not provide any further guidance on how to do this” (Agrawala et al., August 2010). In addition, Bangladesh’s NAPA “recognizes that climate change issues are not adequately considered during the design of water resources structures” and that “the lack of proper assessment of climate change in designing and implementing structures make structural interventions more prone to climatic hazards.” (Agrawala et al., August 2010).

<sup>6</sup> See Cap-Net, *IWRM as a Tool for Adaptation to Climate Change: Training Manual and Facilitator’s Guide*, July 2009.

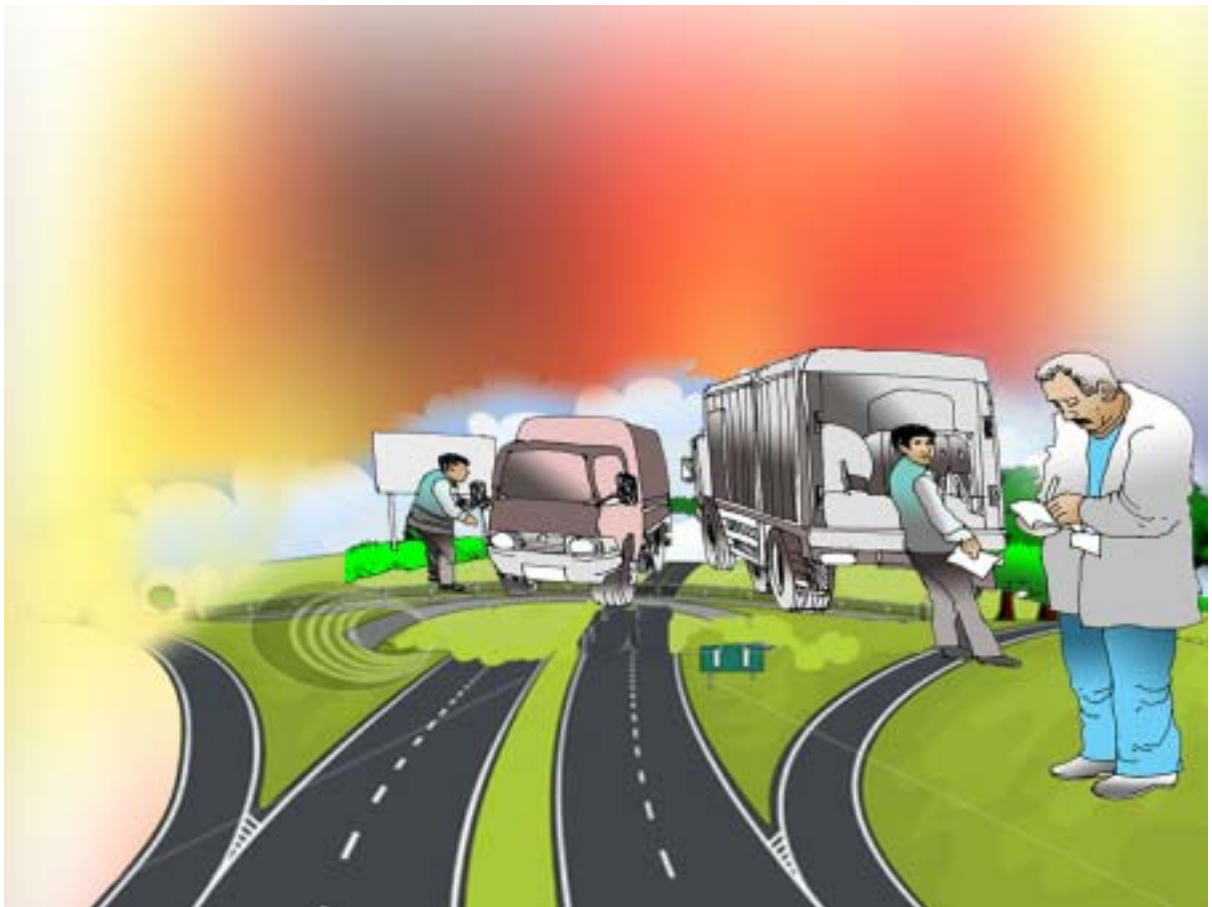
<sup>7</sup> Agrawala S., A. Matus Kramer, G. Prudent-Richard and M. Sainsbury, “Incorporating Climate Change Impacts and Adaptation in Environmental Impact Assessments: Opportunities and Challenges”, *OECD Environmental Working Paper No. 24*, OECD Publishing, August 2010.

<sup>8</sup> Government of the People’s Republic of Bangladesh, *National Water Management Plan Project: Guidelines for Environmental Assessment of Water Management (Flood Control, Drainage and Irrigation) Projects*, Ministry of Water Resources, 2005.

## The Masalli-Astara Highway Project

**“During the operational phase, emission of particulates as well as NO<sub>x</sub> and SO<sub>x</sub> from the diesel and gasoline engines on the highway will increase”**

*Irshad Abbasov and Elnur Ahmadov of Eco-Renaissance find out that climate change concerns are not clearly addressed by the EIA of this 57-km highway project in Azerbaijan, and see a need for policies with a special focus on transport demand management.*



\* The full version of the research by Irshad Abbasov and Elnur Ahmadov is available at <http://www.forum-adb.org>.



On 28 September 2007, the ADB approved a Multitranchise Financing Facility worth \$500 million for Azerbaijan’s Road Network Development Program.<sup>1</sup> The program aims to have an adequate, efficient, safe, and sustainable road network linking Azerbaijan domestically and internationally (i.e., transport development and trade facilitation). Its outputs include an improved national road network and an effective and efficient management of the road network.

The first tranche or Project 1, amounting to \$200 million, covers the construction of a new expressway between Masalli and Astara (part of the southern road transport corridor) and the rehabilitation of local roads in the project area.<sup>2</sup>

## Project Description

The proposed Masalli–Astara motorway (about 57–59 kilometers) is the southern section of a proposed project to rehabilitate and upgrade 240 km of the existing M3 highway from Alyat to Astara. The Government of Azerbaijan has requested a World Bank loan for the northern 180 km (75%) from Masalli north to Alyat, and financial assistance from ADB for the southern 57 km (25%) from Masalli to Astara on the Iranian border. The Project comprises four components:

- (i) Construction of a four-lane expressway from Masalli to Astara (about 57 km) on the Alyat–Astara southern road corridor;
- (ii) Installation of vehicle weighing stations and procurement of maintenance equipment for the Masalli–Astara expressway;
- (iii) Rehabilitation of local rural roads to enhance local communities’ access to the Masalli–Astara expressway; and
- (iv) Project management support and capacity building for the road sector.

Modernizing the highway is “needed since the existing M3 is incapable of conveying the anticipated increases in traffic.” Plus, “complete fencing on both sides of the right-of-way, coupled with improved signage and controlled access, will provide substantially improved safety for local residents” (SEIA, January 2007).<sup>3</sup>

## Scope of the EIA

The environmental impact assessment (EIA) system in Azerbaijan is “characterized as a “dual” system which currently contains elements of the State Ecological Review system inherited from the former Soviet Union, and elements of a “classic” EIA system incorporating the best EIA practice as understood in developed countries” (SEIA, January 2007). The State Ecological Review “allows state authorities to verify that virtually all proposed economic activities conform with environmental requirements. The procedure is supported by the national framework of environmental legislation and does not require the consideration of alternatives or mitigation measures, nor does it explicitly define the content of an EIA report. It largely focuses on verifying that the proposed activity complies with environmental standards and rules, and provides for very limited public participation.” The EIA process has been dictated by Azerbaijani law.

On the other hand, ADB’s Environmental Assessment and Review Framework and Procedure for the project includes “the regulatory framework of the government and ADB, institutional responsibilities of various agencies such as RTSD, due diligence, and capacity building. The Government’s EIA requirements—the legal and regulatory framework mandating the formal obligation to predict and mitigate potential environmental impacts resulting from road construction—are based on the provisions of the Law of the Republic of Azerbaijan on Environmental Protection (February 1999) and the Law on Automobile Roads (March 2000)” (SEIA, January 2007).

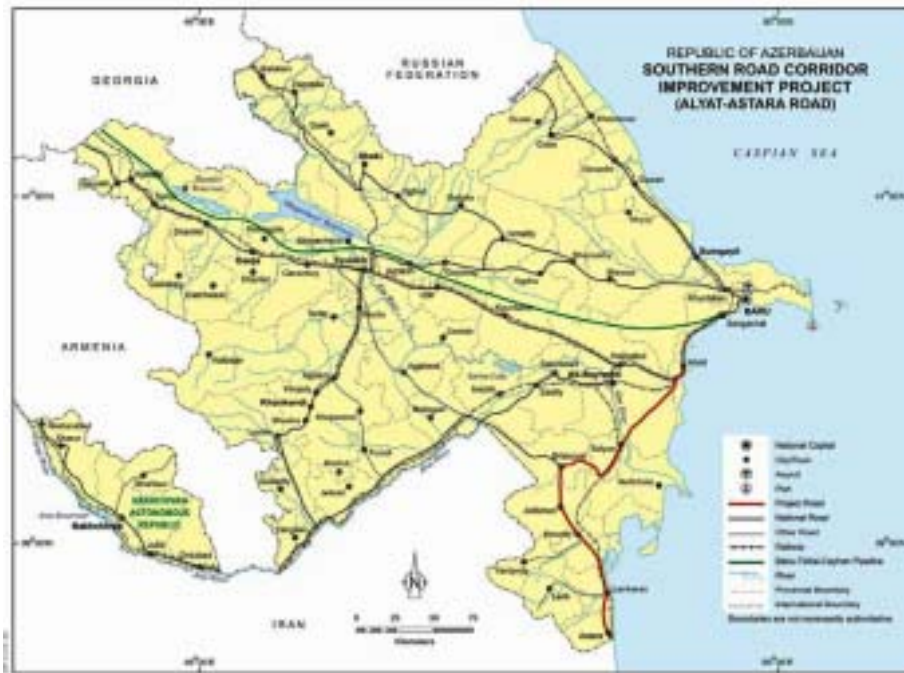
<sup>1</sup> Formerly Southern Road Corridor Improvement Project. Azerbaijan Ministry of Transport developed a Road Network Development Program for 2006 – 2015, which considers construction, upgrade, and rehabilitation of 3570 km of 64 state roads and 5928 km of 58 secondary roads. See, <http://www.adb.org/Projects/project.asp?id=39176>

<sup>2</sup> Project 2, under the Road Network Development Program, aims to improve and rehabilitate the two-lane, 39-kilometer paved Ganja bypass road, which forms part of the East-West highway connecting Baku to the Georgian border. This project will contribute to sustained economic and social development in Azerbaijan. [<http://pid.adb.org/pid/LoanView.htm?projNo=39176&seqNo=03&typeCd=3>]

<sup>3</sup> Azerbaijan Road Transport Service Department, Summary Environmental Impact Assessment Project Number: 39176, Proposed Multitranchise Financing Facility Republic of Azerbaijan: Road Network Development Investment Program Tranche I: Southern Road Corridor Improvement, ADB, January 2007.



## Overview of Masalli-Astara Highway Project (highlighted in red)



The EIA concludes that “the overall environmental impacts of Project 1 will be insignificant and can be minimized by adequate mitigation measures included in the environmental management plan.”<sup>4</sup> Results of reviewing the final draft EIS of the highway project are summarized in the table at the next page.

### Climate Assumptions in the Masalli-Astara Highway Project

Did the EIA consider both the “effects of the road on the environment/climate” and the “effects of the climate/environmental conditions on the road”? Whether wittingly or not, climate change was not considered in the original assessment. There is no clear mention of climate-related impacts that the highway project would more or less bring. The EIA report is considered inadequate when it comes to the assessment and mitigation of likely adverse environmental impacts as well as climate change effects. No government policy has been developed either to provide direction towards this end.

On a more general note, ADB’s 2006 Country Strategy and Program (CSP) for Azerbaijan revealed superficial considerations with respect to climate change. ADB’s strategy, in fact, merely aligns itself with the government’s programs and development goals, which may or may not put climate change at the forefront of its relevant policies, considering that there are other national or local pressing issues to address. While the CSP considers lending for renewable energy and flood mitigation project, a comprehensive and sectoral climate change assessment for Azerbaijan remains much to be desired.

### Incorporating Climate Change Considerations in the Masalli-Astara Road Project

While roads play a pivotal role in Azerbaijan’s national economy, road transport, in general, is viewed as one of the chief and growing GHG-emitting sectors. Globally, it was estimated in 2004 that the transport sector generated 23% of world energy-related GHG emissions.<sup>5</sup> Road transport, in particular, is responsible

<sup>4</sup> [http://pid.adb.org/pid/LoanView.htm?projNo= 39176&seqNo= 02&typeCd=3](http://pid.adb.org/pid/LoanView.htm?projNo=39176&seqNo=02&typeCd=3)

<sup>5</sup> Intergovernmental Panel on Climate Change (IPCC), 2007. *Climate Change 2007: Mitigation of Climate Change, Fourth Assessment Report*. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. Available online at: [http://www.ipcc.ch/publications\\_and\\_data/ar4/wg3/en/contents.html](http://www.ipcc.ch/publications_and_data/ar4/wg3/en/contents.html)





| Results of Reviewing the Final Draft Project EIS     |   |
|--|---|
| Sections of EIS                                      | Notes   |
| Description of the environment                       | <ul style="list-style-type: none"> <li>▪ This section considers the baseline climatic conditions including amount of precipitation, atmospheric humidity, and other characteristics.</li> <li>▪ There is a discussion of historic fluctuations of the Caspian sea level, as well as concern for its future rise.</li> <li>▪ The section also describes tree species, shrubs and grass plants which will be affected. It is estimated that around 328 trees (age distribution 7 – 65 years) will be lost.</li> </ul> |
| Alternative options                                  | <ul style="list-style-type: none"> <li>▪ Only loss of trees and distance to protected areas are considered under the environmental criterion.</li> </ul>  |
| Likely environmental impacts and mitigation measures | <ul style="list-style-type: none"> <li>▪ There is no clear statement about the contribution of the road project to GHG and, consequently, to climate change in the region.</li> <li>▪ An assessment of impacts on ambient air is very superficial (brief qualitative statement).</li> </ul>   |
| Public consultations                                 | <ul style="list-style-type: none"> <li>▪ Main concerns identified were compensation and resettlement, and passage across the road. No environmental concerns were raised.</li> </ul>  |
| Appendix Environmental Management Plan               | <ul style="list-style-type: none"> <li>▪ Considers an offset program – an intensive tree-planting program</li> </ul>  |

for 74% of total transport CO<sub>2</sub> emissions. Even though the carbon footprint of the Massali-Astara highway project is minimal (around 2.2%) when compared to in-country road transport CO<sub>2</sub> emissions, it is expected that GHG/CO<sub>2</sub> contribution of the highway project will grow due to its extensive use, as trade links between Russia and Iran become stronger.

ADB has been mostly involved in Azerbaijan's transport sector, followed by the water and energy sectors. A closer look into transport sector investment reveals that more than 95% of total transport sector lending has been directed to road/highway improvement and

development projects – all the more that a climate change assessment framework and/or guidelines for road projects need to be established.

Moreover, fluctuations of the Caspian Sea level have a direct bearing on the project as it lies on the coast of the Caspian Sea. Predictions show that the sea level will decrease – reaching 27.5 m (absolute level) by 2016, which translates into a decrease of 50 cm on average per year.<sup>6</sup> Unfortunately, no specific climate-proofing strategy has been embedded in the Massali-Astara Highway Project – ADB's climate-proofing agenda, notwithstanding.

<sup>6</sup> Russian Federal Services, Hydrometeorology and Environmental Monitoring (RusHydromet). 2005. *Strategic prognosis of climate changes in Russia for the period of 2010-2015, and their impacts on Russian economy*. Moscow, Russia. Available online at: [http://new.climatechange.ru/files/Strategic%20prediction\\_Rus.pdf](http://new.climatechange.ru/files/Strategic%20prediction_Rus.pdf)



**Counting Cars. The road survey conducted on Ganja-Yevlakh highway.**

*Photo taken by Elnur Ahmadov.*

## ADB's Climate Proofing Agenda

Climate proofing infrastructure projects primarily aim to reflect climate risks in infrastructure design and incorporate adaptation measures best-suited for the project. In ADB's words, climate proofing is a "shorthand term for identifying risks to a development project, or any other specified natural or human asset, as a consequence of climate variability and change, and ensuring that those risks are reduced to acceptable levels through long-lasting and environmentally sound, economically viable, and socially acceptable changes implemented at one or more of the following stages in the project cycle: planning, design, construction, operation, and decommissioning."<sup>7</sup>

In 2005, ADB published *Climate Proofing: A Risk-based Approach to Adaptation*, wherein it admonished that: "For infrastructure projects, it is possible to avoid most of the damage costs attributable to climate change, and to do this in a cost-effective manner, if climate proofing is undertaken at the design stage of the project. Cost-effectiveness can be further enhanced if environmental

impact assessment (EIA) and related procedures require that all development be climate proofed. Climate proofing communities can also be cost-effective if planning and regulatory measures take into account both current and future climate-related risks." According to ADB, "governments should ensure that all proposed, new, and upgraded development projects are climate proofed at the design stage" not only as "part of good professional practice" but also "as part of enhanced (climate proofed) environmental impact assessment (EIA) procedures."

The ADB reiterated its commitment "to ensure that projects and programs take account of predicted changes in rainfall patterns, the severity and frequency of storms, accelerated glacial melting, sea level rise, and other impacts."<sup>8</sup> It is somewhat surprising, therefore, that the ADB has failed to include climate proofing measures in the Masalli-Astara Road Project.



*Photo taken by Elnur Ahmadov*

The case of Timor-Leste's Road Network Development Sector Project is instructive.<sup>9</sup> As pointed out in the Report and Recommendation of the President to the Board of Directors for the Timor-Leste Road Network Development Sector Project (October 2009):<sup>10</sup> "Understanding how climate change may affect the road

<sup>7</sup> ADB, *Climate Proofing: A Risk-based Approach to Adaptation*, Summary for Policy and Decision Makers, 2005.

<sup>8</sup> See, <http://www.adb.org/climate-change/cc-adaptation-climate-proofing.asp>. As reported on its website: "Climate proofing projects at ADB date back to 2003, when ADB provided regional technical assistance to several Pacific countries to climate proof small-scale infrastructure." Also, "ADB is working with other multilateral finance institutions to develop screening tools to assess project-level risks associated with climate change impacts."

<sup>9</sup> The Consultant's Reports include a separate volume for Climate Change Assessment, see <http://www.adb.org/Documents/Reports/Consultant/38618-TIM/default.asp>. See also the Climate Change Adaptation component of the Cambodia Rural Roads Improvement (RRP CAM 42334), available at <http://www.adb.org/Documents/RRPs/CAM/42334/42334-01-cam-oth-03.pdf>

See also, "Climate Proofing Timor-Leste's Roads", May 2010, available at:

<http://www.adb.org/documents/information/knowledge-showcase/climate-proofing-timor-lestes-roads.asp?p=kmlshow> and "Ahead of the Curve: Chen Chen – Giving Climate Change its Due Attention", May 2010, available at: <http://www.adb.org/documents/periodicals/intersections/2010/climate-change-due-attention.asp>

<sup>10</sup> Available at: <http://www.adb.org/Projects/project.asp?id=43322>



**The Ganja-Yevlakh highway.**

*Photos taken by Elnur Ahmadov.*

sector will allow appropriate measures to be taken to avoid losses due to climate change and to take advantage of opportunities that arise. Taking into consideration the impact of climate change and formulating adaptation measures to be incorporated into the project design will minimize the adverse impact; hence, ensure that the Project achieves its poverty reduction goals. Peak rainfall, the most important climate parameter in road engineering, will be the focus of the climate analysis. A “no-regret” approach to climate proofing will be taken to minimize the country’s vulnerability to the adverse effects of climate change and minimize risks of road sector investment. Moreover, the “Project will build climate proofing measures into road rehabilitation and maintenance by considering future climate data when reviewing engineering designs and plans and by making adaptation measures part of the environmental management plan (EMP).” As specified in the Design and Monitoring Framework of the said project, climate change adaptation assessment tools will be developed for the road project design; climate proofing measures will be incorporated into the engineering design; and climate proofing measures will also be incorporated into civil works contracts.

## Recommendations

Although climate change and its impacts are recognized by almost all multilateral development banks including ADB, these concerns/considerations are neither clearly articulated in the ADB-prepared Azerbaijan Country Strategy and Program of 2006, nor in the final draft EIA of the highway project. In fact, the final draft EIA does not fully assess environmental impacts of the highway project, and most importantly climate change concerns are not clearly addressed.

Moreover, despite the fact that road transport is increasingly contributing to GHG emissions, ADB has kept investing in the Azerbaijan transport sector, with more than 95% of the total transport sector-directed investment going to road/highway improvement and construction projects. To achieve a drastic reduction in GHG, which are mostly CO<sub>2</sub> emissions from the transport sector, alternative policies need to be adopted with a special focus on transport demand management. Results of the round table meeting point out to the need for wider disclosure of project information such as EIS, final route designs, and other related information. The following recommendations are hereby forwarded:

- For such projects funded by ADB or other multilateral development banks, project information including EIA should be made available to the general public and it should be available in Azerbaijani language (or in the local language for that matter).
- Organizing roundtable meetings before the start of a project is very important and crucial for ensuring that views and opinions of affected people and other relevant stakeholders are incorporated into the decision-making process.
- ADB should step up accountability of national executing agencies and organize frequent visits to project affected sites.
- The important role played by international organizations in adopting a democratic EIA process in Azerbaijan is underscored, which means that similar changes can be brought about in the context of mainstreaming climate change (CC) impacts in the country.



As part of the field work, around table meeting with various stakeholders such as a representative of the Regional Office of Azerbaijan Ministry of Ecology and Natural Resources (AMENR), NGO leaders and municipality representatives was held in Lenkoran city.

*Photos taken by Elnur Ahmadov.*

- It is strongly recommended that the ADB review its 2006 CSP for Azerbaijan. See to it that climate change concerns are incorporated into priority development sectors. Reconsider the priority sectors for ADB lending. This will help address CC impacts and build priority CC adaptation capacity in Azerbaijan. Alternatively, ADB could develop sector-specific strategies to address particular concerns and needs of individual sectors of the economy in Azerbaijan.
- ADB should mainstream not only CC adaptation measures into its policies but also require the assessment of CC impacts of proposed development projects by national executing agencies.
- Further lending efforts in the transport sector should be directed towards transport modes with lower or zero GHG emissions, as well as cover such aspects as transport demand management, fuel diversification, and infrastructure for non-motorized transport means. It is hoped that future developments in the transport polity of Azerbaijan will also consider energy efficiency and associated cuts in GHG emissions from road transport.
- Reflect climate-related risks in project design. Ensure that the risks to infrastructure are not increased due to climate variability and change. Revise EIA regulations and codes to reflect new information and contingencies. Make climate proofing a standard practice.



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The NGO Forum on ADB is an Asian-led network of civil society organizations and community groups that has been monitoring policies, projects and programs of the Asian Development Bank. The Forum does not accept funds or any other grants from the ADB.

