Regulating and Monitoring Capacity Building for
Environmental Impact Assessment (EIA) of
Hydropower Project in Nepal

A Guide to
Environmental Management Plan of Hydropower Projects

Government of Nepal
Ministry of Environment, Science and Technology
With the assistance of
Royal Norwegian Government
and technical assistance of
Norwegian Directorate for Nature Management
Kathmandu, Nepal
September 2006

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Peface

Integration of environmental aspects into development programmes and projects has been a part and parcel of environmental management. In Nepal, this integration has been ensured through environmental assessment - commonly understood as a planning and management tool for the last 25 years. A number of policies and legislations are in place to make the development proposals environment-friendly and sustainable and make effective use of this tool.

After the enforcement of the Environment Protection Act, 1996 and its Rules, 1997, the preparation and implementation of the Environmental Management Plan (EMP) has been an integral part of the Environmental Impact Assessment (EIA) report. The Plan provides guidance to implement the benefits enhancement measures and adverse impacts mitigation measures along with the conduction of the environmental monitoring and auditing.

The Ministry of Environment, Science and Technology (MoEST) has undertaken necessary steps to improve the quality of EIA report and facilitate for its effective implementation. In this venture, the Ministry has developed this EMP Guide to encourage the project proponent and investors to understand about its essential components and to prepare and submit a practical and implementable management plan as a part of EIA report. This Guide has been developed as a part of the project on *Regulating and Monitoring Capacity Building for EIA of hydropower projects in Nepal*. The Project has been implemented with the generous financial assistance of the Royal Norwegian Government and technical inputs of the Norwegian Directorate for Nature Management.

I take this opportunity to appreciate the contribution of the Royal Norwegian Government for the implementation of the above-mentioned project. I would also like to thank the Directorate for Nature Management for providing technical assistance while implementing the project. The Ministry acknowledges the contribution of the School of Environmental Management and Sustainable Management (SchEMS) in particular Messrs. Ananda Raj Joshi and Suman Piya for developing this guide on behalf of SchEMS.

I would also like to thank Mr. Vinod Jnawali, Joint-Secretary, Mr. Manohar Khanal, Under-Secretary and Ms. Neera Pradhan of the then Ministry of Population and Environment and Mr. Reider Hindrum, Long-Term Advisor of the Project for their inputs during the preparation of this guide. Thanks are due to Prof. Riki Therivel, Dr. Ram. B. Khadka and Mr. Bhairaja Manandhar for providing relevant materials to the study team and reviewing the draft guide during its preparation by SchEMS. The Steering Committee members and the participants of this document finalization workshop are also acknowledged for their valuable inputs. At the end, I am pleased to record the contribution of Mr. Batu Krishna Uprety, Environment Officer and Chief of Environment Assessment Section of this Ministry for bringing this guide in the present form.

(Bal Krishna Prasai)
Secretary

September 2006

Contents

Acronyms

ADB	Asian Development Bank
CBO	Community-Based Organization
DDC	District Development Committee
DOED	Department of Electricity Development
EA	Environment Assessment
EIA	Environmental Impact Assessment
EMAP	Environmental Management Action Plan
EMP	Environment Management Plan
EMU	Environment Monitoring Unit
EPR	Environment Protection Rules
GoN	Government of Nepal
HEP	Hydroelectricity Project
HMG	His Majesty's Government (then)
IEE	Initial Environmental Examination
MoEST	Ministry of Environment, Science and Technology
MOPE	Ministry of Population and Environment (then)
MOWR	Ministry of Water Resources
NGO	Non-Governmental Organization
RAP	Resettlement Action Plan
TOR	Terms of Reference
VDC	Village Development Committee
WB	World Bank

INTRODUCTION

An Environmental Management Plan (EMP) is a part of Environmental Impact Assessment (EIA) report. The purpose of EIA is to identify, predict and evaluate impacts of the project on the environment and to formulate mitigation strategies to minimize adverse impacts that are likely to occur during project implementation and operation. In the process of EIA, the formulation and implementation of an EMP lays the framework for continued assessment of potential impacts through the application of monitoring and auditing.

An EMP is often integrated directly into an EIA report of hydropower projects but it may vary greatly in size and content. Sometimes a developer may regard EMP simply as a legal requirement in the licensing process and make it brief. On the other hand, a developer may produce a detailed plan for the implementation of environment protection measures (benefit augmentation, and adverse impacts mitigation measures), and monitoring requirements by incorporating them in EIA report.

Upon the cursory look on EMP requirements of Asian Development Banks (ADB) and World Bank (Annex 1), EMP includes impacts mitigation, monitoring, auditing, and institutional set-up for its implementation. The practice in Nepal includes monitoring and auditing only in some projects (Annex 2). But for the present purpose in this guide, EMP contains plan for the implementation of adverse impacts mitigation measures, monitoring, auditing and project management although mitigation plan, monitoring and auditing requirements are sometimes included as separate chapters as per EPR, 1997.

In order to consolidate major ingredients of the management aspects in an EMP it is, therefore, of utmost importance that the formulation and implementation of EMP should, as far as possible, be cost effective, practical and accurate. Thus, the principle objective of this document is to guide the developer, whether public or private, to ensure that all environment protection measures and monitoring and auditing requirements as recommended in the EIA are implemented and to provide a basis for examining whether such measures implemented are effective.

1.1 Environmental Impact Assessment in Nepal

Since the enforcement of EPA, 1996 and EPR, 1997, EIA is required to implement projects included in Schedule 2 of EPR, 1997. Each project under consideration is screened to determine whether it should undergo an Initial Environmental Examination (IEE) or EIA process. The proposals requiring IEE or EIA are prescribed in Schedules 1 and 2 of the EPR, 1997.

An IEE is relatively a simple procedure. IEE does not undergo scoping process. A list of anticipated impacts and corresponding mitigation measures to be implemented are the end results of an IEE study. However, if the project has to undergo the EIA process, a series of steps are required to be undertaken at different stages of the project cycle. The EIA process includes scoping, public involvement (participation and consultation), impact identification, prediction and evaluation, analysis of alternatives, selection of impact-based environment protection measures (EPMs), and an EMP. EMP includes plan for the implementation of EPMs, environmental monitoring and auditing.

Three major decisions are taken during EIA preparation and implementation. They are as follows:

1. The Scoping study should be made during the project feasibility period. Based on the output of the Scoping exercise, a Terms of Reference (TOR) should be prepared. According to EPR, 1997 (amendment 1999), both of these documents are submitted to the Ministry of Environment, Science and Technology (MoEST) for approval, after review by the Department of Electricity Development (DOED) and the Ministry of Water Resources (MOWR) in case of proposals related to hydropower sector.

2. Based on the approved TOR, the developer completes an EIA Study of the concerned proposal, and submits it to MOWR through DOED. After a review, MOWR submits it to MoEST. Approval of the EIA report might include conditions that must comply with during the project implementation (pre-construction, construction and operational stages).

3. Implementation of EMP takes place during the project construction phase. Environmental Monitoring is part of EMP and continues over the entire project cycle. MoEST might issue decisions at different stages of the project cycle, based on an examination of the information obtained. An environmental audit is carried out by MoEST after the project has been in operation for two years in order to examine whether everything has gone as intended and predicted.

ENVIRONMENTAL MANAGEMENT PLAN

2.1 Definition of an EMP

In general, EMP is a structured way of working with the issues in a planned way. In any case, the plan should address: (i) what to implement? (ii) when to implement? where to implement? what method to be employed? and who to implement? To date, lack of specific guidelines is a major obstacle for the preparation and proper implementation of EMP in Nepal.

Since an EMP includes project management, monitoring and auditing, it is most appropriate to provide some introduction to the types of monitoring and auditing which is considered during EMP preparation, and should be conducted during project implementation.

2.2 Objective of an EMP

The key objectives of an EMP are to:

- Formulate project management activities in particular the implementation of EPMs;
- Formulate a monitoring programme for baseline, impact and compliance monitoring; and
- Formulate an environmental auditing programme to be implemented after project construction.

2.3 Appropriate Time for EMP Implementation

The initial formulation of an EMP should be carried out in the process of EIA preparation during the feasibility study of the project cycle. The subsequent implementation of an EMP should be carried out during project construction and operation.

2.4 Need for EMP Guide

EPR, 1997 requires an EMP to be included in the EIA report. EPR, however, does not set out the details or the contents of an EMP. This has caused the EIA reports to vary significantly both in format and contents of EMP. The need for a guide for preparing an EMP has been felt for long by the reviewers, EIA practitioners and professionals and at decision-making level. The main purpose of preparing this EMP Guide is to fulfil this long-felt need and thereby to provide clear guidance hat will assist in preparing a reasonably consistent and concise EMP.

A broad framework of monitoring and auditing to be executed is necessary in order to achieve the effective implementation of an EMP during project construction. The prescribed mitigation measures may not always be effective. Therefore, a series of alternative techniques and a combination of several techniques should be provided so that the proponent has choices in employing different methods. The selection of these techniques will depend upon the availability of time, financial and human resources.

2.5 Responsibility for EMP Formulation and Implementation

As per EPR, 1997, the proponent should prepare EMP as a part of EIA Report. The approving agency should examine the EMP included in the EIA report, keeping in view of cost-effectiveness and practicability upon its application. The approving agency might make necessary decision for the implementation of an EMP.

PREPARATION OF ENVIRONMENTAL MANAGEMENT PLAN

As defined previously, an EMP should invariably constitute: (i) project management component in particular EPMs implementation, (ii) monitoring programme, (iii) audit programme, and (iv) cost for implementation of mitigation measures, monitoring and auditing programmes.

3.1 Project Management

Different agencies involved directly and indirectly for environmental management of the proposal are:

1. MoEST,
2. Concerned Ministries,
3. Concerned Departments,
4. Project Proponents,
5. Supervising Engineers,
6. Construction Contractor,
7. Local-level political and governmental institutions and local bodies such as Village Development Committee (VDC), municipality and District Development Committee (DDC); and
8. Local-level NGOs, Community-Based Organizations (CBOs).

3.1.1 Roles and Responsibilities

The main roles and responsibilities of the different agencies at different stages of project implementation phases are:

Pre-construction Phase

A. Ministry Environment, Science and Technology

1. Review of EIA report to ensure that the report is prepared as per EPA, 1996 and EPR, 1997, approved TOR;
2. Approval of EIA report with or without conditions which might include design change, change in location, or incorporation of additional mitigation measures and monitoring requirements to minimize the environmental impacts;
3. Instructions for proponent in the approval letter to: (i) ensure that mitigation and monitoring provisions are incorporated in the design and tender documents and are implemented during project construction and operation stages; (ii) examine environmental monitoring report submitted through the concerned ministry; and (iii) any other environmental requirement to be compiled with various phases of the project implementation and operation.

B. Project Proponent

1. Review of EIA report to ensure that it meets the EIA requirements and procedures as per EPA, 1996 and EPR 1997, and other environment-related acts, rules and guidelines administered by concerned agencies;
2. Submission of final EIA report to the concerned ministry for review and to MoEST for approval;
3. Approval from MoEST;
4. Review of final design and tender documents to ensure that all recommendations of the approved EIA report are incorporated in the final design, project documents, and tender documents;

5. Establishment of inter-agency co-ordination mechanism and field office:
6. Establishment of stakeholders' advisory committee, and dissemination of project information regularly as necessary,
7. Carry out activities such as: (i) get approval of government-owned, and private-owned land and property acquisition; (ii) consultation and notification with related stakeholders; (iii) acquisition and compensation; and (iv) preparation of tender documents and award of the construction contract.

C. Supervising Engineers (Appointed by Project Proponent)

1. Elaborate EMP, if necessary, with cost for the contracted component or sub-component as per component requirement on: (i) environmental awareness and skill development of workers, particularly of Severely Project Affected Families; (ii) workforce camps, other construction work sites; (iii) road and tunnel spoils; (iv) camp wastes; (v) management of explosives and toxic wastes; (vi) risk and hazard; (vii) erosion control and sedimentation; (viii) topsoil saving and reuse; (ix) quarry mining; (x) accident and emergency works; (xi) storage and stockpiling; (xii) reinstatement of services and facilities (xiii) rehabilitation works; (xiv) vegetation and wildlife conservation and enhancement; and (xv) community relation. The elaborated EMP should be submitted to project proponent for final approval.
2. Assist field engineers on the site inspection before approval of detail EMP, and also its implementation.

D. Local Bodies, NGOs and CBOs

1. Ensure that transparency of the project planning activities are maintained;
2. Ensure that land acquisition, compensation, resettlement and rehabilitation have been carried out as per approved EIA report and existing laws; and
3. Ensure that the local level grievances are adequately addressed.

Construction Phase

Various agencies are responsible for the review of following project construction activities:

A. MoEST and MOWR

(i) review of periodic monitoring report including compliances; (ii) review of effectiveness of enhancement and mitigation measures; and (iii) taking of necessary actions in case of non-compliance.

The proponent with the help of the supervising engineers and contractors should facilitate the implementation of EMP and carryout periodic monitoring activities and produce periodic reports for submission to the concerned ministries and MoEST for information and review.

B. Supervising Engineers

1. Regular training to project staff on the environmental monitoring and preparation of monitoring report formats, inspection formats etc;
2. Preparation of monitoring reports as mentioned in EMP with a list of compliance and non-compliance works with recommendations;
3. Site inspection of construction works quarterly to provide feedbacks;
4. Daily, weekly and monthly monitoring of contractors' performance on meeting the provisions of tender documents, and EMP;

5. Monitoring of the effectiveness of enhancement and mitigation measures;
6. Recommendations for necessary actions for non-compliance of the works as per tender documents and EMP; and
7. Participation on the site inspections and monitoring carried out by the concerned agency.

C. Construction Contractors

1. Seek a prior approval from the supervising consultants to start construction works;
2. Ensure that all preparatory works are carried out as per the tender document;
3. Ensure that the priority in the employment is given to local people as per their skills and capabilities in the project works; and
4. Carry out all corrective actions or other instructions as given by the supervising engineers.

D. Local Bodies, NGO and CBOs

1. Ensure that transparency in the construction activities are maintained throughout the construction period;
2. Ensure that the environmental enhancement and mitigation measures and monitoring is carried out as per approved EIA report;
3. Ensure that the priority to local-level employment, regular participation meetings, involvement of VDCs, NGOs, and CBOs in the project implementation have been met as per EMP of EIA report; and
4. Ensure that local grievances are timely and adequately addressed.

Operational Phase

A. MoEST and MOWR

1. Review of the bi-annual monitoring reports for compliance and effectiveness of EPMs; and
2. Continuation of monitoring activities also from the concerned ministry; and
3. Conduction of environmental auditing after two years of project service.

3.2 Monitoring Programme

It is an integral part of EMP and it is employed to measure the effectiveness of environmental enhancement and mitigation measures implemented. The environmental monitoring is essential for:

- Ensuring that the impacts do not exceed the established standards,
- Checking the implementation of enhancement and mitigation measures in the manner described in the EIA report, and
- Providing an early warning of potential environmental damage.

According to EPR, 1997, the concerned body i.e. the Ministry of Water Resources, in case of water resources proposals, shall monitor and evaluate the impact of project implementation on the environment. The proponent will be responsible for in-built monitoring activities. However, MoEST, Ministry of Forests and Soil Conservation and other relevant agencies should also be involved and consulted during the monitoring.

3.2.1 Types of Monitoring

The following types of monitoring activities should be carried out during the project construction and operation:

A. Baseline Monitoring

If the anticipated time lapse between the EIA report approval and the commencement of project implementation is more than 5 years, in general, EIA report should suggest a baseline monitoring just before the project implementation. The main objective of such a monitoring would be to update the baseline information on the overall environmental conditions of the project implementation site/ area. Baseline monitoring should cover physical, chemical, biological, socio-economic and cultural aspects in line with the approved EIA report and associated sampling methods along with location and frequency.

EMP should also clearly indicate the responsible agency to carry out such a monitoring since a *monitoring unit* should be constituted and be functional during the actual project implementation.

Based on the updated baseline condition of the project site/area, if the need for the revision of the impact identification and prediction and subsequently modification/additions in the already recommended enhancement and mitigation measures arise, such modification/ additions should be incorporated in the approved EIA report and the subsequent documents should be sent to the concerned ministry and MoEST.

B. Compliance Monitoring

The main objective of compliance monitoring is to ensure that all conditions set-forth and commitments made in the EIA report and other applicable regulatory requirements and standards are well integrated with subsequent project documents e.g. detailed engineering design and tender document etc., and they are actually fulfilled or complied with in practice. This will greatly help in for future legal actions that might be taken in the event of any non-compliance resulting in damages.

EMP should clearly list down all conditions and other applicable regulatory requirements and standards that need to be compiled with by the proponent prior to and during the project implementation. It should also give instructions to the agency(ies) responsible for carrying out compliance monitoring.

C. Impact Monitoring

EMP should clearly set out the parameters/indicators to be monitored during project implementation and associated sampling methods along with location, frequency and responsible agencies.

The main objectives of impact monitoring would be to: (i) ensure that the actual impacts in the field are really within the manageable limit of the designed mitigation measures; and (ii) detect any unexpected damages and thereby provide early warning to the responsible agencies for undertaking corrective and additional measures to avert, if possible, or minimize the risks of such unanticipated impacts.

3.2.2 Reporting Requirement

An EMP should prescribe a practical reporting mechanism along with necessary formats to collect data and document the findings of monitoring activities and the proofs of compliance and/or non-compliance.

3.2.3 Institutional Arrangement

An EMP should suggest an organizational set-up such as establishment of an *Environmental Monitoring Unit* (EMU) which will have the overall responsibility of monitoring and reporting.

The organizational structure and staffing for EMU should be clear with collaborative mechanism with concerned agencies that will have key roles to play in the overall environmental monitoring of the project implementation and operation. Clear inter-linkages among all the involved agencies in terms of reporting responsibilities should as well be indicated in the institutional set-up.

EMP should also provide cost estimate for carrying out baseline, compliance and impact monitoring along with the responsible agency to fund them. Based on the need assessment, such a cost estimate may also cover training and/or capacity-building requirements of EMU.

The cost estimates for non-structural measures, monitoring and reporting activities should be accompanied by a detailed breakdown. It should then summarize the costs of monitoring and reporting activities.

For detailed information for monitoring programme, it is advised to refer the Environmental Monitoring Guide produced as a part of this Project.

3.3 Environmental Auditing

3.3.1 Principles of Auditing

The term "Audit" is usually associated with the profession of finance and accounting. Auditing refers to the examination and assessment of a certain type of performance. In case of an EIA, an audit should assess the actual environmental impacts, the accuracy of prediction, the effectiveness of impact mitigation and enhancement measures, and the functioning of monitoring mechanisms. As per EPR, 1997, audit should be undertaken after two years of commencement of service from the proposal. It is usually performed once for each project. The auditing should be carried out by MoEST as per Rule 14 of the EPR, 1997.

3.3.2 Types of Audit

The following types of environmental audit might be carried out depending upon the nature and location of the project:

a) **Decision Point Audit:** It examines the effectiveness of EIA as decision-aiding tool.

b) **Implementation Audit:** It ensures that consent conditions have been met.

c) **Performance Audit:** It examines the effectiveness of project implementation and management.

d) **Project Impact Audit:** It examines environmental changes arising from project implementation.

e) **Predictive Technique Audit:** It examines the accuracy and utility of predictive techniques by comprising actual against predicted environmental impacts.

f) **EIA Procedures Audit:** It critically examines the methods and approaches adopted during the EIA Study.

All audits are not required in all cases. At the project approval stage, however, both the project proponent and the authorizing agency should consider whether the application of a particular auditing technique is likely to result in new information or an improvement in management practice. Particular attention should be given to the cost-effectiveness of any proposed audit and to the technical difficulties likely to be encountered.

Since EIA concept is relatively new to Nepal, usage of environmental audits will play a significant role in evolving a systematic approach to the application of EIA, and know the effectiveness of the environmental enhancement and mitigation measures.

Environmental auditing should compare monitoring results with data generated during the pre-project period. Comparisons can be made with similar projects or against standard norms. Relating actual impacts with predicted impacts will help in evaluating the accuracy and adequacy of EIA predictions.

3.3.3 Intensity of Auditing

As per EPR, 1997, environmental auditing should take place one time after two years of the commencement of service of the proposal. Not all the parameters considered at monitoring stage are required to be audited. Therefore, most significant parameters reflecting environmental and social aspects of the projects implementation should be taken into consideration. This process of "boiling down" to important parameters for auditing can be determined by scoping.

3.3.4 Development of Auditing Plan

Auditing should be done in close cooperation with other relevant agencies, concerned and affected parties, and the project proponent. However, the project proponent can also carry out auditing of the projects to assess the impacts of the project. It will provide additional benefits to the proponent for making the project environment-friendly and sustainable.

The audit is a crucial stage of project implementation because it may indicate a need to improve the project implementation in order to reduce or prevent unwanted consequences. The audit requires the involvement of a multi-disciplinary team of experts including government officials, the proponent and the representative of the local people. The duration of the audit study might be as short as one month or as long as six months depending upon the nature, sensitivity and location of the project. A protocol/ work plan can be developed before auditing work. The study team should review the EIA report, and monitoring results before starting the auditing work.

3.3.5 Auditing Procedures

Data and information of EIA report and monitoring output needs to be utilized in environmental audit. In general terms, the environmental audit should gather information on the following areas:

- Condition of natural, social and economic resources prior to and after project construction;
- Whether the impacts forecasted by EIA study occurred and, if so, the extent of these impacts;
- Whether or not enhancement and mitigation measures implemented are effective to enhance beneficial impacts and control adverse impacts respectively;
- Whether or not landscapes degraded due to project implementation have been restored to their original (or better) conditions;
- What are the impacts of boom-bust scenario among the workforce involved in project implementation and the local economy; and
- Overall effect on the local economy from the project implementation.

Specially, the following activities, and others as deemed necessary, need to be addressed during environmental auditing: However, activities should be selected taking into consideration the nature of the project, baseline condition, impacts evaluated during the EIA, and monitoring results.

- How have the environmental conditions changed from the baseline conditions?
- Are there problems related to slope stability in the project area?
- Have slope stability and erosion control measures adopted by the project been effective in minimizing slope instability, erosion, and landslide?
- What is the quality of water in the river and its tributaries? Did it change significantly as compared to the baseline condition?
- Are there any bare or degraded areas around the project? What is the condition of the quarry sites, borrow areas, and spoil disposal areas?
- How are the local forest users groups functioning?
- What is the condition of local forests?
- How are the families resettled by the project adapting to their new host communities?

- How has local construction workers adapted to the loss of their jobs following the end of construction activities?
- What is the attitude of the local people towards the project?
- What has been the impact of the project on local and national economy and natural resource base?

For more information, a Guide to Environmental Auditing may be referred.

3.4 Cost for EMP implementation

An EMP should compulsorily present a summary of all evaluated impacts (identified and predicted impacts) along with their respective enhancement and mitigation measures. The mitigation measures should be classified into two basic categories: (i) Structural, and (ii) Non-structural. Structural measures are those, which need to be designed and cost estimation should be made during the detailed engineering design. For such measures, indicative cost estimates may be presented in the EMP. The non-structural measures are those that do not need structural design and hence cost estimates could be made right during the EIA study, prior to the detailed engineering design.

A total cost for EMP implementation should be classified on the basis of project scale and the types of impacts that the project implementation activities are likely to generate. If required, cost for resettlement, rehabilitation and relocation should be estimated and included in EIA report. The costs for mitigating impacts on physical, biological and socio-economic and cultural aspects should be estimated. Additionally, the cost for implementing monitoring programmes and audit, which should be carried out after two years of project operation should be estimated. As mentioned earlier, most of the structural mitigation measures do not need an allocation of separate budget. However, for non-structural mitigation activities such as training, environmental administration, project management, environmental enhancement programme, social upliftment and income generating and skill development programmes, etc., an allocation of separate funding is required, and should be presented in EIA report under EMP chapter.

Impact-based environmental enhancement and mitigation measures should be selected taking into consideration the site condition. Cost for the implementation of the environment protection measures, environmental monitoring and auditing and for necessary equipment and reporting should be clearly mentioned in the EMP chapter of the EIA report. Based on the present level of information, EMP cost might be less than 5 percent of the total project cost. It would be appropriate to compare the EMP cost with the total project cost and include in the EIA report.

Review of EMP Requirement of Asian Development Bank and World Bank

Asian Development Bank (ADB) EA Guidelines

The guidelines of the Asian Development Bank on environmental assessment (EA) emphasize on the following contents for an EMP.

The minimum contents of an EMP that should be included in EIA or IEE (for Category B Project deemed environmentally sensitive) report, are described below:

1. **Summary of Impacts:** To summarize the predicted adverse environmental and social impacts that must be mitigated.

2. **Description of Proposed Mitigation Measures:** To set out clear and achievable targets and quantitative indicators of the level of mitigation required; to include brief description of each measure in relation to the impact and conditions under which it is required along with specific reference to designs, development activities, equipment description, and operating procedures and implementation responsibilities.

3. **Description of Monitoring Programmes and Parameters:** To outline the specific monitoring protocols, parameters, and expected frequencies; to spell out the identified objectives and specified type of monitoring required; to describe environmental performance indicators which provide linkages between impacts and mitigation measures identified in the EIA/IEE report – parameters to be measured, methods to be used, sampling location and frequency of measurements, detection limits and definition of thresholds to signal the need for corrective actions.

4. **Public Consultation Activities:** To chalk out a plan for public consultation activities during the finalization and implementation of EMP, the degree of consultation depending on the project and local situation, but normally including: (i) notification for local communities when project activities are going to take place; (ii) disclosure of the results of monitoring programs to local communities and other stakeholders; and (iii) provision for independent third party monitoring, where necessary. Projects with potential for significant adverse impacts may require public consultation on the design of mitigation measures and provision for public participation in environmental monitoring.

   Stakeholder consultation is also recommended during the preparation of final monitoring reports.

5. **Description of the Responsibilities for Mitigation and Monitoring Requirements:** To specify the institutional arrangements for implementation with due regards to the local conditions, and to define organizational and individual responsibilities for mitigation and monitoring along with arrangements for information flow, and for coordination amongst agencies responsible for mitigation.

6. **Preliminary Cost Estimates:** To set out a preliminary cost estimates to ensure adequate funding required for mitigation measures and monitoring.

World Bank EA Guidelines

The World Bank Environmental Assessment Guidelines sets out the following contents for an EMP:

1. **Mitigation**: To identify and summarize all the anticipated significant adverse environmental impacts, including involvement of indigenous people or involuntary resettlement; and to describe each compensatory and mitigation measures with technical details such as types of impact related to conditions under which they are required, their design, description of equipment associated and operating procedures as appropriate. It is necessary to list impact based measures and define linkage with other mitigation plan required for the project.

2. **Monitoring**: To identify monitoring objectives and specify the type of monitoring, with linkage to the impacts assessed in the EA Report and the mitigation measures described in the EMP; to provide information particularly on the environmental impacts of the project and the effectiveness of mitigation measures, which enables borrower and the bank to evaluate the success of mitigation as a part of project supervision, and allows corrective actions to be taken when needed. Specifically, the monitoring section of the EMP should provide:

   (a) a specific description, and technical details, of monitoring measures, including the parameters to be measured, methods to be used, sampling locations, frequency of measurement, detection limits (where appropriate), and definition of thresholds that will signal the need for corrective action; and

   (b) monitoring and reporting procedures to: (i) ensure early detection of conditions that necessitate particular mitigation measures; and (ii) furnish information on the progress and result of mitigation.

3. **Capacity Development and Training**: To specifically set out the institutional arrangements required for carrying out mitigation measures and monitoring (e.g., responsibilities for operation, supervision, enforcement, monitoring of implementation, remedial action, financing, reporting, and staff training); and to additionally provide descriptions of: (a) technical assistance program; (b) procurement of equipment and supplies; and/or (c) organizational changes, aimed at strengthening environmental management capability of the agencies responsible for implementation.

4. **Implementation Schedule and Cost Estimates**: To provide: (a) an implementation schedule for measures that must be carried out as a part of the project, showing phasing and coordination with overall project implementation plans; (b) the capital and recurrent cost estimates to be integrated into the total project cost; and to indicate sources of funds for implementing the EMP.

5. **Integration of EMP with Project:** To assure that EMP is specific in its description of the mitigation measures and monitoring and its assignment of institutional responsibilities; and will also be integrated into the project's overall planning, design, budgeting, and implementation. Information obtained from the review of big and medium-sized hydropower projects, guidelines form World Bank and Asian Development Bank are the basis for developing guidelines, however, while drafting guidelines, special attention has to be paid to their *simplicity* and *workability*.

Review of EMP of EIA Reports of some Hydropower Projects

Most EIA reports related to hydropower projects or others contain a chapter on EMP as per the requirement of EPR, 1997. However, contents are only concentrated on monitoring and auditing activities. In some cases, for example, EIA report of Middle Marsyangdi Hydropower Project, and in West Seti Hydropower Project have Environmental Management Action Plan (EMAP) supplementing the EMP. However, in most of the EIA reports of hydropower project, EMP has been categorized to include:

- monitoring programme;
- auditing programme;
- project management; and
- cost for implementation of project management, monitoring and auditing.

The Middle Marsyangdi, West Seti and Upper Modi "A" Hydropower Projects have provided EMP in the form of Environmental Management Action Plan (EMAP) and have included the following topics each of which has been discussed under the following topics:

A. Middle Marsyangdi HEP

Review of the EIA report of the Middle Marsyangdi Hydroelectric Project shows the main topics and the relative sub-topics as follows:

1. *Project's description*: Project location, project components, project implementation programme
2. *Statutory requirements*: Environmental legislation, environmental standards and environmental permits and approvals
3. *Implementation of EMAP*: Management plan structure, environmental management roles and responsibilities
4. *Environmental management during project design*: Final design, accommodation of environmental management clauses in the condition of contract
5. *Environmental management during project development*: Pre-construction phase, construction phase and post-construction phase
6. *Environmental management during project operation*: Aquatic environment, river bed erosion, hydrology, reservoir foreshore stability, buffer zone, water quality, training and hazards
7. *Site supervision, environmental monitoring and auditing*: Site supervision, environmental monitoring
8. *Environmental improvement and enhancement programs*: Training, community development, and environmental improvement programmes
9. *Records, audits and corrective actions*: Records, site audits, corrective actions, compliance handling procedures, emergency response plan and procedures, incident handling procedures, and compensation responsibilities

B. West Seti Hydroelectric Project

Similarly, review of EIA report of the West Seti Hydroelectric Project includes the main topics and relative sub-topics as:

1. *Introduction:* Purpose, aims, contents, and update of EMAP
2. *Project description:* Location, project components, project programme
3. *Statutory requirements:* Environmental legislative framework, environmental permits and approvals

4. *Implementation of EMAP:* Environmental management structure, environmental responsibilities, inter-governmental participation, and community participation
5. *Environmental management during project design:* Preliminary design, additional studies, plans, and final design
6. *Environmental management during project construction:* Pre-construction, construction, and post-construction phases
7. *Environmental management during project operation:* River hydrology, river-bed degradation, reservoir foreshore stability, water quality, aquatic ecology, hazards, and workforce safety
8. *Environmental improvements:* Water supply and sanitation, rural electrification, community forestry, fish hatchery establishment, other researches and conservation, and other community development initiatives
9. *Site supervision and monitoring:* Site supervision, and environmental monitoring
10. *Records, audits and correctives actions:* Records, site audits, corrective actions, incident management procedures, emergency management procedures, and complaint handling procedures

C. Upper Modi "A" Hydroelectric Project

The EIA report of Upper Modi "A" Hydroelectric Project contains relatively less topics and sub-topics in EMP, which are as follows:

1. *Concept:* The management concept regarding the planning, organisation, staffing, directive, coordination, reporting and budgeting
2. *Planning:* Implementation plan for mitigation measures, environmental monitoring, monitoring parameters, monitoring locations, schedules and responsibilities, and environmental auditing
3. *Organization and staffing:* Organisation and staff required for the implementation of the plan
4. *Directives and Coordination:* Necessary directives and coordination mechanisms required for the implementation of the plan
5. *Reporting requirements:* Intervals of reporting of monitoring activities
6. *Budget for EMP implementation:* Estimated budget for benefit augmentation and mitigation measures, environmental monitoring, environmental auditing, and comparison with the projects' total cost.

Workshop on EMP Guide

1. Introduction

The then Ministry of Population and Environment (MOPE) and Norwegian Directorate for Nature Management entrusted School of Environmental Management and Sustainable Development (SchEMS) to develop this Guide to Environmental Management Plan (EMP).

Guests and participants interacting in the workshop

The Guide was developed and was field-tested in Khimti Hydropower Project. The Guide was discussed with the representatives from various sectors (Annex 4). The workshop was organised on 10 October 2004 at SchEMS Hall, Shantinagar, New Baneshwor.

2. The Finalization Workshop

Prior to the workshop, the draft guide was sent to the participant to offer them opportunity to read it thoroughly.

In the workshop, held on 10 October 2004, Mr. Vinod Jnawali, Joint Secretary of Environmental Division of then MOPE chaired the session. Mr. Reider Hiudrum, Long-Term Advisor of EIA Capacity Building Project at MOPE/DN was invited as guest. An overview of draft Guide for EMP was presented in the workshop, followed by discussion. The following were the major comments and suggestions for improvement.

- Cover photograph should be of Nepalese context;
- Clarification on the inclusion on EMP;
- No need of mentioning of amendment of EPR, 1997;
- Inclusion of mitigation measures in EMP is misleading;
- Include the role of ministries in project management;
- Auditing plan should be briefly touched upon; and
- In EMP implementation cost, provide the range.

Discussions taking place in the workshop

3. Participants in the workshop

At the end of the workshop, Mr. Vinod Jnawali concluded that the Guide is a new start. It is important for EIA process and EPR, 1997 also requires undertaking about EMP; however, EPR does not provide a framework on how to carry out audit of the development project. Therefore, EMP provides a clear-cut framework and clarifies its importance. So it has eased the process of integrating EMP in EIA report preparation and also for implementation. He finally concluded that the comments and suggestions provided by the workshop participants are very appropriate and advised SchEMS to include the relevant suggestions. Mr. Jnawali thanked DN for assisting in the implementation of this project.

Participants from various agencies interacting in the workshop

List of Participants Attending the Workshop

Date: 10 October 2004
Time: 11:00 AM

	Name	Designation	Organization
1.	Vinod Jnawali	Joint-Secretary	MOPE
2.	Damodar P. Parajuli, Ph.D.	Joint Secretary	MFSC
3.	Manohar Khanal	Under-Secretary	MOPE
4.	Reider Hindrum	Long-Term Advisor	MOPE/DN
5.	Neera Pradhan (Mrs.)	Ecologist	MOPE
6.	Bhai Raja Manandhar	Engineer	MOPE
7.	Meera Joshi (Mrs.)	Engineer	MOPE
8.	Pravin Aryal	Senior Divisional Engineer	MOWR
9.	Bishnu B. Singh	Senior Divisional Engineer	DOED
10.	Sudesh Malla	Senior Divisional Engineer	DOED
11.	Dilip Sadaula	Geologist	DOED
12.	Bishnu Shrestha, Ph.D.		DOR
13.	Sugam Shrestha	Programme Officer	IUCN

Note:

MOPE = then Ministry of Population and Environment
MOWR = Ministry of Water Resources
DOED = Department of Electricity Development
MFSC = Ministry of Forests and Soil Conservation
DOR = Department of Roads
IUCN = The World Conservation Union