Workshop on
Environmental Management Aspects of Highway Projects

Report on Proceedings

Organized by
The World Bank
70, Lodi Estate, New Delhi 110 003 (India)

January 31, 2006
PROCEEDINGS

CONTEXT OF THE WORKSHOP
The World Bank has been involved in the Highways sector in India in seven states from the mid nineties. Since then the Bank has constantly striven to integrate environmental objectives to ensure environmentally sound and sustainable projects. While using Environmental Assessment (EA) as the principal tool for achieving the environmental objectives, the Bank has gathered varied experience documented as part of a AAA output titled: “Management of Environment and Social Issues in Highway Projects in India”. With five new state highways projects in the pipeline, the Bank is keen to translate this learning into processes and actions that would help mainstream environmental concerns in roads projects.

Analysis of the earlier generation of highway projects by the Environment Unit of the Bank had identified clear advantages of an improved Terms of Reference for Environmental Assessments (EAs). In response to demands from internal as well as external clients, for a harmonized approach to environmental management during project preparation, the environment team prepared a model ToR for discussions and finalization in an appropriate forum. A first draft of a Generic Environmental Management Plan (GEMP) was also prepared to invite suggestions and generate discussion.

It is in the above context that a workshop was organized on 31st January 2006, with the overall objective to gain from past experience, discuss and move forward on finalizing an effective ToR and a Generic EMP for the new generation of projects.

The workshop participants included Project staff from 10 states and their consultants; Transport and Environment teams from World Bank offices in Afghanistan, India, and Pakistan; and the Indian Roads Congress. The draft ToR and Generic EMP documents and selected outputs from the AAA study were circulated in advance to all the participants for their perusal and comments.

The workshop also fulfilled a strongly felt need for experience sharing among the concerned states and at the same time provided critical insights to the Bank on the possible way forward.
SETTING THE AGENDA

Environment Assessments (EA): As the EA is a key element of project preparation, improving its effectiveness as a tool that would add further value to engineering analysis and decision-making in roads projects is vital. The workshop provided an appropriate forum to seek experience of implementing states on various elements of the EA ToR that needed to be strengthened, modified or deleted as the case may be, based on whether the element:
- added value to strengthen engineering analysis.
- could be modified and made more implementation oriented.
- was redundant and simply pointless data compilation.

Furthermore, the attempt was to seek comments and suggestions on incorporating better procedures in the ToR to ensure harmony and synchronization with other elements of project preparation such as the feasibility studies, design, preparation of detailed project report, etc. apart from synergy with the social aspects (at the scoping stage).

Environment Management Plan (EMP): The environmental assessments for road projects result in Environmental Management Plans (EMPs) that address adverse impacts. These EMPs largely focus on construction related impacts (generally of high magnitude), are replicable across the projects, and are mostly concerned with following good practices and standard procedures during design and implementation stages. These EMPs can be standardized in terms of construction and contract specifications for ease of implementation. Further, there is a strongly felt need to mainstream environmental management with the MoRTH and the Indian Roads Congress (IRC) specifications and codes of practices/guidelines. This would however have to fit within the FIDIC contract documents to ensure compliance by all entities, i.e., Employers, Contractors and Supervision Consultants. The ultimate aim is to address most of construction related impacts through the generic EMP. In the next generation of projects, the corridor specific EMP would therefore only be prepared if required based on the issues identified by the EA. This concept was piloted in the Lucknow-Muzaffarpur National Highway Project and the Kerala State Transport Project - Phase II works. These EMPs were then further analyzed by the Bank and a first cut generic EMP was prepared. This was sent out for comments and formed the basis of discussion in this workshop.

The key issues thus taken up for deliberation in the workshop were:
- EA ToR
- Generic EMP
- Integration of EMPs into BoQs and Contract Documents.
The objectives of the workshop were specifically to:

- Gain from past experience
- Develop a practical Terms of Reference (ToR) for preparation of EA/EMP for new and upcoming projects
- Develop the format and content of the generic part of EMP (which covers common construction management issues)

PARTICIPANT PROFILE

Participants invited to the workshop included:

- Experienced project personnel from states that have already received World Bank loan assistance i.e. Gujarat, Karnataka, Kerala, Andhra Pradesh, Uttar Pradesh, Tamil Nadu and Mizoram.
- Project personnel from states where the Bank is currently engaged in preparing forthcoming projects – Punjab, Assam, Orissa, Himachal Pradesh.
- Secretary, Indian Roads Congress.
- The World Bank team comprised members of the environment and transport sector units from the New Delhi office as well as from Afghanistan and Pakistan offices.

Professionals who participated represented a wide range of disciplines including design, civil engineering, pollution control, environment management, etc.

The detailed agenda and the list of participants are given at annex-I and II.

HIGHLIGHTS OF DELIBERATIONS

The one-day workshop was divided in two sessions. The pre-lunch session encapsulated the experiences of the seven states in terms of EA process during preparation while the post-lunch session concentrated on the generic EMP. Comments on the draft ToR and EMP were consolidated in the final session of the afternoon.

1. PRE-LUNCH SESSION ON EA ToR:

The workshop was opened by Sonia Sandhog, Senior Environmental Specialist with the Bank with introductory remarks that brought out the background and context of the workshop. The tone of the deliberations was set by the Lead Transport Specialist, George Thracian of the World Bank. He brought out the following points in his presentation:

- Environment assessment should in fact be ‘environment analysis’ and it should form an integral part of the ‘design spiral’.
- Mitigation alone does not allow project implementers the scope to look at larger issues like hydrology and maintaining the health of fragile ecosystems.
- EA can no longer be seen as just contract obligation/clearance requirement but a tool to add value to the project. Better Easy are thus needed for more effective design.
- Designers and engineers should understand that they were not simply making roads but ‘landscapes of the future’. Highways were an indicator of development and the first impression of the landscape came from the perspective of roads.
As a prelude to the presentations from the states, Arnab Bandyopadhyay, Highway Engineer from the Bank introduced the main issues with regard to EA ToRs. He brought in the engineer’s perspective and admitted that engineers tended to give more importance to engineering/construction aspects. His presentation revolved round the following main points:

- EA had the biggest chance of success when the recommendations were well integrated into engineering designs and on to implementation. Sound EA outputs definitely enhanced the quality of engineering.
- Experience from earlier projects had shown several problem areas including; late start of the EA process, inadequate time and resources for EA, lack of experience among professionals and poor coordination between environment and engineering teams.
- In many earlier projects, during feasibility stage, EA output could not inform the cost/benefit analysis or life cycle models and thus prioritization of options (shortlist of projects). Some states like Gujarat, Kerala and Karnataka had managed to do well by integrating environment cost-benefit into their models.
- In category-A projects, independent reviews by consultants often came up with important issues too late in the project cycle to be of any real use.
- Repeated stakeholder consultations (public involvement) are critical as they have vital knowledge of the area, which can contribute to increasing sustainability options of projects. In some projects there were gaps in this process leading to implementation problems later. In one example from an urban transport project, a second round of public consultation was necessitated to construct a retaining wall as vital inputs were missed earlier.
- In the first generation of projects, alternatives had been mainly based on engineering criteria and environmental issues took the shape of a set of mitigation measures. In Mizoram, for example, huge disposal problem of excavated material cropped up; much later it was seen that a lot of areas needed huge dumping of material to create better geometrical design.
- Joint environment and engineering teams should be involved in ground-truthing surveys to ensure remedial /enhancement measures suggested were implementable. During a visit to a state highway project, a Bank team found that the fresh water pond marked for rehabilitation work was not where it was supposed to be, as the engineers had already made an alignment change affecting the chainage.

The speaker concluded that road engineers had not used past experience with environmental aspects from other projects. He hoped that the discussions would be productive and provide direction for improved synergy between EA and Engineering aspects of highway projects.

**Presentations**

- **KSHIP (Karnataka State Highway Improvement Project):**
  M.D. Nadaf, Incharge EMPU covered mainly four aspects in his presentation (i) comments specific to ToR of EA (ii) need for environmental costing in preliminary economic analysis (iii) environmentally sustainable options (iv) cumulative and induced impacts. He highlighted the following main points:
• Alternatives should consider not just technology or technical aspects as was the practice now, but suitability to local conditions.
• Several incidentals needed to become payable items to motivate compliance by contractors.
• The time schedule for EA study was inadequate.
• Scope for analysis of alternatives needed to be elaborated.
• Impact prediction tools / models may be mentioned.

KSTP (Kerala State Transport Project):
C.V. Sundara Rajan, Environment Specialist, brought out the diversity of problems that the project faced initially, due to both lack of knowledge and non-availability of experienced hands. He talked on the following major issues:
• Quantum of documentation work vis-a-vis timeframe was unrealistic.
• A lot of documentation\data work is duplicated.
• Inadequate resources both in funds and staff affect the EA process.
• Lack of support from other institutions including partner government agencies.
• Lack of awareness and team spirit in the PWD/PMT.
• Absence of counterpart staff with PIU.

UPSRP (Uttar Pradesh State Road Project):
S.K. Yadav, AEE, PIU, looked at some of the problems that the project faced during the preparation and subsequent implementation stages. He emphasized that:
• Data generated during the surveys was always found to be inadequate particularly with regard to affected utilities and PAPs.
• More support staff who for the field were required rather than environmental specialists.
• Suitable dispersion models should also be recommended for prediction of pollutant levels.
• Interdepartmental MoUs – even when signed were not effective. Other mechanisms for coordination among Government agencies should be considered.

APSHP (Andhra Pradesh State Highways Project):
Mir Yusuf Ali, Project Director, shared his experience of this project, which was completed in June 2004. The main focus of his talk was that environment issues had to be so managed that they did not cause hurdles and delay the execution of the project. He highlighted the following points:
• It was not necessary to be exhaustive and too prescriptive in ToRs and EMPs, as the issues under discussion were covered under relevant clauses in IRC and MoRTH provisions to safeguard the environment. FIDIC also had specific direction on environment for contractors. These needed to be studied in detail and applied as necessary. Reference was made to specific clauses of MoRTH ( IRC publication Standard Specifications for Roads and Bridges) such as: 111,105, 201,306-308 and FIDIC general condition 19.1.
• Provision could be made in contract for setting up lab/outourcing tests that are required such as on quality of air, water, noise levels etc. Also provide that contractor should nominate person as project manager for implementation of EA\EMP.
• Even penalty clauses were available for unfulfilled obligations of contract (FIDIC Cl.62).
• Contractors need thorough orientation on environmental aspects they would be responsible for during project implementation.
• Too much regulation and prescription to integrate environment with project outcomes may only be achievable at a high economic cost.

**TNRSP (Tamil Nadu Roads Sector Project):**
N. Prabhakaran, Assistant Engineer, PIU, sharing the experience in Tamil Nadu highlighted the importance of village level consultations which had been of immense help to them. Overall, he expressed satisfaction with the way his project had handled environment management issues. He pointed out that:
• Early information on the category of the proposed project would be very useful for manpower and resources planning in any project.
• A special coordinator with the PIU to follow up on reporting matters would be useful staff addition in Bank funded highway projects.
• Team leader (EA – independent review ToRs) should be an environment management specialist with knowledge/experience in road construction.

**DISCUSSION**

Following the presentations from the states, S. Vaideeswaran and Gaurav Joshi, Consultants on the Bank’s Environment Team, opened the discussion by underscoring a set of issues that had emerged from the presentations. Discussions were moderated with the idea of incorporating possible solutions in the EA ToRs.

**Making EA process and reports add value to the overall project**
There was general consensus that a mindset change was required among all stakeholders for this. The main points that emerged from the discussions were:

• EA process should begin very early in the project cycle.
• All partners in such an infrastructure project should take it as a ‘common mission’ and take extra trouble to understand the diverse viewpoints emerging from numerous dimensions like environment, social, design, engineering, etc.
• Greater interaction and integration is required between the environment and engineering teams from the start.
• Rates for some of the environmental management items to be executed by the contractor could be analyzed using the IRC rate analysis software after the specifications are standardized and included in the Bid documents.
• Post implementation impact of the project in environmental terms should be assessed against the baseline data and the monitoring process should continue for five years.
• A vital need identified was training for key engineering personnel apart from developing information manuals, etc. to help project professionals well before preparation.
• EA team should be made responsible for sorting out problems even during the implementation phase.
• There was generally acceptance that contractors needed orientation and training, and public participation through consultations should remain an active process throughout into implementation.

- **Improving the interface\synergy between engineering and environment aspects**
  The followings points emerged after some discussion:
  • ToRs need to explicitly address the linkage of various EA outputs with design process and outputs.
  • Design professionals needed orientation in environmental aspects and this could be addressed in ToRs.
  • There was a lack of a standardized code of good environmental practices and ToRs could guide consultants in this regard.
  • Environment management aspects should be reviewed by environment consultant and integrated in to the bid document to ensure compliance.
  • Increase interaction (and joint activity) between environment and engineering teams.

- **Screening and scoping issues**
  The need for early categorization of projects was actively debated under this. Main points that emerged were:
  • Category of project should be known definitely by end of screening.
  • Where necessary, the Independent Environment Reviewers should be brought in early rather than later to give them enough time to fully understand the project.
  • A more focused framework for surveys needed to be outlined in the ToRs.
  • There should be a joint survey by the engineering and environmental teams at an early stage.
  • More focused ToRs could ensure robust screening and save a lot of difficulties and duplication of effort later.
  • Strong environmental screening and scoping would also help in accurate analysis of alternatives.

- **Counterpart support with the PIU/implementing agency, during preparation**
  Some of the points that emerged after discussion were as follows:
  • There should be one counterpart staff for every line of expertise or activity with the PIU at the preparation stage and throughout the process of preparation.
  • Several participants mentioned difficulties faced with other government agencies like the forest departments or those concerned with utilities, which had a vital role but were not directly involved (U.P. state, for instance, had paid escalation costs to the contractor because of delay at the government level in clearing a forest area).
  • Discussion on the role of various government regulatory authorities concluded in the consensus that project managers had to do more to motivate and get support from different government agencies.

- **Penalties on contractors/consultants for non-compliance**
  There was active participation under this item and the following points emerged:
  • Despite provisions in FIDIC there was general reluctance with implementing agencies to invoke stringent penal clauses against contractors.
• It was felt that penalties were at best a deterrent and had a limited role with regard to enhancing overall environmental aspects.
• Environment consultant should remain liable till implementation was over.
• On the issue of how prescriptive ToRs could be, it was agreed that exhaustive and focused ToRs were useful particularly for new project implementers.
• It was necessary for the PCC/PIU to ultimately improve the inherent capacity within the main borrower/client to ensure the same problems did not crop up over and over again.

2. POST-LUNCH SESSION

This session was initiated by Piers Vickers, Senior Transport Specialist, World Bank. He affirmed that environment was very much a component of overall quality and not, as commonly perceived, bulky documents that were not enforceable or easy to implement. He highlighted the followings points:
• The management plans should get reflected in technical specifications as also the rate analysis and this should be a key area of more debate.
• In the paradigm of Cost, Time and Quality pulling in three directions, the first two elements seemed to be getting more priority than Quality.
• For more effective EMP implementation on the ground, it was necessary to build in significant detail in contract documents for the contractors, while strengthening the capacity of supervision consultants.
• The construction sector as a whole suffered from weak safety-related provisions; this was again an activity in which the contractor should be made more responsible and liable.
• Bank was committed to simplifying documentation procedures to the extent feasible and to reduce differences between requirements of Bank funded and other projects.

PRESENTATIONS ON EMP IMPLEMENTATION EXPERIENCE

- KSHIP (Karnataka State Highway Improvement Project)
  Susanta Latua, Environment Specialist, SMEC International, stressed on the need to combine knowledge, attitude and practice for proper implementation. He ascribed the relative success of Karnataka experience with environment management issues to proactive planning, which enabled them to anticipate and avoid many problems during execution. His main points were:
  • For orientation of contractors in his project, guideline documents and other training materials were prepared and given out.
  • Some issues did not generally get enough attention from the contractors during implementation unless they had been internalized as BoQ items. These included: traffic management; labour camp facilities; construction equipment maintenance and use; pollution monitoring and health check from occupation hazards, etc.
  • Contractors did not integrate the EMP into the daily activities even when they were better informed, and both strong supervision and deterrent penalties were required.
  • A problem area was the practice of sub-contracting where various items of work were taken up by small contractors who were completely ignorant of the environmental and social dimensions of the project.
KSTP (Kerala State Transport Project)
Sashidharan, SE, PIU, brought out the many good and bad lessons learnt during the implementation of EMP.
- Exhibiting a number of photographs as samples of both good and bad practices, the speaker referred to the experience as the state’s first major exposure to modern construction management systems.
- A particularly frustrating problem was the inordinate delays by government agencies responsible for shifting utilities like electric poles/substations, etc.
- Highlighted the public appreciation that followed the creation of this infrastructure.

GSHP (Gujarat State Highway Project)
The Gujarat experience was presented by Bhavesh Vyas, the Environment and Social Officer with the Supervision Consultant. He pointed out that many contract management issues translated into environmental and social problems. He took up the following issues in some detail:
- Use of ambiguous language in EMP leaving scope for different interpretations.
- Analysis of alternative needs to be site specific.
- More cooperation needed from other agencies handling utilities.
- Excessive subcontracting thus diluting effort to provide proper direction.
- Lack of direction in the case of specific non-compliance.
- Debris management issues.
- Safety practices (both traffic and people related).
- Labour related matters; identification of labour and ensuring minimum wages.

He strongly supported the view that line items should be introduced on several issues for contractors (like Safety and Environmental Monitoring) to ensure proper motivation and compliance.

MSRP (Mizoram State Road Project)
David Sapzova, Executive Engineer, referred to their complete lack of awareness and experience with regard to environmental and social aspects in highway projects. He brought out his main concerns as:
- Being a different terrain and also a biodiversity hotspot, the state’s learning experience was somewhat different from that of others.
- The ongoing project had exposed them to the first ever EMP.
- Apart from problems of integrating EMP into the contract documents, some of the EMP requirements were not practical. Further, some of the information on biodiversity was also not confirmed on the ground.
- Water and disposal sites were major problems in the region. Compliance also needed to be strengthened. The environment management plan should ultimately be simple, realistic and enforceable.

TNRSP (Tamil Nadu Road Sector Project):
N. Prabakaran, Asst Engineer (PIU), started his presentation with some of the positive steps that the project had taken in terms of environment enhancement: for instance, they moved water holes for animals away from the road deeper into the forest; design adjustments were made to help cattle cross roads safely; ponds were protected by retaining walls and deepened to compensate for loss of water, and innovative ways were used to deal with debris; etc. On the generic EMP, the speaker came up with several suggestions particularly with reference to:

- Traffic safety, quarry operations, and measures to conserve/control use of groundwater, generation/management of debris, drainage and flood control, and water, air and noise pollution.
- With regard to plantation works it was suggested that it should be given to a separate contractor or should be a separate contract for the civil works contractor.

UPSJR (Uttar Pradesh State Roads Project):
A.K. Misra, Incharge, ESDU, found the generic EMP too prescriptive and loaded with detail. While admitting the need for ensuring that the natural environment was not adversely affected due to road construction activities, he pointed out that:

- A lot of clauses in the EMP were either impracticable or unrealistic
- Problems of ambiguous definitions remained
- EMP in conflict with MoRTH specifications in several instances
- Monitoring requirements were unrealistic
- Lack of clarity in certain cases apart from over-ambitious expectations from project implementers on the ground.

Following the presentations, A.S. Ramakrishna, Environment Specialist with the Bank gave a brief presentation on the rationale behind developing the generic EMP and the ultimate objective of the exercise. While all pertinent existing management measures in MoRTH have to be referenced in the EMP, it is necessary to pinpoint ones that needed to be added or upgraded. He explained the concept of conditions precedent, which could become effective checkpoints before taking up a specific activity (e.g. Contractor can take up earthworks only after securing the topsoil and planning its use). Next, it would be necessary to match the mitigation measure with the MoRTH specification so that an effective monitoring mechanism could be created. Piers Vickers (World Bank) intervened to clarify that the EMP was a short term arrangement and ultimately everything should find its way into standard government stipulations. Till then, the Bank was dependent on such a mechanism and trying to improve it for the next generation of projects.

Remarks by Secretary, IRC
Before the open discussion, the Secretary IRC, R.S. Sharma, who actively participated in the afternoon session, briefly spoke of his experience with World Bank / ADB Projects, and assured the gathering that IRC was updating and upgrading its documents as there were several areas which needed greater clarity and direction. He referred to certain contradictory provisions, which needed to be sorted out. He cited the example of safety provisions not being in harmony with compensatory tree plantation works due to lack of space and suggested that innovative solutions like group plantation instead of strip plantation could be tried out. He assured the audience that their suggestions with regard to BoQ items, etc. would be considered in the on-going revision of technical specifications and rate analysis.
DISCUSSION ON GENERIC EMP

Tapas Paul and Neha Vyas of the Bank’s Environment Team moderated the discussions on EMPs.

The project director from Andhra Pradesh shared some of the problems they had experienced during the implementation of the project and cautioned that where two clauses conflict, the benefit would always go to the contractor/consultant. He also suggested:

- With regard to subcontracting problem an authorized subcontractor could be appointed to do EMP work.
- Congestion problems in urban areas had not been addressed.
- Detailed videography could be carried out in the pre-project report phase for use as a permanent record by all stakeholders throughout the project cycle.

Strengthening EMP/MoRTH provisions and improving compliance

The moderators led the discussion on how best to reflect technical specifications in the EMP keeping in mind that it was a tool to be used in a variety of contexts and situations but with one overarching objective. Some points that emerged:

- Main reasons for poor compliance of existing MoRTH provisions was lack of awareness and lack of clarity and focus in the provisions with regard to environment management on offsite operations.
- Incidentals should become distinct items on the BoQ thus making the activities/works priced and quantifiable. This would improve compliance.
- Suggestions were made to strengthen specifications and relate BoQ to these, rather than give too much detailing of activities (“smart specifications”)
- A lot depended on the integrity and commitment shown by engineering professionals at the site. Enforcement was often a matter of awareness and capacity.
- Local public could be effectively involved in compliance/enforcement.

EMP as a quality management tool

- It was suggested that recycling of waste material should come in a big way and example of successful practice in the Gujarat project was cited.
- A good EMP should incorporate an effective system of checks and balances from the beginning.
- Contractors could side step even BoQ items if they were comparatively small in terms of incentives. In such instances, public disclosure and involvement was cited as a useful tool. Mention was made of several instances where local people had moved court and persuaded contractors to take up proper mitigation activities.
- Operational intricacies under the EMP should be given in vernacular language to the contractor and even the local people for monitoring compliance. The use of simple pictorial depictions was also suggested to make understanding easy.
- The application of new technology and environment-friendly equipment (particularly hot mix plants/crushers) by contractors was debated. It was generally agreed that contractors should be asked to use the best equipment available (could be included even in qualification).
The use of advanced videography as a baseline survey and verification tool was discussed.

The moderator highlighted the importance of publicizing and sharing success stories on good practices, which were available in plenty in the country. Gujarat and Karnataka, particularly, had many good practices to share like their use of excavated material and innovative debris management. Some of the new states were very keen to learn and understand from the more experienced ones. Cross visits to projects and publicity material on success stories were important for this purpose.

- **Enhancing the capacity of the client**
  - There was strong need to have orientation in environment aspects for engineering professionals at the earliest stage before preparation.
  - Create a good database of successful professionals whose experience could be utilized in future projects (NHAI, it was suggested, should take the initiative).
  - Videographed material on successful projects can be used in training sessions for consultants/contractors.
  - Neha Vyas (WB) emphasized that ultimately the commitment and sincerity of the people on the ground mattered most for the best results. This was what perhaps explained the different outcomes on different sub-projects from the same PIU of a single client.

Concluding the discussion, Tapas Paul (World Bank) reminded the audience that EIA was a requirement of the Government of India and that EA process had to be seen in the context of integrating environment issues into project planning and design. The EA ToR was at best a tool to make the exercise productive and useful in the particular context of the client’s priorities. Even the generic EMP was only to be taken as an exhaustive guideline. The states had to modify and adapt the EMP according to their own priorities and policy. Recapitulating the main points that had emerged during day, he assured the participants that the Bank would take the initiative forward with more focused consultations.

**RECOMMENDATIONS/MAIN POINTS FOR FURTHER ACTION**

The main points/recommendations that emerged from the deliberations may be stated as follows:

**MODEL TO R FOR ENVIRONMENT ASSESSMENT:**

**Suggested Objectives / Principles to be kept in mind while drafting ToRs:**

- Upstream environment analyses in the project cycle so as to capture larger issues of development and environment relevant to the state.
- EA process should be given sufficient time during project preparation commensurate with the significance of anticipated impacts.
- Apart from providing mitigation measures for adverse impacts, EA must add value to engineering and final project design.
- Improve implementation effectiveness by considering suitability to local conditions.
• All stakeholders should understand the project as a common mission – ToRs should be tightened up so that everybody has a responsibility (this point should be reflected in engineering and IDS ToRs also).
• Consultants should be made responsible and liable for their work.

More details in ToRs to make it more effective
• Define depth of data collection.
• Surveys:
  o limited and specific surveys for screening need to be defined
  o data on underground utilities required
  o some data through regular Road Information System (RIS) may be useful
  o joint engineering and environment surveys needed to reduce duplication.

Required Outputs
EA process
• Local public who have vital knowledge of the area should be consulted as their inputs could improve both EA and engineering outputs.

EA & Engineering - Integration
• Contract documents be reviewed by the EA consultant with a view to ensuring that all items to be executed on the ground are included (bills of quantities, technical specifications) – as and when required.
• Additional technical specifications and rate analysis are needed for items not covered under existing documents.

Performance Monitoring
• Set detailed baseline parameters – may be measured after the project is implemented – before it is handed over to the PWD. This should be monitored for at least 5 years.
• Public disclosure and active involvement of local people can help monitoring on site.

Environment Management Capacity
• Counterpart Support:
  o Training of counterpart staff essential
  o Deployment of counterpart staff should be there for each consultant – and should be continued during implementation
  o More counterpart staff for project preparation needed
• Training of the designers/professional engineers required on environment issues.

Institutional Arrangements
• Make provision for State Level Committees to oversee interdepartmental co-ordination in place of MoU between project proponent and line departments.
GENERIC ENVIRONMENT MANAGEMENT PLAN

Harmonizing and strengthening EMP/MoRTH Provisions
- Reduce conflicts between the EMP and MoRTH specifications – and internal contradictions within the EMP clauses.
- Bulk of MoRTH provisions relating to environment management shown now as incidental to work should be made priced BoQ items.
- EMP needs to be made a part of contract and should be developed by a specialist.
- EMP should not be ambiguous and be exhaustive to the extent required.
- Training/orientation workshops are needed for professionals including contractors, supervision consultants, design engineers, etc.

Capacity building and monitoring
- Case studies of successful good practices available across the country need publicity and sharing. These could be documented briefly and disseminated.
- Many more experience sharing opportunities/forums are needed.
- A database of professionals (consultants & contractors) as also a rating system may be created (preferably by NHAI) to help new project proponents.
- Operational details affecting local residents/land owners should be publicized in the vernacular language as a public communication.
- Public disclosure and participation could be a useful tool in monitoring.

What more is needed
- Exposure visits are vital; also useful would be taking lessons from global experience, training sessions, and dissemination of materials (success stories).
- Parallel with road safety issues – awareness - raising (including training) needed.
- Development of an e-group for sharing information of common interest to all participants.
- Codes of practice for environmental issues have to be developed.
- Greater involvement of Government agencies in addition to PWD required.

George Tharakan, from the World Bank, in his concluding remarks stressed on the need for compliance and the Bank’s obligation to follow its operational policies on environmental safeguards in Bank funded projects. He asked the participants to be vigilant in matters of enforcement and encouraged them to take up matters directly with Bank supervision missions if the situation so warranted. The Secretary IRC fully endorsed the need to protect the environment at all costs in development projects. He assured the gathering that IRC was organizing workshops across the country to reduce problem areas in the implementation of road projects, and that IRC was willing to collaborate in any initiative particularly on environment and safety issues. The deliberations concluded with a vote of thanks by Ms. Sonia Sandhu.