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

A Guide to
Environmental Auditing 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

Environmental auditing (EA) is an emerging area of concern in Nepal and helps to understand environmental performance of the proponent and stakeholders involved in implementing the development project. EA provides useful information about the state of the environment on pre-project and post-construction stage in a given area. The auditing information also provides a basis to select environmental protection measures to address environmental problems of similar nature in similar ecosystem and may contribute to the improvement of environmental conditions.

The Environment Protection Act, 1996 and its Rules, 1997 urge to conduct environmental auditing after two years of service provided by the project. The Ministry of Environment, Science and Technology (MoEST) has undertaken necessary steps to expedite environmental auditing in the recent days and I believe that this guide will streamline this initiative. 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 is being implemented with the generous financial assistance of the Royal Norwegian Government and technical inputs of the Norwegian Directorate for Nature Management.

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September 2006

(Bal Krishna Prasai)
Secretary

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Annexes

Acronyms

ACRP	Acquisition, Compensation and Rehabilitation Plan
ADB	Asian Development Bank
BOD	Biological Oxygen Demand
COD	Chemical Oxygen Demand
DN	Norwegian Directorate for Nature Management
DO	Dissolved Oxygen
DOED	Department of Electricity Development
EA	Environmental Assessment
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPA	Environment Protection Act
EPR	Environment Protection Rules
ESSD	Environmental and Social Studies Department
FGD	Focused Group Discussion
GoN	Government of Nepal
GWH	Giga Watt Hour
ha	Hectare
HMG/N	His Majesty's Government of Nepal (then)
IEE	Initial Environmental Examination
kV	Kilo Volt
MOPE	Ministry of Population and Environment (then)
MW	Megawatt
NEA	Nepal Electricity Authority
PAF	Project Affected Family
PRA	Participatory Rural Appraisal
PVQ	Pre-Visit Questionnaire
SchEMS	School of Environmental Management and Sustainable Development
SPAF	Seriously Project Affected Family
TSS	Total Suspended Solids
USEPA	United States Environment Protection Agency
VDC	Village Development Committee

INTRODUCTION

Major hydropower development projects in Nepal must conduct Environmental Assessments (EAs), either Initial Environmental Examination (IEE) or Environmental Impact Assessment (EIA), before their implementation. Such assessments are generally conducted during the feasibility study of the project. The Environment Protection Act (EPA), 1996 and Environment Protection Rules (EPR), 1997 (amendment, 1999) are the major legal instruments which provide overall guidance to EAs in Nepal. As per EPR, 1997, each project under consideration is first screened to determine whether it should undergo IEE or EIA.

IEE follows relatively simpler procedure. Scoping and public hearings are not required for IEE study as per EPA, 1996 and EPR, 1997. A list of anticipated impacts and corresponding mitigation measures to be applied are, in general, the final products of an IEE. EIA, on the other hand, includes a series of extensive steps such as scoping, public hearing, impact identification and prediction, alternative analysis, mitigation measures, and environmental monitoring and environmental auditing. Rule 14 of EPR, 1997 clearly specifies the need of conducting environmental auditing for the projects that are subjected to an EIA. As per this Rule, the responsibility of undertaking an environmental auditing is with the Ministry of Environment, Science and Technology (MoEST) and the auditing requirements should be included in the EIA report taking into consideration the Schedule 6 (matters to be mentioned while preparing reports relating to EIA) of the EPR, 1997. The project proponent might also conduct environmental auditing to know its environmental performance. Thus, the principle objective of this guide is to provide guidance to those which will be involved in environmental auditing including project developers, contractors or consultants. It is conducted to ensure that environmental performances carried out in order to comply with environmental laws and standards are comprehensively and systematically reviewed.

There is no detail on "how to" conduct environmental audit in the existing guidelines and laws. This guide describes the components of environmental auditing and provides guidance about issues that arise and require to addressing during its conduction. It is intended to be informative not instructional, and should be used in conjunction with the development of auditing protocol in order to undertake a successful environmental auditing programme.

1.1 Requirements for Environmental Auditing

Rule 14 of the EPR, 1997 requires MoEST to undertake an environmental audit of a project subjected to EIA after two years of the commencement of service. As per this Rule, MoEST is responsible for carrying out environmental auditing and maintain the updated records thereof. In addition, Schedule 6 of the EPR, 1997 requires the project proponent to develop auditing format in the EIA report.

1.2 Why Environmental Auditing?

Environmental auditing can be defined as "a systematic, periodic, documented and objective review of project activities related to meeting environmental requirements". An audit should assess the actual environmental impact, the accuracy of prediction, the effectiveness of mitigation and enhancement measures, and the functioning of monitoring mechanism. Further, the review should be systematic and objective. The objectives of environmental audits are to:

- Verify compliance with environmental requirements;
- Evaluate the effectiveness of in-place environmental management system; and
- Assess risk from regulated and unregulated practices.

Environmental auditing has been universally accepted as one of the components of Environmental Management Plan (EMP) and should be undertaken after construction, during operation, and upon the completion of the project decommissioning as well in the entire life of the project.

1.3 Types of Environmental Auditing

The National Environmental Impact Assessment Guidelines, 1993 has mentioned the following types of audits.

a) Decision Point Audit: It examines the effectiveness of EIA as a decision-making tool.
b) Implementation Audit: It ensures that consented 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 technique by comparing actual against predicted environmental impact.
f) EIA Procedure Audit: It critically examines the methods and approaches adopted during the EIA study.

Apart from the above-mentioned audit types, other types of audits such as waste minimization audit, workplace safety and hygiene audit, pollution prevention opportunity assessment etc. could also be conducted taking into consideration the purpose of audit.

Compliance and management audits are two other broad audit types often used in practice. The former is used to evaluate project compliance status with the current environmental requirements while the later is designed to evaluate an organization's ability to carry out its environmental management programme.

1.4 Trends in Environmental Auditing

Chemical industries in USA were the first to initiate the environmental auditing concept in the early 1970s. As regulations became more complex, non-compliance costs increased, and the U.S. Environment Protection Agency (EPA) stressed the importance of conducting environmental audits to reduce the compliance costs, and environmental managers of several federal agencies began to incorporate audits as essential tools in their operations. As environmental auditing has continued to gain acceptance in both the public and private sectors, new trends in auditing have emerged. Some of the recent development in the field of environmental auditing includes management audits, auditing standards and accreditation of auditors.

1.5 Status of Environmental Auditing in Nepal

Requirement for environmental auditing in Nepal is being included in the EIA reports. The report includes auditing parameters and methods. Manual for Preparing Environmental Management Plan (EMP) for Hydropower Projects, 2002 provides a semi-detailed framework for environmental auditing. Most of the projects having approved EIA reports are still to be implemented thereby limiting environmental auditing legally.

Few hydropower projects in Nepal have conducted environmental auditing, though their EIAs have not been approved through the prescribed legal procedure. The Puwa Khola Hydroelectric Project in Ilam district, the Modi Khola Hydroelectric Project in Parbat district and Kaligandaki "A" Hydroelectric Project in Syanja district are the examples of such projects. A post-construction environmental impact audit study of Kali Gandaki "A" hydroelectric project was conducted by Environment and Social Studies Department (ESSD) of Nepal Electricity Authority (NEA) in 2003. Questionnaire administration, field visit and Focused Group Discussion (FGD) were the main methods adopted for the study (Annex 1).

1.6 Relationship between Auditing and Monitoring

Environmental auditing is closely linked with environmental monitoring, conducted at project construction and operation phases. EIA report can serve as starting point and is, in fact, a good source of information for designing audit programme. Review of monitoring data is often an important basis for undertaking the audit. Monitoring is a continuous activity whereas environmental auditing is one time activity in most cases.

1.7 Relationship between Auditing and Environmental Management Plan

EMP provides details for the implementation of environment protection measures (benefit enhancement and adverse impacts mitigation measures), and conduction of monitoring at different stages. While environmental auditing helps to evaluate the project compliance status and identify new environmental problems, if occurred. Auditing uses the information of compliance and effectiveness of such measures and compares with pre-project condition of environmental resources.

In this context, a clear linkage should be established amongst plan for the implementation of environment protection measures, monitoring and auditing parameters in the EIA report. It should also consider the methods used for baseline data collection and conduction of monitoring and auditing. The differences in methods might affect the audit findings.

FUNDAMENTALS OF AN ENVIRONMENTAL AUDIT

As defined in section 1.2, environmental auditing basically includes the review of project activities related to meeting the environmental requirements. Such reviews may be simple or complex depending upon the complexity of the environmental issues involved and functioning of the in-place environmental management programme. In the former case, audit activities such as site interviews, site walk-through, and review of project's environmental monitoring report may be adequate. In the latter case, more complicated and time-consuming procedures such as sampling, testing, and analysis may be needed. However, in any situation, an audit should provide a systematic and objective evaluation of past activities, descriptions of present status, and recommendations for future actions.

Generally, there are three parties involved in an environmental audit. They are:

- **Auditor:** A person or a team conducting an audit;
- **Auditee:** A project or components of a project being audited; and
- **The third party:** The institution who want to know the result of an audit.

An environmental audit could be internal or external depending upon the party/institution involved as an auditor for the task of mandatory or voluntary auditing. The following definitions and examples would help clarify these frequently used terms:

- **Internal:** When an institution or organization conducts an audit of its own operations/projects to see the performance of its environmental management programme. For example, when a hydropower company conducts an environment audit of its own project, it is referred as internal auditing.
- **External:** When an institution or organization conducts an audit to check how it has performed. For example, when MoEST or third party conducts an audit of a hydropower project, if is considered as external auditing.
- **Mandatory:** When the law requires an audit. For example, Environmental auditing of any hydropower project subjected to an EIA is required by Rule 14 of EPR, 1997; MoEST conducts such audit.
- **Voluntary:** When the law does not require an audit. It is intended to improve the performance of the in-place environmental management system. For example, environmental auditing of any hydropower project subjected to an IEE.

2.1 Use of Environmental Audit

Although environmental auditing is still new for the developing world, the developed countries have nearly 30 years of experience of using it. During this period, necessary improvements have been made. A remarkable development during this period is that the initial focus for compliance audit has gradually been shifted to management audit. Now, it has been established as beneficial in order to evaluate the overall performance of the environmental management plan particularly in the context of introduction of more stringent environmental laws and standards and also refine assessment methods and selection of environment protection measures. It has already gained a wide acceptance in both public and private sectors.

An environmental audit helps to evaluating the project's compliance status and is widely accepted as a mechanism for evaluating the organization's ability to carry out its environmental management programme. Thus, the purpose of environmental auditing should not be limited to pointing out the non-compliance areas only rather it should also be able to trace out the root causes of such non-compliance.

2.2 Choice of Audit Type

Selection of a type of audit is the component of audit programme design and it entirely depends upon its goals and objectives. A wide range of audit types with different names are available (see section 1.3) and a particular audit type can be chosen with or without its fine tuning according to the need. Some audit programmes use only one type of audit while others use two or more than two types in combination. For example, when the objective of the audit is to examine the project's compliance status with the current environmental standards, compliance audit alone can fulfil the purpose. When the audit objective is to evaluate the compliance status and unfold the underlying causes of non-compliance, both compliance and management audit might be conducted.

2.3 Audit Frequency

The use of term "periodic" in the definition of environmental auditing refers to the fact that environmental auditing should not be perceived as a one-time event. Several factors play roles in determining how often auditing should be conducted. Some major factors determining the audit frequency are:

- Audit goals and objectives;
- Nature of the project, location and associated environmental risks;
- Resources available for carrying out the programme;
- Project's compliance status;
- Project's overall environmental management history; and
- Willingness and motivation of the project towards resolving the environmental problems.

On the basis of audit findings, audit report should clearly indicate when and how often the follow-up audits are to be conducted. The time gap between the two audits may vary substantially within the same project. However, the primary determining factor is the functioning of the environmental management plan (EMP) of a particular project. The better the EMP of a particular project, the less will be the number of auditing required and more will be the gap between each pair of audits.

DESIGNING AN AUDIT PROGRAMME

Auditing, in the past, was narrowly defined as a checklist-based approach for evaluating compliance. Auditing now includes the review of the implementation of environmental management plan as a whole. An audit programme can serve both identifying the barriers as against meeting environmental goals as well as solutions for resolving problems. Hence, the designing of audit programme has tremendous importance in achieving the targeted environmental goals.

3.1 Programme Design for Auditing

Design of an environmental audit programme requires careful consideration of the desired goals and objectives. It also requires the development of strategy for conducting pre-audit, on-site audit and follow-up activities. Design factors that should be considered while developing an environmental audit programme include:

- Scope of audit;
- Frequency of audit;
- Types of audit; and
- Level of effort required.

Considerations that influence these audit design are:

- Resources available for carrying out the programme;
- Nature of the project operation and associated environmental issues;
- Scope of the environmental management plan; and
- Perception and support of the project.

3.2 Audit Programme Goals and Objectives

The concerned agency (agency preparing for auditing) should clearly establish long-term goals for the audit programme. Its goals should be complementary to the project's goals for achieving an environmentally sound hydropower development in the country.

After establishing the goals, it is necessary to develop an implementation strategy by determining short and long-term programme objectives. The primary short-term objective of the audit should focus on bringing the project into full compliance with existing environmental requirements. Long-term audit objectives should broaden the programme focus from strict compliance with current requirements to eliminate underlying environmental problems.

3.3 Selecting the Type and Scope of Environmental Audit

The agency should select the type of audit to best meet the audit programme goals and objectives. Auditing activity is increasingly becoming specialized. It is no longer limited to determining compliance with the current requirements. Instead, it can be used to identify and resolve underlying causes of compliance issues. A wide range of auditing types is being used to evaluate current compliance status, future risk of non-compliance and opportunities for minimizing non-compliance.

PROGRAMME ADMINISTRATION AND RESOURCES

4.1 Programme Administration

The process of administering an environmental audit programme is based on the framework and procedures outlined in chapter 3. The success of an audit depends upon building a strong foundation and launching it carefully with proper strategy for each phase of the programme.

4.1.1 Programme Initiation

A number of steps should be taken prior to the formal launching of the audit programme. MoEST and other auditing agency should consider these steps preferably under the direction of senior management.

4.1.1.1 Develop an audit policy

The starting point of an environmental audit programme is often the development of an audit policy. The policy will help to lay the foundation for establishing programme's purpose and functions. The policy should include a detailed description of the scope, goals, and objectives of the audit programme. It should also include discussion on how the audit programme will be managed and administered. In addition, implementation programme should also be developed at this stage. Some of the issues that should be addressed in the strategy include (a) securing resources for funding the programme; (b) assigning roles and responsibilities for programme implementation; and (c) determining the best way of communication with the interested parties.

4.1.1.2 Consulting Services

At the beginning, the auditing agency might take the consulting services to such audit. However, it should clearly provide the terms of reference before awarding for such services. In the long-term, a team of officials comprising of various disciplines might be trained on audit procedures and protocols as a part of capacity building and internalising the auditing activities.

4.1.2 Programme Management Issues and Activities

4.1.2.1 Securing management support

Success of an audit programme requires a commitment and full support from the concerned higher authority during development, performance and follow-up of audit findings and recommendations. Hence, programme manager/in-charge has to secure such support from higher authority prior to the implementation of the programme.

4.1.2.2 Mobilising qualified personnel

The quality of the audit depends, to a greater extent, on the competency of the auditors. The audit team should be knowledgeable about the auditing process, and proper use of methods and techniques. It is also necessary to ensure the inclusion of qualified personnel in the audit team. The team should be provided with clear and specific roles and responsibilities.

4.1.2.3 Audit programme performance measurement

Once an audit programme is underway, it is necessary to assess the consistency and objectivity of audit findings. This can be accomplished by conducting a periodic review of the performance of the audit programme. To accomplish the reviews, the concerned authority might use third party to evaluate performance of the programme.

4.1.2.4 Reporting responsibility

Programme manager should develop strategies for communicating the results of the audit report to management levels and institutions. As EIA documents are made public, it would be appropriate to make the audit report public. This would help in making the EIA reports of similar projects more practical and implementable.

4.1.2.5 Post-audit activities and corrective measures

The project management need to streamline the process for resolving compliance problems and other issues identified during the audit. The findings and recommendations should be implemented to promote compliance and make the project environment-friendly. Corrective action may involve obtaining funding, purchasing new equipment and training. A system of tracking and monitoring the implementation of the corrective actions would be needed for large and environmentally sensitive projects as well.

4.2 Resources and Tools for Auditing

The resources and tools are particularly helpful to the auditors and auditing activities. It may not be required for all audit types. However, auditors should be aware of and utilize potential resources appropriate to the scope and type of audit they are performing.

4..2.1 Pre-Visit Questionnaire (PVQ)

A pre-visit questionnaire (PVQ) consists of a series of written questions directed at the project environmental manager to determine the nature and extent of any environmental issues prevailing at the project area. These questionnaires are also meant to alert project environmental manager about the areas of major concerns including the documents to be reviewed during the audit. PVQ can generally be designed with a careful review of project EIA and monitoring reports. In order to gain the full benefit from PVQ, the questionnaire should be tailored to the project being audited, as well as the type of auditing being conducted. A PVQ should generally be sent to the project office several weeks prior to the audit and should be returned in time to provide the audit team with sufficient opportunity to review the project's responses and prepare for the site visit.

4.2.2 Auditing Protocols

Protocols and checklists provide the audit team an outline for conducting on-site audit activities. It allows the team to evaluate the record keeping, operational and procedural elements of project's activities with respect to the regulatory requirements for a particular compliance area. Protocols and checklists are essential for assuring that an audit has adequately addressed regulatory matters, project records and overall project environmental practices. They provide a consistent approach that promotes comparison between pre- and post-project environmental conditions. They are equally important for evaluating the same facility over a period of time.

The auditing agency should also develop a generic auditing protocol for the project to be audited. The generic protocol can be used as a starting point for developing more targeted protocol that meets the project-specific needs.

4.2.3 Auditing plan

An auditing plan should be prepared to accomplish auditing in a timely and orderly fashion. The *Manual for Preparing Environmental Management Plan for Hydropower Projects* prepared by the Department of Electricity Development (DoED) provides guidance for the preparation of the auditing plan. Auditing plan is, in general, mentioned in the EIA reports as well. The plan is presented in a tabular form separately for each of the physical, biological and socioeconomic and cultural environment with column heading of parameter, indicator, location, methods and sources. The audit plan could be complementary to the audit protocol, but not alternative to them.

4.2.4 Photography

An ordinary camera or a digital camera could be used to document project conditions and serve as a reminder to the auditor of specific areas and issues that require analysis in the audit report. Another benefit of the photographs is that subsequent auditor or even the project personnel can see the exact conditions that existed at the time of the audit. It would also be appropriate to use the movie-camera to demonstrate the actual conditions during the audit. It would help in comparing the pre-project and post-construction stage changes of the environmental resources.

4.2.5 Aerial Photographs

Aerial photographs are invaluable reference for reviews of project structures and land use status. Review of aerial photographs over a period of years can reveal changes in land use. They should also be kept as a part of the audit record if necessary.

4.2.6 Reference Materials

Reference materials such as geological, land use and topographical maps and relevant reference books can be useful in evaluating details about potential environmental risks posed by a project. These materials should be reviewed prior to project audit and should be kept as a part of the project audit record.

AUDITING ACTIVITIES AND REPORT WRITING

5.1 Pre-Audit Activities

An environmental audit consists of several activities conducted in three distinct phases: (i) pre-audit activities; (ii) on-site activities; and (iii) post-site activities.

Setting of specific pre-audit activities is important and it should be conducted by the audit team prior to the site visit. Careful preparation helps to ensure the audit team to accomplish it successfully. Pre-audit involves activities such as (i) setting the objectives and scope of the audit; (ii) planning and preparing the audit team for site visit; and (iii) preparing the project management for audit.

5.1.1 Setting the Objectives and Scope

Adequate orientation about the objectives and scope of the audit is necessary in order to ensure that the audit achieves the desired results. Clear and explicit objectives define the needs and expectations of the audit and establish a benchmark against which the performance of the audit team can be judged. The scope determines the depth and boundaries of the investigation and determines what will be assessed and verified through the audit process.

5.1.2 Planning and Preparation for Site Visit

Careful planning is crucial to ensure that limited time available for the site visit is most effectively used. It also minimizes the time necessary for follow-up activities after the site visit. The important factors that should be considered while planning an audit include: (i) objective and scope of the audit; (ii) project's compliance history; (iii) audit team's familiarity with the site; (iv) resources available for conducting the audit; and (v) desired contents of the final audit report.

The agency responsible for auditing should develop a scope of work that clearly establishes roles and responsibilities for each phase of the audit i.e., pre-audit, on-site and post-audit and it might conduct through consulting services. If in-house staffs are conducting the audit, the team leader should select team members and assign roles and responsibilities to each of them.

5.1.3 Review of EIA and Monitoring Reports

Every team member should review the EIA and monitoring report(s) with due focus on the respective field such as physical, chemical, biological, socio-economic and cultural aspects of the environment. Careful review of the EIA report helps to delineate the project baseline condition before the project construction and assess the project commitments and issues and concerns of stakeholders. Environmental monitoring reports are ideally useful for identifying the non-compliance and other problems areas.

5.1.4 Review and Refining of Audit Protocol

Careful review and adherence to the protocol, generally, allows one to develop a sound audit programme. The audit team might revise the protocol to emphasize those areas that pose high risk or involve complex issues. Such revision would be based upon the PVQ completed and returned by the project. Review and refinement of the protocol is also necessary in order to adjust the required changes.

5.1.5 Preparing Project Management for the Audit

The auditing agency should contact the project formally or informally prior to the site visit. Developing a positive relationship with the project is vital to the success of the audit. The matters to be communicated include:

- Objectives and scope of the audit;
- Critical person needed for interview;
- Records and documents that will be reviewed during the site visit; and
- Time schedule

5.2 On-Site Activities

Some of the important issues that an audit team must address during a site visit are summarised in this section. Introduction with project management, site interviews with pertinent staff, site walk-through, review of record, and exit interview should be conducted as parts of on-site activities.

5.2.1 Introduction with Project Management

The audit team should inform the project sufficiently in advance about the upcoming audit and should arrange an introductory meeting with the project before the site visit. This meeting would help to reassure the project management about the purpose of the audit, provide an opportunity to adequately schedule site walk-through and interviews, and ensure the availability of documents and reports required by the audit team.

5.2.2 Site Interview with Pertinent Project Staff

Interview with pertinent project staff is another helpful activity. It can reduce several hours of work. When addressing a specific environmental issue, audit team members must be careful to direct their questions to the appropriate individuals. The audit team can also interview to clarify unclear PVQ responses.

5.2.3 Site Walk-Through

The site walk-through is the most important activity of the data collection phase of an audit. The success of the walk-through is, in part, a product of leveraging the information collected in the PQV, interviews with project staff, and other pre-site visit efforts. The walk-through should include a physical inspection of critical project components, as well as observation for evidence of mandatory releases or other environmental impacts such as discoloured vegetation or water bodies.

Auditors should stop at various points along the walk-through and document their observations and findings in writing. This is the appropriate time to take photographs.

5.2.4 Review of Records and Documents

The site visit should also include a systematic review of records and documentations. Data should be carefully reviewed and reconciled against permit limits. In addition, the audit team should examine the project's environmental record keeping procedures.

Documentation and record reviews should also include review of correspondence and/or notice pertaining to past or present enforcement actions or agreements. It will help to trace the history of project's performance and to see whether the project is keeping documentation in a proper fashion.

5.2.5 Exit Interviews

The team leader should conduct exit interviews. It would be limited to a brief oral summary of findings and should be conducted with project management present. Auditors should avoid conclusive statements about possible violations and potential liability unless there is imminent danger of harm. Conclusions regarding project status typically should be discussed in final audit report rather than in exit interview.

5.2.6 Use of Environmental Auditing Checklist

Annex 2 provides a framework of an audit checklist which at the start gives parameters to be considered followed by project activities by which the parameters are affected. It also provides a column on the impacts predicted during EIA study, impacts that actually were occurred, measures

that were implemented to minimize the impacts, indicators used to measure the effectiveness, and finally the accuracy of prediction. The accuracy of prediction is explained as numbers of likely impacts are predicted in EIA process. In the process of auditing, it is most desirable to evaluate, how many of the predicted impacts have actually occurred during the project implementation.

5.2.7 Debriefing from Audit Team

While debriefing, the auditing team should discuss the major findings and inform the project management that require immediate actions. The audit team should formulate recommendations for corrective actions.

5.3 Post-Site Activities

The post site activities should be conducted upon completion of the on-site activities. Post-site activities focus mainly on gathering additional data, if necessary.

5.3.1 Prioritizing Audit Findings

The institution responsible for auditing such as MoEST should develop a system for prioritizing audit findings that allow for a consistent approach to addressing deficiencies. A consistent approach for addressing deficiencies includes targeting areas that pose a greater risk to human health and the environment. The system should recognize excellence in environmental management. It is equally important to identify and highlight sound environmental practices as these set an example for other projects.

5.3.2 Clarifying Assignments for Audit Team Members

An audit report typically contains an executive summary, a discussion of audit process, an overview of project and a discussion of findings and recommendations. The team leader should synthesise the final report and write the audit findings in simple and easily understandable language. However, all audit members should have the opportunity to review and comment upon the final report.

5.3.3 Identifying and Gathering Additional Data

It is usual for audit team to identify additional data needs following the site visit. The need to collect additional data should be established, as early as possible and the team leader should coordinate requests for additional data and foreword to the project. Additional data needs typically should focus on securing monitoring data, reports and other documentation and records.

5.4 Audit Report Writing

The report is the zenith of the environmental audit. The primary purpose of the report is to describe the findings of the audit and provide general guidance to the project in achieving and maintaining compliance. A number of aspects should be considered while writing the audit report and conducting the follow-up activities.

5.4.1 Preparation in the Field

During the field visit, audit team members can initiate the report writing process by:

1. Reviewing and updating notes on a daily basis to ensure that information is complete;
2. Allocating some time following interviews to summarize the result in writing;
3. Developing a list of findings;
4. Critically evaluating the audit findings; and
5. Preparing audit team debriefing.

5.4.2 Report Preparation

The audit team should start preparing the report as soon as possible upon the completion of site visit and post-site activities. The list of findings would be helpful in initiating the job. The team

members should consider organizing the findings by compliance area. The audit team should adhere to a consistent format to ensure that subsequent audit reports are prepared in the same manner.

The audit report should be clear and concise, with adequate supporting information. Adjectives (such as high, large, significant etc.) and exaggerations (such as dangerous, criminal etc.) should be avoided.

The report should provide a level of detail that is adequate to allow the users to accurately understand what is being described in the report. Overall, the report should be as short as possible without compromising on necessary detail.

5.4.3 Sample Report Format

Audit reports can be organized in a number of ways depending on the objectives and scope of the audit. However, it is essential that a logical order be maintained. A sample report format is described below:

Section I: Executive summary that highlights the key findings and recommendations of the audit report including a summary of compliance status.

Section II: Description of administrative aspect of the audit. This includes the date the audit conducted, who at the project site was interviewed, who performed the audit, and any limitations regarding the audit scope and methodology. This section should also provide data and information of pre-project condition, results of environmental monitoring and audit data and information. It could be presented in a comparative manner.

Section III: Descriptions of audit findings

Section IV: Recommendations or corrective actions for project compliance

Annexes: Supporting data and information to provide relevant backup

5.4.4 Action Plan and Corrective Measures

An audit programme may also include provisions for follow-up actions on audit findings and recommendations. The audit report would include an indicative action plan to promote the implementation of corrective measures. The plan should indicate timing of actions implementation, necessary staffing, budget and reporting requirements.

Post-Construction Environmental Impact Audit Study of Kali Gandaki "A" Hydroelectric Project

Introduction

The post-construction environmental impact audit study was conducted in early 2003 by Environment and Social Studies Department of Nepal Electricity Authority (NEA) as per the contract signed with the Kali Gandaki "A" Hydroelectric Project. This audit study is first of its kind for a large hydropower project and is mainly targeted to fulfil the purpose of Asian Development Bank (ADB) loan covenant.

The following professionals were included in the audit team:

- Civil Engineer
- Environmental Engineer
- Ecologist
- Forester
- Fish and Wildlife Expert
- Socio-economist
- Sociologist
- ACRP Expert
- Hydrologist
- oil Erosion Expert

Objective and Scope of the Audit

The objectives of the audit study were to:

- Collect post-construction environmental and social data of the project area;
- Find out the accuracy of the impact prediction;
- Assess actual environmental impacts which occurred due to the implementation of the project;
- Evaluate the variations and the effectiveness of implemented mitigation measures;
- Identify the remedial issues; and
- Suggest the corrective measures

The scope of the study included review and assessment of the project documents, collection of field data, collection of local people's and stakeholders' views, co-ordination of this study with the line ministry, identification of remedial issues with corrective measures and preparation of the audit report. The study has covered three components of the project namely: access road, power generation facilities, and transmission line.

Limitations of the study

Non-availability of proper auditing guidelines has been mentioned as a major limitation of the study. It is also mentioned that the study team did not find the audit guidelines within ADB as well. The other limitations of the study mentioned in the report are:

- Review of all documents accumulated during the entire project period was hardly possible due to limited time for the study;
- Data of different surveys (pre-project and post-project) might not be comparable due to different methodologies adopted;
- The present fish survey was conducted in the month of August and there is no baseline data for this month; and
- This study lacks dry season data for the fish and water quality in dewatered and reduced flow zones.

Audit Methodologies

Literature review, field-visit, sampling, questionnaire administration, interviews, and group discussions were the main methods adopted by the audit team. The team analysed the data and prepared the draft report. A workshop was organized in Kathmandu to share and discuss the audit findings.

Project Information

Kali Gandaki "A" Hydroelectric Project is located in Syangja district of Western Development Region, about 180 km west from Kathmandu. Project construction started in 1997 and was completed in May 2002. Commercial hydropower production was started from August 2002. The project has an installed capacity of 144 MW. The average annual energy production is about 826 GWh. This is the largest hydropower project constructed so far in Nepal. The project basically has three components: access road, power generation facilities, and transmission line.

The access road for the project starts at Batuwa, 82 km from Pokhara (3.5 km south of Galyang Bazar), in Siddartha highway and ends at the left bank of the dam. Length of the access road from Jaipate to powerhouse is 8 km. Total length of the temporary and permanent access roads is about 28.5 km. Two access roads start at Jaipate and provide access to the dam site (Mirme) and powerhouse site (Beltari).

The main power generation facilities are located in the Shri Krishna VDC of Syangja district. The dam in Mirmi is a gated structure which is 44 meters high. The headrace tunnel is 7.4 meters in diameter and is about 5,905 meters long. The surge tank in Beltari is 61.5m high (up to top of the highest wall). The powerhouse lies in the left bank of the Kali Gandaki and is a semi-underground structure housing three francis turbines of 48 MW capacity each.

The 132 kV transmission line is spread in four districts namely: Syangja, Palpa, Rupendehi and Kaski. The transmission component is divided into two portions: 44 km double circuit to Butwal. A sub-station was constructed in Lekhnath Municipality of Kaski district whereas the existing Jogikuti sub-station in Butwal was upgraded. The right-of-way of the 132 kV is 9m in each side from the centreline.

Major Impacts of Constructional and Operational Phases

The impacts of the projects constructional and operational phases have been mentioned as:

- A 5.3 km long (65ha) reservoir has been created due to submergence of grassland, forestland and other lands;
- The diversion of flow from dam site has made the section from Mirmi to Badigad as dewatered section and flow in the riverbed was found almost dry in the month of April 2003;
- The construction and operation of the dam has caused an increase in water level as well as sedimentation level thereby causing serious threat to the Seti Beni Bazar and submergence of Shaligram Sheela (holy stone);
- The scrap materials such as used cement bags, vehicle tires, used drums containing oil etc. were dumped at Thulo Bagar on the left bank of the Kali Gandaki River. This situation calls for water pollution during the high flood season.
- A total of 11 fatalities and 17,234 injuries occurred during the project construction.
- Barrier effect of the dam and prevention of the upward migration of the fish was noticed.
- A total of 6,093 trees of Sal, Saj, Chilune, Sissoo, Khyar, Bakaino Ipil-Ipil was removed.
- ·In total, for all three components, 371 hectares of land was acquired for placement of project structures and facilities.
- Altogether 1,468 families lost their land (fully or partially). Out of these, 263 families were defined as SPAFs and 1,205 families as PAFs. The SPAFs experienced a loss of 50-60% of their assets and the PAFs lost 25% of their land, and lost fodder trees and livestock by 50%.

- A total of 221 families lost their houses (65 for access road, 15 for main facilities, 11 for workshop, 126 for transmission line alignment and 1 for Pokhara substation). A total of 21 houses from 17 Bote families were acquired.
- Due to impounding of Kali Gandaki and Andhikhola River, most of the present cremation sites along the riverbanks upstream are submerged whereas the cremation sites in the downstream is affected by the reduced flow of Kali Gandaki River.

Audit Findings

Status of mitigation measures is as follows:

- A mandatory release of 4 m^3/s, i.e., ten percent of the minimum monthly flow to maintain the downstream aquatic life was proposed in EIA report. During auditing, it was observed that there was no flow from the dam. Furthermore, no additional 2 m^3/s water was released on religious days which caused significant impact on downstream religious sites.
- A siren system to warn people about very high flows is functioning but needs capacity increase to be more effective for long-distance population.
- Bioengineering was introduced but needs to be continued in the access road section.
- More than three hundred thousand plants of different species were planted in the project area. The survival rate has been observed as 40-50% till 2002.
- A fish hatchery has been constructed for producing one million fingerlings, but its effectiveness remains to be seen.
- Payment of appropriate compensation has been made for the loss of land, house and other assets due to implementation of the project.
- An additional rehabilitation grant has been provided at the rate of NRs. 1000/month for 4 months to the affected families.
- A grant to pay the government registration fee was also provided as an incentive to those affected families who purchased land as replacement.
- The impact on house loss was compensated at replacement cost. Affected households were also provided the construction materials of their old house for reuse.
- The project has provided employment to 2,568 people during construction and 225 people during the operational phase.
- Out of the total allocated sum of NRs. 2.9 million for micro-credit revolving fund only a sum of NRs. 0.62 million was spent in 28 different groups of affected families.
- About 3,000 households have been electrified in 11 VDCs of Syangjha, Gulmi, Parbat and Palpa districts.
- In addition to the committed mitigation works in the EIA report, several community development works on peoples' demand such as the renovation of Jagatra Devi temple, establishment of a primary school for Botes and support to school for room extension etc. were developed.

Outstanding issues

The followings are the outstanding issues as mentioned in the report:

- Preparation of the operational manual for power station regarding the environmental issues such as mandatory release of 4 m^3/s, and additional flows of 2 m^3/s during religious days;
- Increasing the intensity of the siren;
- A conclusive study about the submergence problem in the Seti Beni Bazar;
- Plantation of 35 hectares in Rupendehi district and 17,415 seedlings in transmission line area;
- Implementation of community forest support programme for Khabar area; and
- Protection work for Seti Beni, housing for the remaining 10 Bote families, agriculture intensification programme, micro-credit revolving fund disbursement, and construction of cremation sheds etc.

Recommended Corrective Measures

The project will have the overall responsibility for managing Kali Gandaki "A" HEP including environmental and social mitigation measures and monitoring. Based on the roles and responsibilities of NEA-ESSD, the environmental works can be effectively carried out by NEA-ESSD, provided that required budget is in place. The estimated cost for the corrective measures for the period of five years is NRs. 37.7 million.

Lessons Learned

The audit report has mentioned followings as the lessons learned during the study.

- Involvement of international consultants in the environmental issues should be limited.
- Community development works need to be addressed by the project prior to, during and after the project construction.
- All budget allocated for the environmental works must be channelled through the environment wing.
- All mitigation works to be done must be specified and put in the bill of quantities together with the provision of reward and punishment for the contractor.
- Frequent change of high level officials makes it difficult for the continuity of the project.

Conclusion

The study has concluded that most of the impacts were predicted accurately during the project formulation stage; environmental and social condition of the project area is good; effectiveness of the contract clauses was slightly more than 50 percent; and outstanding works must be completed as soon as possible.

Annex 2

Sample Audit Checklist

1. Physical Aspects

S.N	Parameters	Project Activity	Predicted Impact	Actual Impact	Mitigation Measure	Effective ness	Indicator	Sources of data	Accuracy %
1	Air quality								
2	Water quality								
3	Noise level								
4	Slope stability								
5	Hydrology								
6	Land use pattern								

2. Biological Aspects

S.N	Parameters	Project Activity	Predicted Impact	Actual Impact	Mitigation Measure	Effective ness	Indicator	Sources of data	Accuracy %
1	Forests								
2	Flora								
3	Fauna								
4	Non-timber forest products (NTFPs)								
5	Fishes								
6	Rare and Endangered Species								
7	Conservation Sites								

3. Socio-Economic Aspects

S.N.	Parameters	Project Activity	Predicted Impact	Actual Impact	Mitigation Measure	Effective ness	Indicator	Sources of data	Accuracy/ Precision
1	Employment								
2	Education								
3	Agriculture								
4	Immigration and migration								
5	Health and sanitation								
6	Aesthetic value								
7	Gender issues								
8	Religious and cultural resources								

Field-Testing of Environmental Auditing Guide

1. The Context

After the drafting of this guide, it was tested in the field in order to examine its:

- Relevance in the implementation; and
- Applicability in the actual field of hydropower projects.

A study team from SchEMS - the service provider - tested the guideline in the Khimti Hydropower Project from 11 to 17 September 2004. Consultation, interaction, meeting and presentation and field investigations and filling of monitoring checklist were carried out during the field work. The details of the outcomes of field testing are given in following pages.

2. Objectives of Field Testing of Auditing Guidelines

The National EIA Guideline, 1993 has emphasized on the importance of environmental auditing to assess the actual impact, accuracy of prediction, effectiveness of mitigation measures and enhancement measures and the functioning of monitoring mechanisms. In this line, a study team has field-tested this guide in order to:

Bio-engineering techniques for slope protection at Head Works

- Examine whether or not the implementing agency understands this guide and applies in the field;
- Find out whether or not the guide are useful for decision-makers, proponents or general public;
- Also find out strength and weaknesses of guide and their relevance to the present practice; and
- Investigate whether or not the checklist developed are useful to collect the information from the local community and concerned stakeholders.

3. A brief description of the Khimti I Hydropower Project

The Khimti Hydroelectric Project generating 60 MW is located along the boundary of Ramechhap and Dolakha district in the central development Region of Nepal. It is operating since the last four years The Khimti Khola catchment is estimated to be approximately 443 km^2 in area. The intake site is located in Rasanalu and Hawa VDCs of Ramechhap and Dolakha district respectively and the powerhouse site is located in Sahare of Dolakha district. In the operation of Khimti I Hydroelectric Project, Himal Power Limited (HPL) took the responsibility for mitigation and monitoring, although it may still engage other agencies or specialists to assist. In the project operation, responsibilities of the staffs and organization are divided, in which they have to submit the reports based on the facts to the concerned.

Consultants prepare reports and submit to Project Manager and General Manager (HPL) annually or half yearly. Then Project Manager prepares report based on the operation related mitigation activities, issues, problems, solutions and submits to General Manager (HPL) quarterly, and submits to Department of Electricity Development annually.

Interactions with local people

Irrigation Canal and piped water supply for the affected VDC

4. Methodology

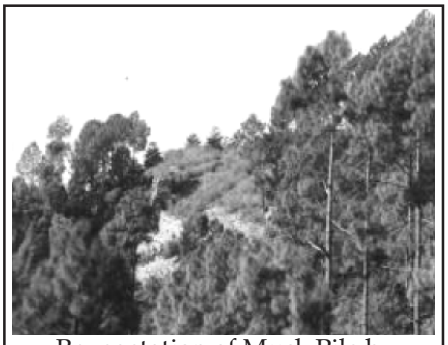
The Guide was tested as per directives from steering committee. A team was formed in SchEMS for testing the Guide and preparing the checklists of monitoring. Concerned individuals, stakeholders, VDCs, Project Office were duly informed for the meeting (Annex 4).

Initially, relevant national and international monitoring reports and Guidelines, EIA report of Khimti project were thoroughly reviewed and the monitoring activities mentioned in the report were analyzed. Checklists and parameters for monitoring were developed.

Bio-engineering technique adopted by the project at Adit 5

This was followed by a field visit from 11 to 17 September 2004 in Khimti Hydel Project site office. Observation of the various component of the project site like headworks, powerhouse site and adits were made. Study on the records maintained, and the mitigation measures adopted by the project to minimize the impacts were also examined. Similarly the present situation of the project site and the vicinity was also made to assess biological, physical and socio-economic environment. Likewise, Participatory Rural Appraisal (PRA) was applied in Gogan Tar, intake site (Salle) and powerhouse site (Kirne) in order to gather information.

The main aim of testing this guide was to assess the level of impact around the project area, accuracy/precision of the predicted impacts and its effectiveness. The completed checklists presented in Tables 1 and 2 represent the summary of the investigation carried out during field testing.



Revegetation of Muck Pile by spreading top soil

5. Limitation and Conclusion

The guide was tested in limited time. Since monitoring includes continuous measurement, one time field observation and consultation carried out for this project may not represent the true picture. Additionally, an extensive consultation with the people of the adjoining VDCs and the visit to different project locations were restricted because of the security reason. However, information obtained through consultation and observation in limited time has been presented in Table 1. It can be concluded that the monitoring checklist and the Guide correspond to the field condition. Moreover in due course of time of its utilization, changes, modification, refinement, and improvement in the Guide should be done for effective auditing.

Table 1: **Audit Checklist**

1. Physical Aspects

S.N.	Parameters	Project Activity	Predicted Impact	Actual Impact	Mitigation Measures	Effectiveness	Indicators	Sources
1	Air Quality	Construction / crushing plant/vehicle emission	1. Increase of air-borne dust 2. Possible health hazard	Increase of air borne dust	1. Reduce vehicle distance travel 2. Water sprinkling 3. Install dust filters,	High	1. Dust on the leaves of trees 2. No. of patients with respiration diseases	Informat from local/ propone clinic, etc (monitor informat
2	Water Quality	Spoil dumps/side casting	1. Increased sediment load in river 2. Grease and oil problem	1. Increased sediment load 2. Grease and oil problem	1. Keep main construction area clean 2. Collect all waste oil for safe disposal 3. Vehicle maintenance	Adequate	Water Quality Record	Laborato Propone Observat (Monitor informat
3	Noise Level	Use of machineries, vehicle, transportation and blasting	Noise pollution during construction	Noise pollution	NA	NA		Local
4	Slope Stability	Excavation and side casting	1. Cutting of slopes 2. Creation of steep high wall sections 3. Slope instability	1. Slope instability 2. Creation of high wall	1. Implement erosion protection measures 2. Back fill to stable contours 3. Rehabilitate/revegetate disturbed slopes	High	Erosion/land slide/ rock slide (Observation)	Visual/l (Monitor records)
6	Hydrology	Construction and dam operation	1. Disruption to river bed 2. Seepage of ground water 3. Reduced river flow	1. Disruption to river bed 2. Reduced river flow	1. Minimize in river construction area 2. Release of minimum flow downstream	High	Availability of water downstream	Local/vi (Monitor Records)
7	Land Use Pattern	Land acquisition, compensation and operation	Change in Landuse	No landuse change	NA	NA	Loss in agriculture production	Local/vi propone (Monitor Reports)

2. Biological Aspects

S.N.	Parameters	Project Activity	Predicted Impact	Actual Impact	Mitigation Measures	Effectiveness	Indicators	S
1	Forest/Flora	Construction of tunnel, physical facilities, labour Camps	Some trees would be cut	Trees were cut	1. Minimize project land requirement 2. Compensate with plantation	High	Plantation site	L / (R
2	Fauna	Audits, access road, and permanent facilities	1. Loss of habitat 2. Illegal hunting	1. Loss of habitat 2. Illegal hunting	1. Implement forest habitat protection measure 2. Ban workers from hunting 3. Minimize project land requirement	High	Local reports	L P (R
3	Fisheries/ Fishes	Operation and construction	1. Obstruction to passage of migratory fish 2. Impacts on spawning and nursery bed	1. Obstruction to passage of migratory fish 2. Impacts on spawning and nursery bed	1. Fish Ladder 2. Continuous water flow	Moderate	Fishes (Monitoring Reports)	L o (R
4	Endangered Species	Audits, access road, tunnel, and permanent facilities	1. Loss of endangered species	1. Loss of endangered species	Minimize project land requirement	Low	Local information	L (R

3. Socio-Economic Aspects

S.N.	Parameters	Project Activity	Predicted Impact	Actual Impact	Mitigation Measures	Effectiveness	Indicators	Sources of data	Accuracy/ Precision
1	Employment	Construction and operation	1. Job opportunity to locals 2. Income generation	1. Job opportunity to locals 2. Income generation	1. Give priority to the locals 2. Only skilled labour from outside	High	No. of local employees	Local/ proponent (Monitoring Reports)	Correct 100%
2	Education	Construction and operation	1. School will be displaced 2. Number of students in schools	1. Loads of students in the schools	1. Build and update the displaced school 2. Updated local schools	Moderate	Condition of the school improved	Local/ Proponent/ Principal of school (Monitoring Reports)	Correct 80%
4	Agriculture/ Irrigation	Construction and operation	1. Temporary land ownership 2. Local transactions 3. Irrigation problem in the downstream	1. Temporary land ownership 2. Local transactions 3. Irrigation problem in downstream	1. Development of agro forestry program 2. Continuous downstream flow 3. Introduction of agriculture package 4. Maintenance of irrigation canal	High	Life style of local farmers and their reports	Local/Visual/ Proponent (Monitoring Reports)	Correct 100%
5	Immigration/ out migration	Access Road, and permanent facilities	1. Influx of workers from outside 2. Displacement of locals	NA	1. Only skilled labours from outside 2. Compensation to displaced families	Adequate	No. of local employees and Compensation received	Local/visual/ Proponent (Monitoring Reports)	Correct 80%
6	Health and Sanitation	Construction and operation	1. Diseases from outside 2. Diseases caused by pollution 3. Lack of water supply	1. Lack of water supply	1. Establishment of clinic 2. Pipeline water supply system to the most affected communities 3. Introduction of toilets	High	Health condition No. of new toilets	Local/clinic record/ observation (Monitoring Reports)	Correct 80%
7	Aesthetic value	Construction and operation	NA	Loss of scenic beauty	Restoration of construction sites	High	Scenario	Observation	Correct 70%
8	Gender Issues	Construction and operation	1. Gender based division of labour 2. Women's workload	1. Gender based division of labour 2. Women's workload	1. Skill training 2. Preferences to the women	High	No. of women employees	Local/ Proponent (Monitoring Reports)	Correct 70%

Note: High = 80 – 100 percent impacts are mitigated; Moderate = 50-79 percent impacts are mitigated; Adequate = 20-49 percent impacts are mitigated; Low = 0-19 percent impacts are mitigated.

List of Contacted Persons in the Field

Name	Address
1. Khada B. Bista	Plant Manager, Himal Hydropower, Kirne
2. Gyanendra B. Karki	Headworks Manager, Himal Hydropower, Salle, Betali
1. Lok Bikram Karki	Salle
2. Dilli B. Karki	Salle
3. Bet Bahadur Karki	Salle
4. Lila Bahadur Karki	Salle
5. Gopi Nath Phuyal	Khimti Hydropower
6. Jhapendra Nath Gyawali	Technician, Himal Hydropower
7. Khus B. Karki	Betali
8. Chhatra Bikram Karki	Charikot
9. Harka B. Bhujel	Rasnalu
10. Suman Thapa	Rasnalu
12. Dal B.Dhungel	Rasnalu
13. Lalit Karki	Rasnalu
14. Chhatra Kumari	Rasnalu
15. Chandra B. Sunuwar	Thulo Patal
16. Chandra Jirel	Giri
17. Dal B. Sunuwar	Thulo Patal
18. Dhal Bahadur B. K.	Hawa
19. Ganga Ram Ghimire	Rasnalu
20. Geni Sherpa	Rasnalu
21. Hari Sharan Adhikari	Namdu
22. Kamal Bhandari	Betali
23. Keshar Karki	Betali
24. Keshav Thapa	Betali
25. Khil P. Sharma	Chhyama
26. Khus B. Sunuwar	Hawa
27. Kushe Tamang	Thulo Patal
28. Nabin Thapa	Betali
29. Ratna Bdr. B. K.	Shahare
30. Prem Khatri	Pulasi
31. Surya B. Karki	Chhyama
32. Yagya Karki	Chhyama
33. Nawaraj Neupane	Shahare
34. Lalit B. Sunuwar	Pharpu
35. Marma Lal Tamang	Bhedapu
36. Dilip Sharma	Principal, Project School
37. Kamala Karki	Teacher, Kirne
38. Maili Karki	Hotel Owner, Kirne
39. Hari Shankar Phuyal	Kirne, Shahare
40. Keshav Kadariya	Shahare

Finalization Workshop on Environmental Auditing Guide

1. Introduction

The then Ministry of Population and Environment and Norwegian Directorate for Nature Management (DN) entrusted School of Environmental Management and Sustainable Development to develop this guide. After its field testing, a workshop was organized on 10 October 2004 which was attended by the representatives from various sectors (Annex 6) for discussion and finalization of the Guide.

Guests and participants interacting in the workshop

2. The Finalization Workshop

A workshop was organized in order to collect comments and suggestions to improve the Guide. The participants were invited to attend the workshop. Prior to the workshop, the draft document was sent to the participants so that the participants have an opportunity to read them thoroughly.

In the workshop, held on 10 October 2004, Mr. Vinod Jnawali Joint-Secretary and Chief of Environmental Division of the then MOPE chaired the session. Mr. Reider Hiudrum, a long term advisor was invited as guest. An overview of draft Guide was presented in the workshop. This was followed by an intensive discussion. The following were the major comments and suggestions for improvement.

- Refer the annex in the text;
- Suggest pre-auditing within one year;
- No need to mention the amendment of EPR, 1997;
- Do not use full EIA, just use EIA;
- Check section 1.3 and 1.4;
- Add one paragraph on internal auditing;
- Define accuracy and precision in audit checklist; and
- Define audit protocol.

Discussions taking place in the workshop

3. Participants in the workshop

At the end of the workshop, Mr. Vinod Jnawali opined that the environmental monitoring for hydropower projects is a new start. Although EPR does not provide a framework on how to carry out monitoring of the development project, it is important to start it. This Guide provides a clear-cut framework and clarifies the importance of environmental monitoring.

It will ease the process of integrating environmental auditing in EIA report and its implementation. He concluded that the comments and suggestions of the participants are very appropriate and advised SchEMS to include the relevant suggestions. Mr. Jnawali thanked the organizer and DN for assisting in the implementation of this project.

Note: *Relevant comments and suggestions are included in the guideline*

Participants from various agencies interacting in the workshop

List of Workshop Participants

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