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PRIVATE SECTOR HYDROPOWER DEVELOPMENT PROJECT

FINAL REPORT

June 12, 1998 - December 2001

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Title: Increased Private Sector Participation and Investment in Environmentally and Socially Sound Hydropower

International Resources Group, Ltd.
Department of Electricity Development
Ministry of Water Resources
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1. Introduction

This Final report summarizes the work carried out under the Private Sector Hydropower Development Project (PSHDP) by International Resources Group (IRG). Work under this project was carried out under US Agency for International Development (USAID) Contract No. 367-C-00-98-000710-00 awarded June 12, 1998. Work under this contract supported USAID's Special Objective 4 (SpO4) to increase private sector participation and investment in environmentally and socially sustainable hydropower development. USAID extended this contract until December 31, 2001 in order to provide uninterrupted support to the Government of Nepal (GON) agencies, until a follow-on contract was awarded.

This report summarizes the activities carried out under this contract, compares expected and actual outputs and performance indicators, and lists documents produced, training and workshop sessions conducted, and other key events supporting the SpO4.

1.1 Purpose of Project

The purpose of the PSHDP is to support the aim of SpO4 which is to increase private sector participation and investment in environmentally and socially sustainable hydropower development.

1.2 Background

An adequate and dependable supply of electricity is essential for modern economic and social development. Nepal's large hydroelectric potential is among its principal natural resources. However, only a small portion of its potential has been developed to date and Nepal suffers from inadequate and unreliable electricity supply to meet the increasing demand. Potential environmental and social impacts have been among the concerns slowing proposed developments. Recognizing these factors, the Government of Nepal (GON), the U. S. Embassy in Nepal, and the USAID Mission to Nepal (USAID) have been and are cooperating in a series of efforts to strengthen the country's electricity sector. The most recent of these efforts are the Private Electricity Project (1995-1998) and the current Private Sector Hydropower Development Project (1998-2001).

The GON has enacted a number of significant legislations aimed to strengthen and broaden the participation in the electricity sector. Noteworthy among them is the 1992 legislative package dealing with private sector participation in the electricity and other sectors. The GON also enacted a series of legislative acts and institutional changes to bring environmental and social review processes up to international standards. These laws, regulations, and their implementation, however, together with other factors, result in a complex and potentially lengthy approval and development process.

The Electricity Development Center (now the Department of Electricity Development, DOED) was established in the Ministry of Water Resources (MOWR) to develop and implement the hydro project licensing process and to monitor operation of these projects. The final authority to issue licenses rests with the Secretary of the MOWR. The DOED's mandate also includes promotion of private investment and development of hydropower and facilitating private developers and government owned agencies such as the Nepal Electricity Authority (NEA) to work with GON agencies through a "one window" operation.

2. Expected Results (Outputs or Indicators)

Performance of PSHDP efforts under SpO4 are measured by the following indicators:

Indicator 4.1 Private sector companies progressing toward hydropower investment.
Unit of Measure: Stages of progress from application for survey license, or response to Request For Qualifications, to financial closure, construction license, construction, and operation.

Indicator 4.2 Private financial commitments for environmentally and socially sound hydropower project development.
Unit of Measure: Cumulative total in dollars of financial commitments by private financing institutions for projects with satisfactory EIAs and SIAs.

In addition, the overall performance is monitored under two intermediate results (IRs):

IR4.1 - Improved Enabling Environment for Private Sector Investment in Hydropower
IR4.2 - Increased Environmental and Social Soundness in Hydropower Development

The following indicators measured under IR4.1 and IR4.2:

IR4.1:

Indicator 4.1.1 Improvements for the hydropower investment process.
Unit of Measure: Points from an enabling index, which provides an illustrative list of improvements in the investment and EIA/SIA processes and assigns points to those improvements.

IR4.2:

Indicator 4.2.1 EIAs and SIAs for hydropower proposals implemented by international standards (World Bank)
Unit of Measure: Cumulative number of EIAs and SIAs reviewed by EDC in accordance with World Bank guidelines.

Indicator 4.2.2 Public hearings for hydropower projects conducted with local stakeholders and NGOs.
Unit of Measure: Cumulative number of hearings, as specified, by private sector hydropower companies and by EDC.

These indicators are reasonable measures of progress toward the accomplishment of the strategic objective. They also depend substantially on decisions to proceed with hydroelectric developments by parties outside this project and EDC.

Current status in relation to the performance indicators is presented on the following tables. The tables show performance indicators slightly revised from the above definition to conform to data used by the USAID in its annual R4 report for 1999.

Performance Data Table: IR - 4.1

Objective Name:	Increased Private Sector Participation and Investment in Environmentally and Socially Sound Hydropower			
Objective ID:	367-004-01			
Approved:	November, 1997	**COUNTRY/ORGANIZATION:** USAID/Nepal		
RESULT NAME:	Increased Private Sector Participation and Investment in Environmentally and Socially Sound Hydropower			
INDICATOR: IR 4.1	Private financial commitments for hydropower project development			
UNIT OF MEASURE: Millions of US Dollars		**YEAR**	**PLANNED**	**ACTUAL**
SOURCE: Department of Electricity Development (DOED)		1997 (B)	NA	238
INDICATOR DESCRIPTION: Cumulative total of U.S. dollars (millions) in financial commitments by private financing institutions for development of hydropower projects.		1998	275	278
		1999	325	303
COMMENTS:		2000	400	319
		2001	475	323

Performance Data Table: IR - 4.1.1

Objective Name:	Increased Private Sector Participation and Investment in Environmentally and Socially Sound Hydropower	
Objective ID:	367-004-01	
Approved:	November, 1997	**COUNTRY/ORGANIZATION:** USAID/Nepal
RESULT NAME: IR 4.1 :	Improved enabling environment for private sector investment in hydropower	
INDICATOR: IR 4.1.1:	*Private sector projects progressing towards hydropower investments*	

UNIT OF MEASURE: Cumulative total number of projects which have passed important stages towards completion of a private hydropower project

SOURCE: Department of Electricity Development (DOED)

INDICATOR DESCRIPTION:

a) Stage 1 - survey license issued

b) Stage 2 - construction license requested

c) Stage 3 - feasibility study completed

d) Stage 4 - financial closure

COMMENTS: All numbers are cumulative and track the progress of private proposal from the initial granting of a survey license through financial closure which signals the beginning of construction. The target numbers are cumulative.

YEAR	PLANNED	ACTUAL
1997 (B)	NA	a) 13 b) 3 c) 3 d) 2
1998	a) 3 b) 3 c) 2 d) 2	a) 21 b) 3 c) 3 d) 4
1999	a) 4 b) 4 e) 3 d) 3	a) 27 b) 4 c) 4 d) 4
2000	a) 5 b) 5 c) 4 d) 4	a) 53 b) 11 c) 6 d) 5
2001	a) 6 b) 6 c) 5 d) 5	a) 75 b) 11 c) 11 d) 6

Performance Data Table: IR - 4.2

Objective Name:	Increased Private Sector Participation and Investment in Environmentally and Socially Sound Hydropower			
Objective ID:	367-004-01			
Approved:	November, 1997	**COUNTRY/ORGANIZATION:** USAID/Nepal		
RESULT NAME:	Increased Private Sector Participation and Investment in Environmentally and Socially Sound Hydropower			
INDICATOR: IR 4.2	Environmental/Social Impact Assessments for hydropower proposals			
UNIT OF MEASURE: Number of Environmental/Social Impact Assessments		**YEAR**	**PLANNED**	**ACTUAL**
SOURCE: Department of Electricity Development (DOED)		1997 (B)	NA	2
INDICATOR DESCRIPTION: Cumulative number of Environmental/Social Impact Assessments approved by Ministry of Water Resources in accordance with HMGN regulations.		1998	3	3
		1999	4	3
COMMENTS: A major goal of this Special Objective is to ensure that hydropower investors adequately address environmental and social impacts of hydropower projects. Environmental and Social Impact Assessment will be carried out in accordance with the HMGN's Environment Protection Act of 1997 and the Environment Conservation Rules of 1997.		2000	5	6
		2001	6	7

Performance Data Table: IR - 4.2.1

Objective Name:	Increased Private Sector Participation and Investment in Environmentally and Socially Sound Hydropower	
Objective ID:	367-004-01	
Approved:	November, 1997	**COUNTRY/ORGANIZATION:** USAID/Nepal
RESULT NAME: IR 4.2:	Increased environmental and social soundness in hydropower investments	
INDICATOR: IR 4.2.1	Public hearings for hydropower projects conducted with local stakeholders and NGOs	

UNIT OF MEASURE: Numbers of Hearings	**YEAR**	**PLANNED**	**ACTUAL**
SOURCE: Department of Electricity Development (DOED)	1997 (B)	NA	4
INDICATOR DESCRIPTION: Cumulative number of public hearings held by private sector hydropower companies.	1998	5	5
	1999	7	9
COMMENTS: If the government and private sector companies hold more hearings in the local communities, the local stakeholders and Nepali NGOs will have more of an opportunity to voice their concerns.	2000	9	11
	2001	11	17

3. Major Activities Leading to the Indicator Targets

3.1 Intermediate Result (IR) 4.1: Improved Enabling Environment for Private Sector Investment in Nepal

In an effort to achieve improvements in the enabling environment for private sector investment in hydropower, IRG conducted the following activities:

3.1.1 Developing Department of Electricity Development (DOED) Capabilities

Power Development Fund

A major effort in developing DOED capabilities was in the context of establishing and administering a Power Development Fund (PDF) as part of the World Bank's Power Development Project (PDP). A number of documents relating to the Power Development Fund have been prepared, and these documents include:

a) Request for Qualifications (RFQ) for the Power Development Fund Administrator (PDFA)
b) Evaluation Report for Short-listing of Financial Institutions for receiving Request for Proposal (RFP)
c) Request for Proposal for the PDFA
d) Administration Agreement
e) Borrower's Implementation Plan (in draft form)

Results to date

Six financial institutions submitted their qualification statements, in response to DOED's RFQ for the PDFA. DOED/IRG reviewed the qualification statements and short-listed four financial institutions for receiving the RFP for the PDFA. Three financial institutions submitted their proposals. The Ministry of Water Resources (MOWR), HMGN and World Bank approved the RFQ, RFP, and short-listing of the four financial institutions.

DOED/IRG completed the evaluation of technical proposals submitted by the three financial institutions, and was ready to initiate review and evaluation of financial proposals following the concurrence and approval of the technical evaluation by the MOWR and World Bank, respectively.

Private Development of Build, Own, Operate, and Transfer (BOOT) Projects

DOED/IRG prepared documents for private development of the 30-MW Kabeli "A" and 27-MW Rahughat hydropower projects for the BOOT and International Competitive Bidding (ICB) process. The documents include:

a) Request for Qualifications for two BOOT Projects
b) Evaluation Report for Short-listing Bidders for receiving RFP
c) Request for Proposal
d) Model Project Agreement (PA)
e) Model Power Purchase Agreement (PPA)

DOED/IRG issued the RFQ, received qualification materials from 10 bidders, and short-listed seven bidders for receiving the RFP. The MOWR and World Bank approved the RFQ and short-listing of the seven bidders. DOED/IRG prepared the RFP along with the model PA and model PPA.

Results to date

The World Bank reviewed the model PA and model PPA, and Bank's review comments were received by DOED. The RFP was under the World Bank's review.

Strengthening DOED Processes, procedures, and building staff capabilities

The following activities were undertaken to develop and enhance DOED's capabilities:

- Directed significant efforts to set up and initiate the "one-window" operation. While some success has been recorded, significant work in streamlining the one-window approach remains to be done and will be addressed in the next phase.

- Reviewed the process that private power developers have to follow and identified steps needed to improve the climate for private investment.

- Reviewed DOED's computer models for operation of a multi-purpose water resources project, estimate of multi-purpose benefits, and economic and financial analysis of hydroelectric projects; conducted a series of discussions sessions with DOED staff on estimates of multiple water use benefits, power and energy studies, river/reservoir and power plant system operation, and economic and financial analysis of hydropower and multi-purpose water resources projects.

- Conducted a series of seminars and workshops for the DOED staff in the areas of legal, financial, regulatory, banking, engineering, environmental and social aspects of private sector hydropower development. These seminars and workshops include: IPP Policies and Implementation, Electricity Tariffs, Regulatory Processes, Cost and Tariff Methodologies, Restructuring, Regulation, and Privatization of Electric Utilities, Approach to BOOT Hydro Development, Institutional Development, Technical Approach & Guidelines for BOOT Hydro, Power Development Fund Process and Operation, Financial Closures of Private Hydropower Projects, and HMGN Foreign Exchange Capability.

- Senior DOED staff attended international conferences including the World Energy Congress, World Power Conference, PowerGen Conferences, South Asia Regional Energy Forum. DOED staff also prepared and presented illustrated talks on hydropower development opportunities in Nepal to international audiences in Nepal and abroad.

3.1.2 Improving DOED Procedures

DOED's procedures were improved through the extensive work in (i) the development of necessary forms and documents; (ii) guiding the process of establishing a PDF Administrator; (iii) selecting private power developers for two hydropower projects through BOOT and ICB process; and (iv) implementing several elements of the "one-window" approach.

A draft **Hydropower License Handbook** was prepared and reviewed by DOED. This draft handbook should be finalized by GON to incorporate regulations contained in the recently approved Hydropower Development Policy 2058 (year 2001).

Alternative models for a fee system whereby DOED could charge appropriate fees and earn revenues were identified and discussed with DOED. Collection of fees for use of a specific agency, such as DOED, appears to be either difficult or impossible under existing legislation. Accordingly, this issue has not been pursued further.

Multiple standards are in use for hydropower project design and construction in Nepal, for both private and public sector projects, often depending on the sponsorship of individual projects. This complicates and makes more difficult DOED's roles in licensing and monitoring during construction and operation of these projects.

To improve DOED procedures, the following two Guidelines were developed:

a) Guidelines for the Feasibility Study of Run-of-River Hydropower Projects in Nepal;
b) General Guidelines for Design, Construction, and Operation and Maintenance of Hydropower Projects in Nepal

3.1.3 Understanding and Addressing Constraints

Efforts to improve DOED's capability to identify and solve legal, regulatory, financial and institutional constraints affecting private sector involvement in domestic and export power generation were made. IRG worked closely with DOED staff in developing the RFQs and RFPs for the PDFA and two BOOT hydropower projects, short-listing of bidders for receiving RFPs, and model power agreement and model power purchase agreement.

A draft of a proposed Nepal Hydropower Policy was prepared and discussed with DOED. Subsequent to this effort, a new Hydropower Development Policy 2058 was approved by GON in October 2001.

A study to determine the availability of foreign exchange to meet GON commitments for convertibility under project agreements related to power purchase agreements was conducted and updated periodically through the 3-1/2-year study period. The study concluded that GON would be capable of generating foreign exchange to meet IPP power purchase payments for the existing 60-MW Khimti and 36-MW Bhote Koshi projects, and new IPP hydropower projects with installed capacity up to 100 MW.

3.1.4 Lessons Learned and Recommended Activities

- From experiences of the last three years, it was learnt that a closer working relationship with the World Bank – Nepal office staff with periodic meetings among the World Bank, USAID, DOED and IRG staff, was needed to discuss progress and issues relating to the PDFA and BOOT projects and associated documents. More effort is needed in this direction to expedite the World Bank and Ministry of Water Resources' review and approval process in the future.

- DOED should review identifying a counterpart team of DOED staff for each Activity for working with IRG team consisting of resident staff and short-term specialists visiting Nepal. This will facilitate the exchange of study approaches and procedures for carrying

out each activity, improve work efficiency, and capacity building of the DOED through working closely together with the IRG team.

- IPPs in Nepal have commented about the urgent need of improving the "one-window" approach.

- It is recommended that periodic review meetings be held to discuss the performance of the "one-window" approach and adjustments and improvements made as required.

- To successfully apply a multiple water use computer model in a river basin system for estimating downstream benefits of multiple water uses is a very difficult and advanced task, especially in the case of Nepal and India. Prior to application of the model, an extensive training program for estimating the benefits of each of the multiple water uses, including hydropower, water supply, flood control, irrigation, navigation, and environmental enhancement should be conducted. Technical assistance and training provided so far amounts to a cursory review of these issues.

- The draft Hydropower License Handbook should be finalized to incorporate regulations contained in the newly approved Hydropower Development Policy 2058. A review of the Hydropower Policy should be conducted, and recommendations for possible revisions to the Policy should be made for considerations of future amendments to the Policy by the HMGN.

- A series of guidebooks for private development of hydropower projects in Nepal should be prepared. The guidebooks should be developed in various levels. The first-level guidebook should be concise and contain summary descriptions of existing laws, regulations, process and procedures relating to implementation of hydropower projects in Nepal by IPPs, and it is intended for use of decision makers of the IPPs;

- Second-level guidebooks should contain more detailed descriptions of licensing process and discuss what has to be done in order to file applications for survey license, construction license, etc. It should also include the requirements for a feasibility study of a hydropower project and preparation of EIA/SIA.

- Third-level guidebooks should contain technical details including study approaches and methodology, technical specifications, etc., for conducting a study in a specific technical area, such as design of a hydropower project, water quality standards, minimum release requirement, etc. These guidebooks are intended for use of specialists of various disciplines, such as environmental scientists, power engineers, etc.

- A more detailed operation/maintenance and inspection guideline is needed for use of DOED staff for conducting inspections of IPP developments during construction and operation of these projects. These guidelines should contain checklists of items to be investigated during an inspection.

Annexes 4.1a, 4.1b and 4.1c provide lists of documents produced, presentations, discussions, training sessions, and workshops conducted, and DOED staff attendance in international conferences and training courses.

3.2. Intermediate Result (IR) 4.2: Increased Environmental and Social Soundness in Hydropower Development

IRG brought together specialists drawn from DOED, local experts from the School for Environmental Management and Sustainable Development (SchEMS), IRG subcontractor METCON, IRG international consultants, and IRG staff, to form an Environmental Impact Assessment (EIA) Team. The Team undertook a number of activities to effect an increased environmental and social soundness in hydropower development.

3.2.1 Improving the EIA Process

The EIA Team developed a four-step process for achieving environmentally and socially sustainable hydropower development in Nepal:

- Understanding the EIA process – The Team reviewed the existing EIA process and produced the informative Source Book #1. The team held a number of workshops and training sessions to train local agencies and practitioners of the EIA process.

- Identifying where improvements can be made to the EIA Process – Team members identified weaknesses in the EIA process and potential methods to improve the process. An interagency workshop was then held to discuss the EIA Team's findings and to develop a consensus plan for effecting improvements. This interagency workshop resulted in preparing a Strength-Weakness-Opportunities-Threats (SWOT) proceeding.

- Implementing the proposed improvements - A major conclusion of the SWOT Proceedings was that a series of manuals should be developed to guide developers and other stakeholders through the EIA process. The Team developed a series of such manuals. Draft manuals were discussed in interagency workshops and finalized. Until a formal approval from the MOWR was received for publication and distribution of the manuals, the manuals were used as internal documents by the DOED, MOWR, and the Ministry of Population and Environment (MOPE) and refined as necessary.

- Evaluating the effectiveness of the improvements – On publication, DOED would request feedback from the agencies, developers, and other stakeholders on the usefulness of the manuals for future update and refinement.

Annex 4.2a provides a checklist of activities conducted and products developed in the course of the Team's efforts. A number of proceedings, manuals, and reports (see Annex 4.2b) were produced as part of this activity.

3.2.2 Workshops

A series of five interagency works were held to receive input from governmental and non-governmental EIA practitioners. The first workshop carried out a critical review of the EIA process, and established priorities for improving the EIA process. Subsequent workshops refined technical manuals for use by GON administrators, developers, and other stakeholders. A summary of these workshops is provided in Annex 4.2.c.

3.2.3 Training Courses

The EIA Team participated in six EIA training courses at SchEMS. SchEMS is affiliated with Pokhara University and is the main environmental training center under a memorandum of understanding with the MOPE. Each of these courses consisted of two weeks of formal class room lectures. A total of 123 GON officials, NGOs and the private sector attended these courses.

In addition, we provided a one-day training sessions on the World Bank EIA requirements. A one-day focused intensive EIA training to DOED staff was also conducted. A listing of these courses is provided in Annex 4.2.d.

3.2.4 Field Trips and Public Hearings

As part of the EIA improvement process, members of the EIA Team made seven field trips to eight existing hydropower projects. During this period, DOED staff attended 12 public hearings. A listing of these visits and meetings is given in Annex 4.2.e.

3.2.5 Reviews of EIA Documents and Review Meetings

The EIA Unit of DOED has three staff. With the help of the EIA Team, DOED staff reviewed 92 documents (Terms of Reference (TOR) for the initial environmental Evaluation (IEE), IEE Report, Scoping Document, TOR for EIA, and EIA Reports) and attended 27 review meetings between November 1998 and September 2001 (Annexes 4.2.f and 4.2.g).

3.2.6 Public Information Center (PIC)

The DOED and IRG were accommodated in temporary offices between November 2000 and December 2001 and it was difficult to develop a public information center. However, by December 2001 DOED moved to new and bigger premises where a PIC would be housed.

Three-dimensional models for eight projects were made during 2001 to assist in public participation and understanding of the projects. A preliminary DOED website was ready in December 2001 but was not operational. When the site is operational, downloadable versions of EIA manuals and databases would be available for users.

3.2.7 Lessons Learned

- Maximizing the use of local expertise formed an effective team as a result of continuity of the thought process. This facilitated the EIA Team to take a holistic approach to the entire project.

- Inputs from short-term overseas experts produced better and cost-effective results when their expertise was used to review and improve draft documents produced by local experts.

- Many EIA practitioners were not clear about the legal requirements in the EIA process. Also, the standards and formats of the EIA documents being produced were not uniform. It is recommended that appropriate manuals and EIA training be developed to streamline EIA documents.

- Interagency participation in developing the manuals has been a prime reason for success in producing useful manuals. Recognition of contributors in the final documents has also been a factor.

- Workshops are most effective when the participants were divided into small groups, each with a coordinator; availability of draft manuals to the participants in advance of workshops resulted in useful interaction.

- The preliminary introduction and orientation regarding the manual to be reviewed should be kept to a minimum.

- The participants' outputs are maximized when the workshops are held at locations away from their normal places of work.

- All training on hydropower EIA should include an overview of the economic and social importance of hydropower to Nepal as a whole.

- Training should be expanded to include the B.Sc. and M.Sc. courses at SchEMS, and the master's program at Tribhuvan University.

- DOED are advised at very short notice about public hearings. This results in many public hearings not being attended by DOED staff.

- There is concern that some public hearings are not representative, in particular with regard to the participation of women; guidelines need to be developed for carrying out public hearings; it is recommended that some training also be given on how to conduct public hearings.

- The staffing level of DOED's EIA Unit needs to be evaluated and strengthened appropriately.

- A system for tracking documents through MOWR and MOPE need to be set up.

- The computerized system for review of documents must be tested and implemented.

- The development of the PIC must include the hydropower developers from both public and private sectors.

4. Recommendations

Individual reports and documentation prepared during the course of PSHDP recommended several specific actions. We refer the reader to our reports listed in Annex 4.1a for details. Based on the accomplishment of this project, we recommend that USAID provide continuing technical assistance to the DOED and other key GON agencies in the power sector. We recommend that such technical assistance address the following broad areas:

- Enhance DOED capacity to effectively implement one-window operation;
- Strengthen DOED capacity to enhance its effectiveness in meeting its added responsibilities within the framework of the Hydropower Development Policy 2058 to regulate sustainable hydropower development;
- Broaden DOED's privatization skills to enhance effectiveness in structuring private sector projects such as the BOOT projects
- Assist DOED to enhance its effectiveness in the promotion of private sector participation in hydropower development;
- Strengthen other GON agencies such as the NEA to develop methodologies and procedures to meet goals of the Hydropower Development Policy 2058;
- Augment development of guidebooks and manuals to assist private sector to understand and complete and comply with existing environmental laws;
- Strengthen DOED capability to enhance its effectiveness to train its staff, local practitioners, other GON agencies, and NGOs in the preparation of adequate and complete environmental documentation required to license hydropower projects.

Annex 4.1a - List of Documents Produced

1. Inception Report, August 1998
2. Work Plan for Year One, September, 1998
3. Request for Qualifications for Hydroelectric Development by BOOT Method; Revised draft dated December 18, 1998. Second revised draft dated March 16, 1999
4. Terms of Reference for PDF Administrator, December 1998
5. The Andhi Khola Hydel and Rural Electrification Project: Success Stories in Environmentally and Socially Sound Hydropower Development, February 1999
6. Training Needs Assessment and First Year Training Plan, February 1999
7. First Semi-Annual Report, March 1999
8. Request for Qualifications for Hydroelectric Development by BOOT Method: Second Revised Draft dated March 16, 1999 was updated after exchange of comments with World Bank, April 1999
9. Draft Proposed Nepal Hydropower Policy, June 1999
10. Subtask 2.4, Design, Safety, and Procedural Guidelines, was provided to DOED for review, discussion, and comment (First Draft), July 1999
11. First Annual Report, August 1999 (Revised December 1999)
12. Electricity Tariff Issues in Nepal, September 1999
13. Summary of Preliminary Recommendations, Nepal Hydropower Project Licensing Scheme and Practice, December 1999
14. Handbook for Applicants for Hydropower Licensing in Nepal, December 1999
15. Preliminary Draft of Technical Standards and Guidelines for Hydropower Development in Nepal, December 1999
16. 4-volume sets of Regulation Source Book, December 1999 (hard Copy only)
17. A General Guide to Hydropower Authorization in Nepal, December 1999
18. Draft Report on Nepal Hydropower Development Regulation Recommendations, January 2000
19. Semi-Annual Report for the Period July 1999-January 2000, April 2000
20. Terms of References (TOR) for Power Development Fund Administrator (PDFA) and Information for Bidding, May 2000
21. Draft Administration Agreement for Power Development Fund Administrator, May 2000
22. RFQ Advertisement Notice which has been published beginning the procurement process for the two BOOT hydro projects: Kabeli-A and Rahughat Khola Hydroelectric projects, July 2000
23. Work plan for Period July 2000 – July 2001, July 2000
24. Evaluation Report on Review and Short-listing of Financial Institutions for Power Development Fund Administrator (PDFA), October 2000
25. Request for Proposal (RFP) for PDFA including Administration Agreement, January 2001
26. Evaluation Report on Review and Short-listing of Bidders for the two BOOT Hydroelectric Projects, January 2001
27. Second Annual Report for the Period of July 1999 – July 2000, April 2001
28. Third Semi-Annual Report for the Period of August 2000 – January 2001, April 2001
29. Request for Proposal for the two BOOT Hydroelectric Projects, May 2001
30. Draft Nepal Power Development Fund Borrower's Implementation Plan, August 2001

Annex 4.1a - List of Documents Produced (Continued)

31. Updated Memorandum and Report on Availability of Foreign Exchange to Meet Convertibility Commitments of IPP Project Agreements, May 2001
32. Draft Model Power Purchase Agreement, August 2001
33. Third Annual Report for the Period of August 2000 – July 2001, August 2001
34. Draft Model Project Agreement, September 2001
35. Guidelines for the Feasibility of Run-of-River Hydropower projects (10-100 MW), Main Report and Appendix, December 2001
36. General Guidelines for Design, Construction, and Operation and Maintenance of Hydropower Projects in Nepal, December 2001

Annex 4.1b - List of Presentations, Discussion and Training Sessions, and Workshops Conducted

1. November 1998; Mr. Daud Beg presented a seminar on "Overview of IPP Policies" to an audience of EDC staff
2. February 1999; Ms. Jacqueline DeRosa; Workshop on Electricity Tariffs
3. February 1999; Ms. Mary Clark Webster; Workshop on Regulatory Processes
4. February 1999; Dr. Charles Ebinger; IPP Implementation
5. June 1999; Dr. Hasso C. Bhatia; Cost and Tariff Methodologies
6. June 1999; Mr. Thomas P. Gross; Restructuring, Regulation, and Privatization of Electric Utilities
7. June 1999; Mr. Osvaldo A. Juvier; Approach to BOOT Hydro Development
8. July 1999; Ron Grady; Technical standards in hydro development including water standards
9. July 1999; Mary Webster; Training Workshop on Regulation & Institutional Development
10. July 1999; Duke: Training materials for Technical Approach and Guidelines for BOOT Hydro
11. August, 1999; Hasso C. Bhatia; Electricity Pricing Workshop – Cost & Tariff Methodology
12. August 1999; Oswaldo Juvier: Implementation of BOOT hydro projects
13. August 1999; L.D. Nichol and Dr. Stefan Gorzula; Nepal Hydro in SARI Context
14. September 1999; Ken Lussier; Working sessions on HMGN foreign exchange capability
15. September 1999; Laurel Heacock; Implementation of Hydropower Development Regulatory Scheme
16. November 1999; Hasso Bhatia; Working sessions on NEA approach to tariff calculations and rate design
17. November 1999; Ken Lussier; Formal PDFA Discussions and Working Sessions on short-listing documents, and RFP for PDFA.
18. December 1999; Ron Grady, John Northrop, Laurel Heacock; Detailed discussions of proposed technical standards
19. Dr. Gorzula; A one half-day training course was given to 14 staff of DOED on how to use the internet
20. February 2000; L.D.Nichol; Workshop on Hydropower Regulation & Overall Climate for Private Investment
21. March 2000; Mary Webster; Utility Regulation Expectation
22. September 2000; Kenneth Lussier, Sessions on financial closures of private hydropower projects and PDFA process
23. October 2000; L. L. Wang; Sessions on "Project and River Basin Planning"
24. November 2000, L. L. Wang; Three sessions for the DOED staff. These sessions include:
    - Hydropower project and system operation, simulation and optimization
    - Power and energy study
    - Economic analysis
25. November 2000; L. L. Wang; Session on "Multi-purpose Water Resources Development"
26. December 2000 – December 2001; L. L. Wang: Sessions on Benefit/Cost Analysis of Multiple Objectives, Financial Analysis, Optimization of Principal Hydraulic Structures, Emergency Action Plan (EIP), etc.

Annex 4.1c - List of DOED Staff attended International Conferences and Training Courses

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1. Three DOED and one MOWR officials attended the 1998 World Energy Congress in Houston from September 13 to 18. A post-conference program was arranged for these four. They visited the offices of IRG's subcontractor, Duke Energy & Services, in Charlotte, NC, and Duke Energy's Bad Creek Pumped Storage Project in western North Carolina. An additional stop in Denver, Colorado, with a visit to parts of the USBR Colorado-Big Thompson project, was arranged for two DOED officials.
2. One DOED official attended the PowerGen Asia 1998 conference in New Delhi in September 1998 to present a paper on Hydro Power Trends and Opportunities in Nepal
3. Ten DOED officials attended the Nepal Engineers' Association meeting, held in Kathmandu in December 1998
4. Two personnel from DOED attended a short course in project and infrastructure finance presented in Washington, DC, by the IP3 group, in March 1999
5. Two DOED officials attended a one-week course in tariff calculations in a regulated environment, presented in New Delhi under USAID sponsorship in April 1999.
6. One DOED official represented Nepal at the Trade & Development Agency's World Power Conference in New York in May 1999, and visited Washington D.C., after the Conference, to meet with personnel of the World Bank Group, USAID, and IRG in Washington D.C.
7. One DOED official presented a paper on hydro development opportunities in Nepal at the PowerGen conference in Singapore in May 1999
8. One DOED official attended a one-month course in introduction to Geographic Information Systems presented in Kathmandu by the Central Geography Department of Tribhuvan University in June 1999
9. Four DOED geologists and engineers attended the International Symposium on Engineering Geology, Hydro-geology and Natural Disasters with emphasis on Asia, held in Kathmandu during the period of September 28-30, 1999
10. A total of five HMGN officials including three from DOED, and one each from MOWR and NEA attended a Core Training Course on Infrastructure and Regulation and Reform in Agra India during the period of February 7 – 18, 2000
11. One official from DOED and one from MOWR visited U.S. and attended the World Water Forum 2000 during the period of March 15 through April 10, 2000
12. Four members of DOED staff attended the International Course on Small Hydropower Development in Kathmandu on April 17-22, 2000
13. Two DOED staff attended the Training on Environmental Impact Assessment (EIA) in Kathmandu during the period of July 16 – August 15, 2000
14. Two members of DOED staff and two Ministry of Water Resources (MOWR) officials attended the Hydrovision in Charlotte, U.S.A. on August 8-11, 2000
15. Two officials of DOED and one official of MOWR received training on procurement procedure for World Bank aided projects on August 14-23, 2000 in India
16. Two of the DOED staff and one MOWR official attended the ICOLD Congress 2000 in China on September 13-22, 2000
17. Two DOED staff received the training on infrastructure and regulation and reform in Sri Lanka on December 4-15, 2000
18. Two DOED staff and one MOWR staff attended a 101th Basic Management Program in Philippines during the period of March 12-30, 2001
19. One DOED official and one MOWR official attended Waterpower XII Conference in Salt Lake City, U.S.A. on July 9-14, 2001

Annex 4.1c - List of DOED Staff attended International Conferences and Training Courses (Continued)

20. Three DOED officials received training on energy and power sector procurements, contract agreements and compliance monitoring strategies for private sector power and public-private partnerships projects in Washington D.C., U.S.A. for the period of July 30-August 10, 2001
21. Two DOED staff attended a two-week EIA Training Program organized by SchEMS in September-October, 2001 in Kathmandu
22. Two members of the DOED staff attended the Third Nepal Geological Congress in Kathmandu on September 24-26, 2001
23. Two DOED officials and four MOWR officials attended the 18th World Energy Congress in Buenos Aires, Argentina during the period of October 21-25, 2001

Annex 4.2.a - Checklist of Contract with Corresponding Products and Events

IR 4.2 A: Developing EDC (DOED) Capabilities

i) EDC develops the capacity to design scopes of work for Environmental Impact Assessments (EIAs). Note that in Nepal, the EIA methodology for hydropower projects includes the Social Impact Assessment (SIA).

Products	Events
Source Book #1	SWOT Workshop
SWOT Proceedings	Scoping and TOR Workshop
Scoping Manual	
TOR Manual	
EIA computerized format	
EMP computerized format	

ii) EDC improves its capability to review and assess the adequacy of EIAs (including SIAs), engineering proposals, and mitigation measures submitted by private sector developers and/or NEA.

Products	Events
Review Manual	Review Manual Workshop
EMP Manual	EMP Workshop
IEE Manual	
Ranking and Rating Manual	
EIA computerized format	
EMP computerized format	

iii) Periodic auditing or monitoring standards are developed and adopted by EDC which will permit EDC to perform routine monitoring of hydropower projects.

Products	Events
EMP Manual	EMP Workshop
Water Quality Manual	Water Quality Workshop
Middle Marsyangdi Trip Report	Middle Marsyangdi Field Trip
First Marsyangdi Trip Report	First Marsyangdi Field Trip
Modi Khola Trip Report	Modi Khola Field Trip
Kaligandaki "A" Trip Report	Kaligandaki "A" Field Trip
EMP computerized format	

iv) Guidelines are developed for EDC's consideration that require stakeholder groups to be consulted in a participatory process at all appropriate times before and after issuance of a construction license.

Products	Events
Public Involvement Manual	Public Involvement Workshop
Andi Khola Report	Field Trip to Andi Khola
Scale models of hydro projects	SchEMS Training Dec 99
DOED web site	

v) EDC acquires an enhanced capability by the end of FY 2000 to measure contractor and special activity progress towards results that will increase environmental and social soundness of hydropower investments.

Products	Events
Sourcebook #1	
SWOT Proceedings	SWOT Workshop
All Manuals	

IR 4.2 B: Improving GON Procedures

vi) Guidelines and standards for EIAs (including SIAs) for hydropower projects in the 1997 Environmental Protection Act and the 1997 Environmental Conservation Regulations are reviewed in light of EDC's additional experiences with private developers to see if changes are needed. This review will take into consideration both international standards and the Nepali context. Recommended changes to the Act and the Regulations will be proposed and submitted to EDC after due deliberations with MOPE.

Products	Events
Sourcebook #1	
SWOT Proceedings	SWOT Workshop
Water Quality Manual	Water Quality Workshop

vii) Formats and methodologies for evaluation of EIAs (including SIAs) are re-evaluated based upon: a) EDC's experiences while monitoring environmental impacts; and b) insights which EDC acquires during negotiation of project agreements with private developers and NEA. Improvements are identified that will facilitate effective communication between EDC and MOPE and will enhance EDC (and GON) procedures for review, evaluation, and approval of EIAs (including SIAs) that are prepared by private sector developers and NEA. Personnel in EDC are fully trained in use of these improved formats and methodologies and acquire the capability to carry out an "international expert level" review of EIAs (including SIAs)

Products	Events
Review Manual	Review Manual Workshop
EIA computerized format	

viii) National water standards for hydropower projects are developed which are consistent with international standards and the Nepali context and are provided to EDC for review and consideration.

Products	Events
Water Quality Manual	Water Quality Workshop
Report on Laboratories	Visits to Water Quality Laboratories
	Site Visit to Middle Marsyangdi

ix) The non-profit NGO community in Nepal will become more aware of EIA (including SIA) procedures, will be more fully involved in the development of EIA (including SIA) guidelines and standards, and will increase their participation in public hearings on project-specific impacts and mitigation proposals for hydropower projects.

Products	Events
Public Involvement Manual	Public Involvement Workshop
Sourcebook #1	Anti-dam Lobbyist Workshop
NGO database	SchEMS Training Courses

Annex 4.2.b - Brief Description of Proceedings, Manuals, and Reports

1) *Success Stories in Environmentally and Socially Sound Hydropower Development: The Andhi Khola Hydel and Rural Electrification Project.* Report prepared for the Office of Agriculture and Rural Development, USAID/Nepal, February, 1999. (STATUS: submitted to USAID).

2) *SOURCE BOOK #1: An internal working document for Task Four: Develop EDC's Capabilities to Manage the Environmental and Social Impact Analysis Process, and, Task Five: Improve GON Procedures for Conducting and Reviewing Environmental and Social Impact Assessments.* (STATUS: internal working document)

   The source book is a single volume compilation and analysis of both national and international requirements for hydropower EIAs.

3) *Proceedings of One-day SWOT Analysis on Environmental Impact Assessment (EIA) Process in Hydropower Projects.* (STATUS: published)

   This one-day brain storming session revealed the strengths, weaknesses, opportunities and threats of the EIA system in Nepal. The findings resulted in directions for improving the existing system.

4) *Manual for Preparing Scoping Document for Environmental Impact Assessment (EIA) of Hydropower Projects.* (STATUS: published)

   Scoping is the first task in the EIA process and much of the EIA study depends on the investigations made during scoping. The output of scoping forms the basis for the TOR. Nepal did not have systematic guidelines for undertaking EIA scoping. This manual provides systematic and effective guidelines of undertaking scoping for hydropower projects.

5) *Manual for Preparing Terms of Reference (TOR) for Environmental Impact Assessment (EIA) of Hydropower Projects, with Notes on EIA Report Preparation.* (STATUS: published)

   Terms of Reference are fundamental to the EIA study. Nepal did not have a uniform system for developing TOR for hydropower projects. This manual provides a step by step process for complying with EPR54.

6) *Manual for Preparing Environmental Management Plan (EMP) for Hydropower Projects.* (STATUS: submitted to MOWR for publication)

   Preparing an EMP is a requirement of EPR54. However, there is no uniformity or consistency for the inclusion of subject matters for the EIAs of hydropower in the existing process. This manual includes all of the essential components of an EMP and describes a systematic process for integrating the EMP into the EIA.

7) *Manual for Reviewing Scoping, Terms of Reference (TOR) and Environmental Impact Assessment (EIA) Reports for Hydropower Projects.* (STATUS: printed manuals and preliminary computerized format being circulated to DOED, MOWR, MOPE and SchEMS)

   In the current system of EIA no consistent review criteria exist for the authorizing agencies. This manual provides a consistent and uniform system.

8) *Manual for Preparing Initial Environmental Examination (IEE) Report for Hydropower Projects.* (STATUS: requires interagency workshop)

   An IEE is required for hydropower project between 1 and 5 MW of installed capacity. This manual provides systematic and consistent guidelines for IEE preparation and review.

9) *Manual for Public Involvement in the Environmental Impact Assessment (EIA) Process of Hydropower Projects.* (STATUS: published)

   This manual describes how effective public involvement at all stages in the project cycle will save both time and money.

10) *Manual for Developing and Reviewing Water Quality Monitoring Plans and Results for Hydropower Projects.* (STATUS: submitted to MOWR for publication)

    This is a "second level" manual that covers the water quality effects of hydropower development, the relationship between water quality, hydraulics and hydrology, and the types of hydropower projects and their possible effects on water quality and mitigation measures.

11) *Manual for Prediction, Rating, Ranking and Determination of Significant Impacts in Environmental Impact Assessment (EIA) of Hydropower Projects.* (STATUS: requires interagency workshop)

    Impact prediction is required to examine the characteristics and significance of the environmental effects of project implementation. In this manual an overview of the methods that can be used is given.

Annex 4.2.c - List of Interagency Workshops

1) Environmental Impact Assessment Process for Hydropower Projects in Nepal: One-Day SWOT Analysis (Blue Star Hotel, 10 March 2000).

   A total of 28 participants attended from the Department of Electricity Development, the Ministry of Water Resources, the Ministry of Population and Environment, the Department of Water Supply, the Department of Forests, the Rural Electrification Development Project - UNDP, the National EIA Association of Nepal, Melamchi Water Supply Board, Butwal Power Company Ltd., METCON Consultants, International Resources Group, and the US Agency for International Development.

2) Workshop on Guidelines for Scoping and Terms of Reference (TOR) for Environmental Impact Assessments (EIAs) of Hydropower Project in Nepal (Godavari, 22 and 23 May, 2000).

   A total of 31 participants attended from the Department of Electricity Development, the Ministry of Water Resources, the Water and Energy Commission Secretariat, the Department of Forests, the Department of Soil Conservation and Watershed Management, the Department of Water Induced Disaster Prevention, the National EIA Association of Nepal, Nepal Electricity Authority, Butwal Power Company Ltd., Lamjung Electricity Development Company, Himal Power Limited METCON Consultants, International Resources Group, and the US Agency for International Development.

3) A Workshop on Draft Guidelines for Developing and Reviewing Water Quality Monitoring Plans and Results for Hydropower Developments (SchEMS, 16 March 2001).

   A total of 23 participants attended from the Department of Electricity Development, the Ministry of Water Resources, the Ministry of Science and Technology, the Water and Energy Commission Secretariat, the Department of Hydrology and Meteorology, Nepal Electricity Authority, the School for Environmental Management and Sustainable Development, Lamjung Electricity Development Company, Water Engineering and Training Centre (WETC), METCON Consultants, International Resources Group.

4) Workshop on Manual for Reviewing EIAs and Manual for Preparing Environmental Management Plans (Summit Hotel, 24 and 25 May, 2001).

   A total of 38 participants attended from the Department of Electricity Development, the Ministry of Water Resources, the Water and Energy Commission Secretariat, the Ministry of Population and Environment, the Department of Roads, the Department of Water Induced Disaster Prevention, the National EIA Association of Nepal, Nepal Electricity Authority, Butwal Power Company Ltd., Lamjung Electricity Development Company, Himal Power Limited, Bhote Koshi Power the Company, Melamchi Water Supply, METCON Consultants, International Resources Group, and the US Agency for International Development.

5) Workshop on Manual for Public Involvement in the Environmental Impact Assessment (EIA) Process of Hydropower Projects (Radisson Hotel, 7 August, 2001).

   A total of 43 participants attended from the Department of Electricity Development, the Ministry of Water Resources, the Water and Energy Commission Secretariat, the Ministry of Population and Environment, the Ministry of Local Development, the Department of Water Induced Disaster Prevention, the National EIA Association of Nepal, Nepal Electricity Authority, Lamjung Electricity Development Company, GITEC NEPAL (P) Ltd., the School for Environmental Management and Sustainable Development Habitat for Humanity, New Era, Pro Public (Forum for Protection of public interest), ENPHO Nepal (Environment and Public Health organization), National News Agency, The Rising Nepal, METCON Consultants, International Resources Group, and the US Agency for International Development.

Annex 4.2.d - List of Training EIA Practitioners

A) School for Environmental Management and Sustainable Development (SchEMS).

1) First Environmental Impact Assessment (EIA) Training Course

From July 1st to August 1st, 1999, a total of 16 trainees participated from the Department of Industry, Tribhuvan University, Women's Rights Forum Office (Pokhara), Butwal Power Company, New ERA, Bagmati Integrated Watershed Management Programme, ECO Himal, Kathmandu Metropolitan City (KMC), East Consult, Water and Energy Commission Secretariat (WECS), and the Tree Improvement and Silviculture Component (TISC).

The sessions conducted by the EIA team were:

- Key Environmental Concepts - Prof. Govind P. Ghimire
- An Introduction to EIA - Dr. Ram B. Khadka
- An Evolution of EIA: Why Bother about the Environment? - Dr. Stefan Gorzula
- EIA in International Perspective - Dr. Ram B. Khadka
- EIA is Frequently a 2-sided Coin - Dr. Stefan Gorzula
- Project Screening/IEE - Dr. Ram B. Khadka
- Methods of Screening/IEE - Dr. Ram B. Khadka
- Introduction to Scoping and Methods of Scoping - Dr. Ram B. Khadka
- Public Participation and Social Impact Assessment - Dr. Stefan Gorzula
- Public Participation in EIA Process in Nepal - Dr. Ram B. Khadka
- Integrated River Basin Management - Mr. Dow Nichol
- Introduction to Impact Identification - Dr. Ram B. Khadka
- Introduction to Integrative Impact Assessment - Dr. Ram B. Khadka
- Introduction to EIA Report Review - Dr. Ram B. Khadka

2) Second Environmental Impact Assessment (EIA) Training Course

From December 6th to 22nd, 1999, a total of 25 trainees participated from Environmental and Public Health Organization (ENPHO), Institute of Cultural Affairs Nepal , Society of Environmental Journalists, Department of Forest, School for Environmental Management and Sustainable Development, Tribhuvan University Nepal Law Campus, Department of Irrigation, Department of Roads, Plant Protection Division, Ministry of Tourism, Ministry of Local Development, Kathmandu Metropolitan City (KMC), Supreme Court of Nepal, Department of Water Supply, Aqua Minerals, Ministry of Industry, Butwal Power Company, Department of Livestock Services, Department of Electricity Development, Nepal Oil Corporation, and Department of Drug Administration (Ministry of Health).

The sessions conducted by the EIA team were:

- An Introduction to EIA - Dr. Ram B. Khadka
- EIA Principles and Processes - Dr. Ram B. Khadka
- EIA Scoping Procedures - Mr. Sudesh Malla
- Initial Environmental Examinations - Dr. Ram B. Khadka
- Public Participation and Consultation in EIA Process - Dr. Stefan Gorzula
- Methods of Public Participation and EIA - Dr. Stefan Gorzula
- Environmental Management Plan - Dr. Ram B. Khadka
- Review Criteria for Scoping, TOR and EIA - Dr. Stefan Gorzula
- Review of Scoping - Mr. Sudesh Malla

3) Third Environmental Impact Assessment (EIA) Training Course

From July 20th to August 21st, 2000, a total of 22 trainees participated from Kaligandaki "A" HEP (Nepal Electricity Authority), Multi Disciplinary Consultant Pvt. Ltd., Department of Cottage and Small Industries, Department of Industry, Nepal Bureau of Standard and Metrology, Department of Mining and Geology, TAEC Consultants Pvt. Ltd., Middle Marsyangdi HEP (Nepal Electricity Authority), Ministry of Local Development, Department of Electricity Development, Agriculture Projects Services Centre (APROSC) Pvt. Ltd., The East Foundation, The Mountain Institute, Samakushi, and School for Environmental Management and Sustainable Development.

The sessions conducted by the EIA team were:

- An Introduction to EIA and Interaction Programs - Dr. R.B. Khadka
- Why Bother about the Environment? - Dr. Stefan Gorzula
- EIA in International Perspective - Dr. Ram B. Khadka
- EIA is Frequently a 2-sided Coin - Dr. Stefan Gorzula
- Introduction to Scoping and Methods of Scoping - Mr. Sudesh Malla
- Scoping Requirements in Nepal and TOR Preparation - Mr. Sudesh Malla
- Group Activity in Scoping - Mr. Sudesh Malla
- Introduction to Impact Identification - Dr. Ram B. Khadka
- Methods of Impact Identification and Assessment - Dr. Ram B. Khadka
- Introduction to Impact Prediction and Methods of Impact Prediction - Dr. Ram B. Khadka
- Examples of Comparison of Alternatives - Dr. Ram B. Khadka

4) Fourth Environmental Impact Assessment (EIA) Training Course for Irrigation Sector

From November 1st to 30th, 2000, a total of 19 trainees participated from various sections of the Department of Irrigation of the Ministry of Water Resources.

The sessions conducted by the EIA team were:

- An Introduction to EIA and Interaction Programs - Dr. R.B. Khadka
- Identifying Possible Issues for Scoping of Model Irrigation Project - Dr. Ram B. Khadka
- Scoping and TOR Preparation - Dr. Ram B. Khadka
- Baseline Data in the Context of EIA Study - Dr. Ram B. Khadka
- Methods of Data Collection for Baseline Information on Environmental Settings - Dr. Ram B. Khadka.
- Examination of Some Reports on EIA of Irrigation Projects - Dr. Ram B. Khadka
- An Overview of EIA in Water Resource Projects - Dr. Stefan Gorzula
- Impacts on Social and Cultural Resources - Dr. Don Messerschmidt
- Multi-purpose Water Resources Development Projects - Mr. Lee Wang

5) Fifth Environmental Impact Assessment (EIA) Training Course

From January 15th to 25th, 2001, a total of 19 trainees participated from Nepal Environment and Scientific Society (NESS), Women Development Foundation of Nepal (WDFN), CRTW, IRCDC, WOSEC, Society of Local Volunteers' Effort (SOLVE), Everest Mountain Training Centre, Nepal Environmental Journalist Group (NEFEJ), Nepal Metal Company Ltd. (NMCL), East Consult, CEMAT Consultants, Centre for Environmental and Agricultural Policy Research, Extension and Development (CEAPRED), Renaissance Society Nepal, Nepal Planning Commission, Ministry of Forests and Soil Conservation, Women Environment Protection Committee (WEPCO), and Ministry of Water Resources.

The sessions conducted by the EIA team were:

- Screening and Scoping and IEE in Relation to a Hypothetical Case - Dr. Ram B. Khadka

6) Sixth Environmental Impact Assessment (EIA) Training Course

From September 19th to October 3rd, 2001, a total of 22 trainees participated from Pro Public (Forum for Protection of Public Interest), Department of Cottage and Small Industries, Ministry of Industry - Commerce and Supply, Department of Industry, Department of Electricity Development, School for Environmental Management and Sustainable Development, Nepal Environment and Scientific Society (NESS), Ministry of Population and Environment, Sustainable Development Fund, Department of Minerals, Mines and Geology, Institute for Integrated Development Studies (IIDS), and ECO Nepal.

The sessions conducted by the EIA team were:

- Why bother about the Environment? - Dr. Stefan Gorzula
- The Evolution of EIA - Dr. Stefan Gorzula
- EIA Principles and Processes - Dr. R.B. Khadka
- Introduction to Scoping - Dr. Stefan Gorzula
- Scoping Requirements in Nepal and TOR Preparation - Mr. Sudesh Malla
- Discussion on Scoping - Dr. R.B. Khadka
- Public Participation in EIA and Stakeholders - Dr. Don Messerschmidt and Mr. Bharat Sharma
- Baseline Data Collection in the Context of EIA Study - Dr. Ram B. Khadka
- Methods of Impact Identification, Impact Assessment and Impact Evaluation - Dr. Ram B. Khadka
- EIA is Frequently and Two Sided Coin - Dr. Stefan Gorzula
- Impact on Social and Cultural Resources - Dr. Don Messerschmidt and Mr. Bharat Sharma
- Uncertainty in EIA Prediction, Cumulative Impacts - Dr. Ram B. Khadka
- EIA Report Formats - Mr. Sudesh Malla
- Environmental Management Plan (EMP) - Mr. Lee Wang
- EIA Report Review - Mr. Sudesh Malla and Dr. Ram B. Khadka
- Islands in the Sky - Dr. Stefan Gorzula
- Executive Summary of EIA - Dr. Ram B. Khadka
- An Overview of the Hydropower Industry in Nepal

B) Other Training

7) The World Bank Process for EIAs.

On 27 September, 2000, a total of 19 officials participated from the Department of Electricity Development, the Ministry of Water Resources, Nepal Electricity Authority, METCON Consultants, SEAGATE, the School for Environmental Management and Sustainable Development, NORPLAN, International Resources Group, and the US Agency for International Development.

8) One-day Training Course on EIA (Blue Star Hotel, 2 October 2000).

On 2 October, 2000, a 7 trainers from EIA team gave an intensive training course to 7 staff of the Department of Electricity Development.

Annex 4.2.e - Field Trips to Existing Projects and Public Hearings

A) Existing Projects

1) Andi Khola: In early January 1999 Dow Nichol, Stefan Gorzula, and Richard English of IRG, Anup Upadhyay of EDC, and Hom Lal Shrestha of USAID visited the project site and rural electrification areas.
2) Kulekhani I and II: In May 1999 Dow Nichol and Stefan Gorzula of IRG, Bharat Sharma and Govind Ghimire of METCON, and Sudesh Malla of EDC visited the Kulekhani Reservoir and the Kulekhani I and II power stations of NEA.
3) Bhote Koshi: In August 199 Dow Nichol and Stefan Gorzula of IRG, Oswaldo Juvier of DE&S, and Tony Carvalho of USAID visited the construction site of the Upper Bhote Koshi Hydroelectric Project.
4) Middle Marsyangdi: In November 2000, Stefan Gorzula, John Bizer, and Sudesh Malla made a site visit to the Marsyangdi Hydroelectric Project.
5) First Marsyangdi: Don Messerschmidt and Bharat Sharma made a 2-day field trip to the first Marsyangdi Hydroelectric Power Project impact area, in Tanahun and Gorkha Districts, central Nepal, in January 2001.
6) Modi Khola: and Kaligandaki "A": From March 21 to 23, 2001, Don Messerschmidt and Bharat Sharma visited the Modi Khola and the Kaligandaki "A" hydroelectric projects.
7) Middle Marsyangdi: Don Messerschmidt, Bharat Sharma and Govind Ghimire made a 2-day field trip to the Middle Marsyangdi Hydroelectric Power Project impact area, in Tanahun and Gorkha Districts, central Nepal, in April 2001.

B) Public Hearings

1) Lalpur-Gaddachowki 132 kV T/L public hearing in April 1999.
2) LEDCO held public hearing for Nyadi Hydropower Project Scoping document on April 3, 1999.
3) Sudesh Malla and Stefan Gorzula attended a public hearing at the reservoir site of the West Seti Hydropower Project in July 1999.
4) Sudesh Malla and Stefan Gorzula attended a public hearing at the transmission lines site of the West Seti Hydropower Project in July 1999.
5) LEDCO held public hearing for Nyadi Hydropower Project EIA report on December 19, 1999
6) Raj Kumar Shrestha (DOED) attended a public hearing for Lower Modi Hydropower Project on 15 September 2000.
7) Sudesh Malla, and other DoED officials, Ram Khadka, and officials from MOWR and MOPE attended a public hearing for Upper Modi Hydropower Project on 25 September 2000.
8) Raj Kumar Shrestha (DOED) attended a public hearing for the Pathalaiya - Parwarripur 132 kV T/L in September 2000.
9) Chatur Bdr. Shrestha (DOED) attended a public hearing for the Syuchatar - Budhanilkantha 132 kV T/L Project in February, 2001.
10) Raj Kumar Shrestha (DOED) attended a public hearing for Middle Marsyangdi Hydroelectric Project in February 2001.
11) Chatur Bdr. Shrestha (DOED) attended a public hearing for the Kulekhani III Hydropower Project in February 2001.
12) Chatur Bdr. Shrestha (DOED) attended a public hearing for the Langtang Khola Hydropower Project in March 2001.

Annex 4.2.f - EIA Documents Reviewed by DOED

1) Terms of Reference for Initial Environmental Examination

a) Hydropower Projects

i) Private Sector

- Daramkhola Hydroelectric Project (TOR) in May, 2000.
- Mailun Khola Hydropower Project (TOR) in September 2000.
- Piluwakhola Hydroelectric Project TOR in January 2000.
- Sunkoshi Small Hydoelectric Project (TOR) in October 2000.
- Hewa Khola Hydropower Project, including 33 kV T/L (TOR) in December 2000.
- Lower Indrawati Hydroelectric Project (TOR) in August 2001.
- Ridikhola Small Hydropower Project (TOR) in September 2001.

ii) Public Sector

- None.

b) Transmission Lines

i) Private Sector

- Indrawati III - Panchkhaal 66 kV T/L Scoping Document in March 1999.
- Indrawati III - Panchkhaal 66 kV T/L TOR in September 1999.
- 33 kV T/L for Sunkoshi Small Hydoelectric Project (TOR) in January 2001.

ii) Public Sector

- Kavre 33 kV sub-T/L and 33/11 kV sub-station project (TOR) in September 2000.
- Lalitpur 33kV sub-station T/L and 33/11 kV sub-station project (TOR) in January 2001.
- Rural Electrification Scheme (8 Districts of Eastern Development Region) Project (TOR) in May 2001.
- Rural Electrification Scheme Project - Ramchhap, Sindhuli, Mahottari, Sarlahi, Rantahat, Parsa - (TOR) in July 2001.
- Rural Electrification Scheme Project - Kaski, Kapilvastu, Rupendehi, Tanahu - (TOR) in July 2001.
- Rural Electrification Scheme Project - Nuwakot, Chitwan, Nawalparasi - (TOR) in July 2001.
- Rural Electrification Scheme Project - Dhanusa, Morang, Jhapa, Bara - (TOR) in July 2001.
- Rural Electrification Scheme Project - Dang, Banke, Bardiya - (TOR) in July 2001.
- Rural Electrification Scheme Project - Parbat, Lamjung, Palpa - (TOR) in July 2001.

2) Initial Environmental Examination Report

a) Hydropower Projects

i) Private Sector

- None.

ii) Public Sector

- Piluwakhola Hydroelectric Project IEE Report in June, 2000.
- Belkhu Khola Small Hydroelectric Project IEE report in September, 2000.
- Mailun Khola Hydropower Project IEE Report in January 2001.
- Sunkoshi Small Hydoelectric Project IEE Report in March 2001.
- Hewa Khola Hydropower Project, including 33 kV T/L IEE Report in May 2001.

b) Transmission Lines
   i) Private Sector
      - Indrawati III - Panchkhaal 66 kV T/L IEE Report in January 2000.
   ii) Public Sector
      - Kavre 33 kV sub-T/L and 33/11 kV sub-station project IEE Report in June 2001.

3) Scoping Document for EIA

a) Hydropower Projects
   i) Private Sector
      - Nyadi Hydroelectric Project in June 1999.
      - Thulo Dhunga Hydroelectric Project in June 1999.
      - Lower Modi Khola Hydroelectric Project in February 2000.
      - Upper Modi Khola Hydroelectric Project in February 2000.
      - Madi-1 Hydroelectric Project in February 2000.
      - Trishuli Khola Hydroelectric Project in March 2000.
      - Khudi Hydroelectric Project in July 2000.
      - Lantang Khola Hydroelectric Project in September 2000.
      - Indrawati III Hydroelectric Project in January 2001.
      - Upper Madi Hydroelectric Project in April 2001.
   ii) Public Sector
      - Kulekhani III Hydroelectric Project in April 2000.
      - Middle Marsyangdi Hydroelectric Project in June 2000.
      - Pancheswor Multipurpose Project in June 2000.
      - Upper Modi "A" Hydroelectric Project in August 2000.
      - Upper Seti Storage Hydropower Project in April 2001.
      - Upper Tamakoshi Hydroelectric Project in May 2001.
      - Chameliya Hydroelectric Project in July 2001.

b) Transmission Lines
   i) Private Sector
      - None.
   ii) Public Sector
      - Bheri-Babai Hydroelectric Project in December 1998.
      - Lalpur-Gaddachowki 132 kV T/L in November 1998.
      - Hetauda-Bardaghat 220 kV T/L in November 1998.
      - Syuchatar-Budanilkantha 132 kV T/L in November 1998.
      - Marsyangdi-Pokhara 132 kV T/L in February 1999.
      - Chepang-Kohalpur 132 kV T/L (Bheri-Babai HP) in August 1999.
      - Pathalaiya-Parwanipur 132 kV T/L in December 1999.
      - Revised (route changed) Syuchatar-Budanilkantha 132 kV T/L in April 2000.
      - Middle Marsyangdi - Lower Marsyangdi 132 kV T/L in August 2000.
      - Jagatpur - Madi 33 kV sub-T/L Project in December 2000.

4) Terms of Reference for EIA

a) Hydropower Projects
   i) Private Sector
      - Nyadi Hydroelectric Project in June 1999.
      - Thulo Dhunga Hydroelectric Project in June 1999.
      - Lower Modi Khola Hydroelectric Project in February 2000.
      - Upper Modi Khola Hydroelectric Project in February 2000.
      - Madi-1 Hydroelectric Project in February 2000.
      - Trishuli Khola Hydroelectric Project in March 2000.

- Khudi Hydroelectric Project in July 2000.
- Lantang Khola Hydroelectric Project in September 2000.
- Indrawati III Hydroelectric Project in January 2001.
- Upper Madi Hydroelectric Project in April 2001.

ii) Public Sector
- Kulekhani III Hydroelectric Project in April 2000.
- Middle Marsyangdi Hydroelectric Project in June 2000.
- Pancheswor Multipurpose Project in June 2000.
- Upper Modi "A" Hydroelectric Project in August 2000.
- Upper Seti Storage Hydropower Project in April 2001.
- Upper Tamakoshi Hydroelectric Project in May 2001.
- Chameliya Hydroelectric Project in July 2001.

b) Transmission Lines

i) Private Sector
- None.

ii) Public Sector
- Bheri-Babai Hydroelectric Project in January 1999.
- Hetauda-Bardaghat 220 kV T/L in February 1999.
- Syuchatar-Budanilkantha 132 kV T/L in February 1999.
- Lalpur-Gaddachowki 132 kV T/L in March 1999.
- Chepang-Kohalpur 132 kV T/L (Bheri-Babai HP) in August 1999.
- Revised (route changed) Syuchatar-Budanilkantha 132 kV T/L in April 2000.
- Middle Marsyangdi - Lower Marsyangdi 132 kV T/L in August 2000.
- Jagatpur - Madi 33 kV sub-T/L Project in December 2000.

5) EIA Report

a) Hydropower Projects

i) Private Sector
- West Seti Hydropower Project EIA in September 1999.
- Nyadi Hydroelectric Project in October 1999.
- Upper Modi Khola Hydroelectric Project in December 2000.
- Lantang Khola Hydroelectric Project in April 2001.
- Khudi Hydropower Project in May2001.
- Madi "I" Hydroelectric Project in July 2001.

ii) Public Sector
- Middle Marsyangdi Hydroelectric Project in October 1999 (not according to the Regulation).
- Khulekhani III Hydroelectric Project in May 2001.
- Middle Marsyangdi Hydroelectric Project in June 2001 (according to regulation).
- Upper Modi "A" Hydroelectric Project in July 2001.

b) Transmission Lines

i) Private Sector
- None.

ii) Public Sector
- Lalpur-Gaddachowki 132 kV T/L in September 1999.
- Hetauda-Bardaghat 220 kV T/L in September 1999.
- Pathalaiya-Parwanipur 132 kV T/L Project in May 2001.
- Sinchatar-Budhanilkantha 132 kV T/L Project in May 2001.

Annex 4.2.g - Review Meetings Attended By DOED and EIA Team Members

1. Sudesh Malla, and other DOED officials, attended public consultation meeting for scoping in Kathmandu for the Bheri-Babai Hydropower Project in September 1998.
2. Sudesh Malla attended a public meeting for the EIA reports of Kabeli A, Likhu IV, Rahughat, and Budhi Ganga (all four MHSP projects: not reviewed according to EPR) in November 1998.
3. Sudesh Malla and Ram Khadka attended a review meeting of the scoping document of the Bheri-Babai Hydropower Project in January 1999.
4. Sudesh Malla attended a review meeting of the scoping document for Lalpur-Gaddachowki 132 kV T/L in February 1999.
5. Sudesh Malla attended a review meeting of the scoping document for the Hetauda-Bardaghat 220 kV T/L in February 1999.
6. Sudesh Malla attended a review meeting of the TOR for Lalpur-Gaddachowki 132 kV T/L in April 1999.
7. Sudesh Malla attended a review meeting of the TOR for the Hetauda-Bardaghat 220 kV T/L in June 1999.
8. Sudesh Malla and Ram Khadka attended a review meeting of the TOR of the Bheri-Babai Hydropower Project in June 1999.
9. Sudesh Malla attended a review meeting of the scoping and TOR documents of the Nyadi Hydropower Project in September 1999.
10. Ram Khadka and Sudesh Malla attended a review meeting (Kathmandu) for the West Seti Hydropower Project in November 1999.
11. Sudesh Malla attended a review meeting of the scoping document and TOR of the Thulo Dhunga Hydropower Project in November 1999.
12. Sudesh Malla attended a review meeting of the EIA report of the Nyadi Hydropower Project in December 1999.
13. Sudesh Malla attended a review meeting of the EIA report for Lalpur-Gaddachowki 132 kV T/L in December 1999.
14. Sudesh Malla attended a review meeting of the scoping and TOR documents of the Lower Modi Khola Hydropower Project in March 2000.
15. Sudesh Malla attended a review meeting of the scoping and TOR documents of the Upper Modi Khola Hydropower Project in April 2000.
16. Sudesh Malla attended a review meeting of the scoping and TOR documents of Chepang-Kohalpur 132 kV T/L in April 2000.
17. Dillip Sadaula (DOED) attended review meeting of the Scoping for Madi-1 Hydroelectric Project in May 2000.
18. Dillip Sadaula (DOED) attended review meeting of the TOR for Madi-1 Hydroelectric Project in August 2000.
19. Sudesh Malla (DOED) attended a review meeting of scoping and TOR documents of the Langtang Khola Hydroelectric Project in January 2001.
20. Sudesh Malla (DOED) attended a review meeting of scoping and TOR documents of the Upper Modi "A "Hydroelectric Project in January 2001.
21. Sudesh Malla (DOED) attended a review meeting of scoping and TOR documents of the Pancheswor Multipurpose Project in January 2001.
22. Sudesh Malla (DOED) attended a review meeting of scoping and TOR documents of the Kulekhani III Hydroelectric Project in January 2001.
23. Chatur Bdr. Shrestha (DOED) attended a review meeting of the Scoping and TOR documents of the Indrawati III Hydropower Project in March 2001.
24. Chatur Bdr. Shrestha (DOED) attended a review meeting of the Scoping and TOR documents of the Middle Marsyangdi Hydropower Project in March 2001.
25. Chatur Bdr. Shrestha (DOED) attended a review meeting of the Scoping and TOR documents of the Jagatpur - Madi 33 kV T/L Project in March 2001.
26. Sudesh Malla (DOED) attended a review meeting of the EIA report of the Upper Modi Hydroelectric Project in May 2001.
27. Chatur Bdr. Shrestha (DOED) attended a review meeting of the Scoping and TOR documents of Trishuli Khola Small Hydropower Project in August 2001.