DECENTRALIZED RURAL INFRASTRUCTURE AND LIVELIHOODS PROJECT - NEPAL

ENVIRONMENTAL ASSESSMENT AND REVIEW PROCEDURES

INTRODUCTION

1. The following Environmental Assessment and Review Procedure (EARP) Report aims to describe: i) the potential environmental impacts that could result from undertaking the Decentralized Rural Infrastructure and Livelihoods Project (DRILP) in Nepal; ii) the proposed mitigation measures to avoid such impacts; iii) the current environmental assessment procedures and capacities of the relevant agencies of HMGN; and finally iv) the approaches to be adopted during implementation of DRILP to ensure that environmental aspects of the Project are dealt with in a comprehensive manner.

2. The EARP is based on the findings and recommendations of a project preparatory study[1] conducted by ADB and HMGN in preparation of the DRILP.

OVERVIEW OF TYPE OF SUBPROJECTS TO BE ASSESSED

Description of the Project

3. The DRILP is a sector-like project, which aims to reduce rural poverty in hill and mountain areas of Nepal by extending the network of rural transport infrastructure and improving small, community level socio-economic infrastructure. At the same time it will provide employment, empower rural communities, increase institutional capacity, and improve accountability and transparency, so that the investment in construction and rehabilitation of infrastructure results in sustainable improvements. The project components are described in greater detail below.

4. **The Rural Transport Infrastructure Sub-projects:** These will comprise: (a) the construction of new, and the rehabilitation of existing, District Roads (up to 20 km in length for new and up to 30 km in length for rehabilitation) and Village Roads (up to 15 km in length for new and up to 20 km in length for rehabilitation) including the provision of small cross-drainage structures up to 6m span, small bridges up to 20m span, and all necessary protection structures; (b) the rehabilitation and upgrading of existing Main Trails (up to 50 km in length), including necessary construction of Trail Bridges; and (c) construction of new Trail Bridges on existing Main Trails in order to extend the access that the trails provide or to allow a more direct access route. New construction of a road is defined as where there is no existing motorable route although there is likely to be a walking track. Rehabilitation is defined as where a road has previously been constructed, but due to poor standards or lack of maintenance significant parts of it are not motorable. It is envisaged that the project investments in rural transport infrastructure will be predominantly in motorable roads.

5. **Rural Livelihood Enhancement:** This component consists primarily of community-level infrastructure to supplement main sub-project investments, including: improvement of village trails (up to 10 km in length) and construction of pedestrian bridges on such trails (maximum span of 80 m); construction of new and rehabilitation of existing, clean water supplies (maximum size of 200 persons per scheme); rehabilitation of small irrigation schemes (maximum size of 25 ha); micro-hydro power (maximum size of 10kW); construction of market buildings (maximum size of 125 sq.m.) or community buildings (maximum size of 100 sq. m.); construction of new, or rehabilitation and improvement of

[1] ADB TA 3625-NEP: Project Preparation Technical Assistance for the Second Rural Infrastructure Development Project, **??** 2001 – January **?** 2003.

existing, health sub-posts (maximum size of 100 sq.m.) and primary school buildings (maximum size of 32 sq.m. per classroom). In addition the component includes community development through information dissemination and social mobilization programs; employment of local - especially poor and marginalized - people on the main sub-project construction sites, and access to wider development opportunities through facilitation of savings and credit schemes.

6. **Capacity Building:** strengthening the management and monitoring capacity of local government bodies at district and village level, and the private and NGO sectors, to plan, design, construct, operate and maintain rural roads and other infrastructure in order to achieve a sustainable impact on poverty reduction. The project will also strengthen the capacity of the Ministry of Local Development (MoLD) and its Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR) to provide overall guidance, direction and monitoring for management of the rural infrastructure sector. This will include strengthening environmental management capacity.

7. The main project investments will be made in 18 very poor hill and mountain districts - four districts in the far western region, six in the mid western region, four in the western region, and four in the central/eastern region. However, the DRILP will contribute to building capacity at national level as well as in the project area.

Potential Impacts and Proposed Mitigation Measures

8. The largest part of the DRILP expenditure will be on the provision of rural infrastructure. The environmental impacts of these schemes depend on their type, size, and location. Potential impacts and possible mitigation measures are described below. New construction, rehabilitation and upgrading of the trails, trail bridges, school and community buildings, and health posts is not likely to have significant adverse impacts on the environment. These sub-projects are, therefore, generally exempted from formal environmental appraisal under the HMGN Environmental Rules. However, screening, monitoring and other necessary mechanisms will be put in place under the DRILP to ensure that they are planned and constructed in an environmentally sound manner.

Construction Activities

9. Construction activities will mainly include clearing, excavation, filling, disposal of spoil, and masonry works. Conventional methods of infrastructure development on hilly or mountainous areas without due consideration to environmental impacts, could result in a number of adverse impacts. Firstly, construction activities can increase the possibility of landslides and soil erosion. The entire hilly terrain of Nepal is considered physically fragile and subject to risk of landslides, erosion and slope instability. These are common occurrences, both naturally and as a result of infrastructure development in the hilly and mountain areas. Secondly, the conventional method of ‘cut-through’ construction can result in degradation of agricultural lands, loss or degradation of vegetation, forests or wildlife and damage to private property, including houses and commercial buildings. Thirdly, existing local infrastructure such as water supply lines, irrigation canals, and walking trails are at risk of damage during construction. Fourthly, construction of small-scale water supply and irrigation or micro-hydro projects could create temporary pollution effects downstream.

Use of Local Labor

10. The DRILP will use Building Groups, employing local people, as the main modality for implementing construction works. This is expected to have positive economic, social and environmental impacts. However, local workers generally lack an understanding of

environmentally sound construction methods and practices. Major accidents and occupational safety problems are not anticipated, as construction work will rely on labor-based methods as opposed to blasting and other risky techniques. However, there is a risk of minor accidents such as falling from heights. Water and sanitation related diseases are the main public health problem in the DRILP districts. Open field defecation is common practice, and there is a risk that pollution due to improper sanitation practices will increase around the construction sites. This may increase incidents of water and sanitation-related diseases, particularly gastro-intestinal disorders.

Induced Impacts from Improved Access

11. It is expected that DRILP will lead to increasing the incomes of the rural people, particularly the poor, since:

- Improved transport infrastructure will provide better access to economic opportunities and to basic social services;
- Supplementary investments will promote efficient and productive use of local resources;
- Social mobilization activities and increased capacity of local institutions will create the framework for provision of outreach activities and extension services from various agencies; and
- All of the above will stimulate crop diversification, cash crop production and new employment opportunities, which will benefit the poor.

12. While these desirable and positive impacts provide the rationale for the DRILP, improved access may also induce negative impacts. For example, improved access to remote and rural interior areas could lead to exploitation of natural resources in an illegal or uncontrolled manner. There are other potential negative impacts that could be induced by improved access, such as the spread of HIV/AIDS and other sexually transmitted diseases, increased trafficking of young girls, and pollution due to uncontrolled and improper use of chemical fertilizers and pesticides as these become more easily accessible. The extent, to which these impacts will occur in practice, and the significance of possible negative impacts, is not known at this stage and will be influenced by various factors including the capacities of local institutions to perform their tasks effectively.

Proposed Mitigation Measures

13. The main strategy of DRILP to address the potential environmental impacts mentioned above is adopting labor-based, environmentally sound, principles (LEP) in planning and implementing construction works. This approach aims to internalize environmental considerations to the extent possible. The main technical features of the LEP approach are:

a) *Phased construction*: This is applicable in case of roads. Construction will be spread over a three-year period of construction seasons outside the monsoon. A track of about 1.5m will be opened in the first year and the width will be widened progressively in the following years, and the necessary structures constructed.

b) *Road alignment*: As part of the phased construction process, DRILP will give emphasis to the careful selection of the horizontal and longitudinal alignment prior to the start of the first construction phase. As a rule of thumb, the alignment of the road

should be chosen such that the centre line is close to the surface of the hill slope resulting in low cut slope.

c) *Balancing cut and fill*: DRILP will encourage and emphasize planning and design of sub-projects aiming to have cut and fill balanced. A complete balance of cut and fill may not always be practical or possible in which case excess spoils will be placed in pre-identified and approved safe tipping sites.

d) *Blasting*: As a general rule, blasting will not be allowed. As much as possible, rocky portions need to be avoided by choosing an alternative alignment. If rocky areas cannot be avoided, then technologies other than blasting can be used (*i.e.* drilling, heating and cooling, and rock cutting). In exceptional cases only, when there is no other option, controlled blasting may be permitted. However it must meet the following conditions: there must be independent technical justification proving that all the possible routes have been explored; it must be a limited section only; it must be proved that there are no other technical options; and DoLIDAR must approve it. The controlled blasting must be performed by a separate, skilled team only (not by the users), and generally it should be done after completion of all other road sections.

e) *Appropriate structures*: Structures will be built on the basis of actual need determined on site, rather than on prepared designs. Standard drawings are used as the basis for choice of structure type, which should always be the lowest cost option that will serve the function required. For example, dry stone walls are favoured over gabions, and gabions over concrete masonry; and scuppers are favoured over Hume pipe culverts.

f) *Bio-engineering*: DRILP will integrate the use of vegetation in combination with simple civil engineering structures such as gabion walls and simple drains to give the best overall slope protection and shallow stabilisation.

14. Successful implementation of the LEP approach depends crucially on maintaining an adequate level of technical supervision by qualified technicians through continuous presence at site. The environmental objectives of adopting the LEP approach may not be achieved in the absence of proper guidance and monitoring. The institutional and implementation arrangements defined for the DRILP, as described in Section D below, aim to ensure that sufficient emphasis is given to these aspects.

15. The DRILP will organize awareness and orientation programs on LEP approaches for the Building Groups and contractors before awarding work to them, and will provide intense technical support and supervision through continuous presence of technicians on site, particularly during the initial stages of construction. Environmental aspects will also be included in DRILP's overall awareness raising and training activities. This is intended to overcome the general lack of environmental awareness at the local level. The environmental activities will target different actors, including elected representatives, political parties, DDC and VDC staff, technicians and communities. The programs will aim to sensitize stakeholders to opportunities and risks associated with improved access, and the need for concerted and appropriate responses.

16. Under the capacity building component, DDCs, DoLIDAR and MoLD will be assisted to build capacity to perform their respective environmental responsibilities, defined by the environmental legislation. In particular, DDCs will be supported to undertake screening, preparation of ToR for IEEs, commissioning studies, and carrying out mitigating works. DoLIDAR will be supported to provide back-up support to DDCs in doing their tasks and advising MoLD as necessary. MoLD will be supported to review and approve ToR and

environmental assessment reports, and conduct monitoring of environmental aspects. The involvement of district staff in carrying out environmental activities is one way that will help to build human resources at district level. Practical, on-the-job training on the Initial Environmental Examination (IEE) procedure at district level will be provided.

17. The DRILP will take a collaborative and coordinated approach to strengthening the environmental capacity of the concerned stakeholders. For example, at present, there are a number of donor-supported projects active in the rural infrastructure sector in Nepal. Besides, the ADB grant-financed AOTA that is being prepared to support the institutional strengthening of DoLIDAR, and the DFID-financed Local Governance Strengthening Program (LGSP), include elements to contribute to strengthening the capacities of central and local agencies for environmental tasks. There is an obvious need for co-ordination and collaboration by all concerned to avoid duplication. DRILP will assist with such co-ordination whenever possible.

18. Arrangements will be made to establish and carry out an independent monitoring program at the project-level during implementation, as discussed further in Section D4 below. Finally, to address the issue of improper sanitation practices by workers, hygienic latrines will be provided on-site, and workers will be educated in proper sanitary practices.

COUNTRY'S ENVIRONMENTAL ASSESSMENT AND REVIEW PROCEDURES

19. The basic legal framework for environmental appraisal and mitigation in Nepal are founded in the Environmental Protection Act 2053 (1996) and the Environmental Protection Rules 2054 (1997), revised 2055 (1999) and supported by provisions in other acts such as the Forest Act, the National Parks and Wildlife Conservation Act, and the Local Self-Governance Act. National Environmental Impact Assessment Guidelines and some sectoral guidelines have been prepared. These are either endorsed, or awaiting endorsement, by the Council of Ministers; however the main points of the guidelines are already incorporated in the Rules however. Salient features of the legal provisions for environmental appraisal and mitigation are:

- Projects that have potential to create significant environmental impacts are required to undergo an environmental assessment. Typical projects that require EIAs or IEEs are listed in Annex 1.
- The project proponent is responsible for commissioning the environmental appraisal (IEE or EIA study[2]).
- The ToR for, and report of, an IEE and EIA must be approved by the responsible Ministry and the Ministry of Population and Environment (MoPE) respectively.
- The population likely to be affected, and other concerned stakeholders, must be consulted as part of the IEE and EIA processes. A public hearing at site is required in the case of an EIA.
- Implementation of mitigation measures capsulated in the environmental management plan is the responsibility of the project proponent.
- Monitoring is the responsibility of the concerned line Ministry.

20. Accordingly, an IEE is sufficient for the main sub-projects envisaged in DRILP. The DRILP sub-project Eligibility Criteria described in Section D below, are intended to eliminate any schemes that are either above the defined threshold of potential environmental impacts

[2] IEE: Initial Environmental Examination
EIA: Environmental Impact Assessment

which warrant an EIA, or are located in defined environmentally sensitive areas. Trails, trail bridges, school buildings and community buildings do not require a formal IEE or EIA, and therefore are generally exempted from environmental appraisal requirement, though such schemes will be environmentally screened as part of the DRILP planning and selection process.

SPECIFIC PROCEDURES TO BE USED FOR SUBPROJECTS

Responsibilities and Authorities

21. The Ministry of Population and Environment (MoPE) has overall responsibility for environmental assessment and policy matters. The Ministry of Local Development (MoLD), District Development Committees (DDCs), and the Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR) are the institutions directly involved in the IEEs of DRILP funded sub-projects. The roles of these institutions are described below.

22. **Ministry of Population and Environment (MoPE)**: MoPE was established in 1995 and is the main institution mandated to formulate and implement environmental policies, plans and programs at the national level. It is also charged with the responsibility for preparing and issuing environmental regulations and guidelines; development and enforcing environmental standards and pollution control measures; commissioning environmental research and studies; and monitoring programs implemented by other agencies. With regard to environmental assessments, MoPE gets involved only when an EIA is required. In such cases, MoPE is responsible for reviewing and issuing final clearance on the TORs and EIA study reports. MoPE has accumulated some experience over time, and now has reasonable capacity to undertake all aspects of processing and approving EIAs.

23. **Ministry of Local Development (MoLD)**: As the concerned line ministry, MoLD is responsible for review and final approval of ToRs and study reports of IEEs, and for managing environmental monitoring. MoLD has recently established an Environmental Management Section (EMS), which became effective in March 2001. EMS is mandated with overall environmental responsibility of the Ministry. Its working relationship with other institutions will gradually evolve as its mandate becomes clearer. As currently envisaged, its full scope of responsibility is quite wide, although the section has not yet started works in all of those areas. The section is nascent, very small and has only two officer level staff (one under-secretary and one section officer) plus two non-officer level staff. All the staff have administrative backgrounds, but no training or experience in environmental subjects. The section has not carried out any review or approval of IEEs to date. Furthermore, the section has extremely limited capacity to process and approve the IEE measures.

24. **Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR)**: As a central level technical department which aims to facilitate and support DDCs, DoLIDAR is responsible for providing back-up support to DDCs in carrying out their tasks and advising MoLD as necessary. DoLIDAR is also a relatively new institution, which is adjusting gradually to improve its effectiveness. At present environmental assessment responsibilities are placed under the jurisdiction of the Planning, Monitoring and Donor Coordination Section, which has three professional staff: one Divisional Engineer, one Civil Engineer and one Agricultural Engineer. No one in the Department has practical experience of carrying out environmental appraisals, reviews or monitoring. The only experience of the Department with environmental appraisals is on donor-supported projects, where external consultants have carried out the actual work. There is one person in the Department with formal training/education in environmental management. The Department's engineers are generally aware of the need for environmental appraisal as a result of environmental topics

included in various training programs they have attended. However, the knowledge and skill imparted to them through such training programs were limited.

25. **District Development Committees (DDC)**: As owners or proponents of sub-projects, DDCs are responsible for screening and ToR preparation, commissioning IEE studies, hosting public consultations and disclosing information on IEEs and carrying out mitigating works. The capacity of the DDCs to undertake IEEs of sub-projects by themselves is extremely low. None of the nine DDCs where DRILP investments are proposed has any staff trained in environmental appraisal. Furthermore, none of these districts has carried out any IEE as prescribed in the Environmental Protection Rules; however a few have used consultants hired under donor-funded projects to prepare sections on environmental impacts for feasibility study reports of rural infrastructure schemes. Human resources capable and trained to carry out IEEs are hard to find in the districts, even outside the DDCs.

26. **Private Sector:** Several private consultancy firms are capable of carrying out IEEs of the sub-projects envisaged under DRILP. These firms have experience of conducting IEEs of various types of project such as irrigation, roads, hydropower, transmission lines and industries. Most of these companies however are located in Kathmandu, not in the districts. Furthermore, only a few of them have permanent staff trained in environmental assessment. They generally recruit short-term consultants for the environmental appraisal. Therefore, the real capacity lies with the individual consultants rather than the companies.

Environmental Criteria of Subproject Selection

27. The following environmental criteria are proposed in order to promote internalization of the environmental considerations throughout the sub-project cycle. Any DRILP sub-project requiring a full Environmental Impact Assessment (EIA) under HMGN regulations will be eliminated through the following sub-project eligibility criteria. This is because of the low-level of environmental capacity of the agencies directly involved. The criteria are further described below.

i. Avoid defined environmentally sensitive areas (such as National Parks and Conservation Areas and other designated sensitive areas);

ii. Subprojects requiring a full EIA (as per Annex 1) would not be eligible;

iii. Subproject should be limited to the maximum size for respective types of subprojects, as indicated in Annex 2;

iv. Subprojects requiring IEEs must follow the EA procedures outlined in this report;

v. Subprojects exempt of IEE must still be subject to screening, planning, design and monitoring mechanisms.

vi. Consideration of any proposed small-scale water supply, irrigation or micro-hydro subproject is contingent on availability of a reliable supply and should have no negative impact on other users or on the ecosystem downstream;

Procedures for Environmental Assessment of Subprojects

28. The DRILP is a decentralized, ‘process project’ with the DDCs as the ‘project owners’. Sub-project investments will be identified, prioritized, appraised and approved through a decentralized and participatory process managed by the DDCs, but subject to checking by DoLIDAR of compliance with DRILP requirements, including environmental requirements.

29. Environmental considerations are taken into account from the initial stage of sub-project selection and planning rather than subjecting sub-projects that have already been designed to environmental assessments. This highlights the strategy to internalize environmental considerations from an early stage of the sub-project cycle.

30. The sub-project selection and planning process comprises of: identification, prioritization, appraisal through feasibility study, and approval. The measures proposed to ensure this during sub-project selection and design are: i) eligibility criteria for selection of subprojects; ii) use of environmental guidelines for planning, design and implementation; and (iii) individual examination of sub-projects for potential impacts on the environment. The eligibility criteria for selection of sub-projects were described in the previous section. The planning, design and implementation guidelines are broadly described below:

31. **Planning Criteria:** Minimize direct occupation of forest land and the acquisition of irrigated agricultural land, minimize destruction to irrigation canals and water supply lines, do not disturb fragile slopes, offset roads from settlements to avoid a dust hazard, and give preference to the dry face of mountain slopes and ridge routes.

32. **Design Criteria:** Balance cut and fill, place drainage disposal structures at safe points, manage excess spoil properly (*e.g.* through the use of identified tipping sites), minimize the displacement of houses, and integrate bio-engineering and other simple measures for slope protection.

33. **Implementation Criteria:** Provide sufficient technical supervision and support, use Forest Users Groups (FUG) for the construction of road sections within forests or ensure representation of the FUG in the Village Works and Roads Construction Committee, re-instate or improve disturbed local infrastructure such as water supply lines and irrigation canals, re-use spoil material in construction, and control the safe disposal of excess amounts.

34. These planning, design and implementation guidelines will specifically be enforced through the standard IEE process of HMGN and in conformity with ADBs procedures for the same. The IEE process is explained below.

Sub-Projects Requiring an IEE

35. An Initial Environmental Examination (IEE) is necessary for the rural roads, farmer-managed irrigation schemes, community water supplies and major motorable bridges envisaged in the DRILP, and is sufficient unless they pass defined thresholds of potential environmental impacts, or are located in defined environmentally sensitive areas. New construction of these categories of sub-projects is environmentally riskier compared to their rehabilitation/upgrading, or to investments made in other types of sub-projects. The individual IEE will identify sub-project specific mitigation measures. The IEE Methodology to be applied during the implementation of the DRILP involves 4 steps: i) Screening and Preparation of Terms of Reference (ToR); ii) Desk Review and Preparation; iii) Field Visit and Public Consultation; and iv) Analysis, Report Writing and Public Disclosure. Each of these steps is described further below.

36. Step 1: Screening and Preparation of Terms of Reference (ToR): For this purpose a half-day meeting will be called at the district headquarters. Relevant stakeholders such as representatives from the area where a sub-project will be sited, NGOs working in that area, persons knowledgeable about the area, and staff from relevant HMGN district offices should be invited to participate in the meeting. A candidate list of potentially positive or negative environmental consequences of the proposed sub-project, and possible options for the sub-

project, should be prepared, based on the discussion in this meeting. This should be utilized to draft a ToR for the IEE of the sub-project, as required in the Environmental Protection Act and the Environmental Protection Rules.

37. Step 2: Desk Review and Preparation: The IEE team, which will typically comprise three members, will review readily available information in the light of the concerns raised in the meeting referred to above, as well as considering the formal requirements. This will result in a preliminary summary of the relevant environmental information, and a refined sub-project specific checklist.

38. Step 3: Field Visit and Public Consultation: The IEE team will carry out a walk-through field inspection of the sub-project site, and collect relevant data. In addition to the observations and measurements made by the IEE team members, information will be collected through a process of consultation. Immediately before the site visit, notices will be sent out to the offices of the VDCs and the municipality, health centers, User Groups, NGOs and other relevant stakeholders, soliciting opinions and suggestions. Information about the sub-project will also be disseminated through the publication of a public notice in a national daily newspaper. Consultation has a very important place throughout the IEE process. All relevant stakeholders, such as affected communities, CBOs, NGOs, local bodies, schools, hospitals and knowledgeable persons will be consulted. In the case of small-scale water supply, irrigation or micro-hydro subprojects, consultation with downstream users and concurrence on water sharing arrangements will be a prerequisite for selecting the subproject.

39. Step 4: Analysis, Report Writing and Public Disclosure: The IEE team will analyze and interpret the information and insights obtained through the steps already completed. This will result in the identification and assessment of the following:

- Sources of impacts: these are sub-project activities, or other activities directly induced by the sub-project.
- Receptors of impacts: these are the environmental components, setting or features, and living or non-living entities, situated in a defined zone of influence surrounding a sub-project.
- Impact pathways, nature and significance: the ways in which a sub-project activity will have an impact on a receptor or multiple receptors, and multiple activities will have impacts on a receptor, or how receptors might have impacts on project and its activities.

40. The team will then recommend appropriate and cost-effective measures to mitigate the adverse consequences, and at the same time to enhance the positive impacts. The team will prepare a report incorporating all the work and findings, and in line with the format given in the Environmental Protection Rules. ADB and HMGN have slightly different formats for the IEE report, although the coverage of both is more or less the same. DRILP will adapt the HMGN report format such that it covers the information sought by the ADB format as well. In this way, a single report will satisfy the needs of both.

41. The IEE along with the monitoring plan will be made available to the general public through appropriate means (i.e., form and language) of information dissemination. Local NGO and CBOs, schools, and DDC offices will be used to disseminate information.

42. An IEE of Ratnechaur-Bhakimli Village Road in Myagdi district was prepared following the above steps and format and is available as a separate supplementary appendix.

Sub-Projects Exempted from IEE

43. New construction, rehabilitation and upgrading of trails, trail bridges, school and community buildings and health posts is not likely to have significant adverse impacts on the environment. These sub-projects are, therefore, generally exempted from formal environmental examination under the HMGN Environmental Rules. However screening, monitoring and other necessary mechanisms will be put in place to ensure that:

a) Environmental sensitivities are is taken into consideration, for example to avoid or minimize occupation of good forests, fertile agricultural land, high instability risk spots, and public land. Clearance must be obtained from the Community Forest Users Committee and District Forest Office if a sub-project is located in a forest area.

b) Environmentally less damaging methods are used for construction, for example use of labor and hand tools instead of heavy machines, re-use of materials and use of alternative technologies to blasting for rock removal.

c) Good management practices such as controlled and safe disposal of any excess spoil are used.

d) Appropriate mitigation measures are applied for slope protection such as bioengineering in combination with water management and simple engineering measures.

Responsibilities for Implementing Mitigation Measures and Monitoring

44. Environmental monitoring has been seriously lacking in most of the earlier rural infrastructure projects due to lack of commitment of resources and interest. DRILP will include a strong and independent monitoring mechanism to ensure that LEP principles, formal project requirements, and sub-project specific environmental mitigation measures are actually implemented. Monitoring will take place at two different levels: i) overall project level; and ii) sub-project level. These measures would be in addition to the regular process checks and technical supervision provided by the consultants.

Project Level Monitoring

45. The Environmental Management Section (EMS) of MoLD will coordinate the overall project level monitoring, as this is the responsible agency for environmental monitoring of rural infrastructure projects. Considering the resources and capacity constraints of EMS and DoLIDAR, DRILP will finance the monitoring, including provision of the necessary logistic and other support. The monitoring team should be independent of the implementation team, and will be formed by involving external consultant(s), as well as staff from EMS and DoLIDAR as observers. This will make the monitoring relatively independent and also will not over-burden EMS and DoLIDAR, which have resource and staff constraints. The monitoring team will submit its report to MoLD as well as to the ADB. The overall project level environmental monitoring should be carried out in the first, third and fifth years of implementation, preferably during the active construction season. It should focus on the following aspects:

a) Compliance with the Environmental Screening and IEE requirements as per the HMGN environmental legislation and as recommended in this report. (Whether each sub-project screened for potential environmental impacts, and IEE commissioned and approved where necessary).

b) Use of environmental criteria for sub-project eligibility, planning, design and implementation as recommended in this report. Are they effectively applied?

c) Existence and effectiveness of district level mechanism for environmental monitoring. (are there mechanisms for feedback, sharing and reporting? Are these effective?)

d) Use of labour-based environmentally sound construction methods. Are they strictly followed?

e) Addressing environmental needs in the capacity building, training and awareness raising activities of DRILP. How effectively is this being done?

46. The monitoring team will visit all the DRILP district headquarters and inspect sites of sample sub-projects. It is estimated that such monitoring will take on average 10 days per district. Different teams may be formed for different clusters. After submission of the monitoring reports a workshop of the members of the monitoring teams will be organized to review, combine and consolidate the findings of all the teams.

Sub-project Level Monitoring

47. Each District level DRILP management team will make arrangements for sub-project level monitoring. It would constitute a monitoring team, which must be independent of the implementation team and should consist of relevant persons in the context of the sub-project being monitored, for example persons from the forest, agriculture, social and NGO sectors. The monitoring team will be constituted separately for each monitoring event. For sub-projects for which an IEE is not required, checks are necessary prior to construction to ensure that preparations for implementation of relevant environmental mitigation measures have been made, and at least one monitoring is needed during the construction period to check construction practices and implementation of mitigation measures. For sub-projects for which an IEE is required and prepared, the sub-project specific monitoring plan contained in the IEE Report will be followed; at least one monitoring in each construction season is necessary. Sub-project level monitoring will cover the following general aspects (the specific aspects will be defined by the IEEs):

a) Disposal of construction spoils: efforts made to balance cut and fill; spoils and construction-generated materials re-used; spoils not disposed of haphazardly, and any excess spoils placed properly in pre-identified safe tipping areas; efforts made to conserve and re-use topsoil.

b) Forest and vegetation: Trees and vegetation cleared only from the necessary places, concerned Community Forest Groups involved or consulted for works in those forests; no unnecessary loss or degradation of forests due to sub-project construction.

c) Landslides, erosion and instability: appropriate mitigation measures implemented to avoid or minimise and control, including water management measures and bio-engineering (vegetation plantation in combination with simple civil engineering structures); cases and extent of landslides; erosion and slope failures due to sub-project.

d) Agricultural land and private property: damage or degradation of agricultural land or private property (causes, nature and extent of damage and degradation).

e) Local infrastructure: Impacts on existing water supply lines including their source, irrigation canals, trails, roads, and other local infrastructure due to the sub-project.

f) Cultural, religious, archaeological and historical sites: enhancement, damage, or degradation; encroachment into their land.

g) Occupational safety and public health: accidents, availability of first aid box at site, sanitation, and awareness.

h) Organisation of awareness programme: LEP methods, environmental considerations.

i) Employment: employment provided to local workers, women and the disadvantaged.

48. The sub-project level monitoring team will submit its report to DRILP district management, which will forward a copy to the DoLIDAR Project Coordination Unit

STAFFING AND REPORTING REQUIREMENTS AND BUDGET

49. As noted above, environmental management capacities at all levels are weak. DRILP will provide adequate technical and financial support to ensure compliance with environmental assessment procedures, mitigation measures and monitoring procedures listed in the sections above. In particular, the following aspects will be supported under DRILP. In addition, the district implementation teams have funds provided in their budgets to train district technical staff in environmental examinations.

1. Technical assistance to undertake proper subproject selection (i.e., adherence with environmental criteria) and design (i.e., adopting the LEP approach), including preparation of practical environmental guidelines;
2. Technical assistance to prepare and deliver environmental awareness programs, both sub-project specific and general;
3. Technical assistance and financial support to prepare and deliver training programs addressing the environmental aspects of DRILP activities, including on-the-job training for staff of DDCs, DoLIDAR and MoLD.
4. Technical and financial support to conduct independent monitoring both at the project-level and sub-project-level.

Item	Unit	Quantities								Unit Cost (US$)	Budget (US$)
		04/05	05/06	06/07	07/08	08/09	09/10	10/11	Total		
Environmental Assessment Specialists	Person-months	6	6	6	6	6	3	3	36	3,000	$108,000
Environmental Monitoring and Evaluation	Districts		18		18		18		54	2,500	$135,000
Environmental-related training and awareness programs	Workshops	1	1	1	1	1			5	2,667	$13,335

ANNEX 1

CRITERIA FOR DECIDING LEVEL OF ENVIRONMENTAL ASSESSMENT OF PROJECTS

Sub-project requiring Initial Environmental Examination (IEE)		Sub-project requiring Environmental Impact Assessment (EIA)	
1.	District Road	1.	National Highway
2.	Village Road	2.	Feeder Road
3.	Agricultural Road, 1 to 5km long	3.	Agricultural Road longer than 5km
4.	Ropeway 1 to 5km long	4.	Ropeways longer than 5km
5.	Main motorable bridges	5.	Any sub-project located in the following environmentally sensitive areas: ➢ National parks, wildlife sanctuaries, and protected areas ➢ Ecologically fragile areas and wet lands ➢ Semi-arid, alpine or snowy areas ➢ Flood or other hazardous zone ➢ Residential, school, and hospital areas ➢ Major sources of drinking water supply for public ➢ Unique areas of historic, cultural and archeological significance
6.	Upgrading, rehabilitation or re-construction of National Highway and Feeder Road		
7.	Irrigation scheme of 10 to 200ha. on hill slopes, or 15 to 500ha. in valleys Rehabilitation of irrigation system that irrigates more than 100ha. on hill slopes, or more than 200ha. in valleys		
8.	Hydropower Project of 1 to 5 MW size		
9.	Water supply scheme that serves 2,000 to 20,000 population, or addition of new source for scheme serving population of 10,000 to 100,000 A scheme that diverts 50% or more of dry season flow from a surface source that has I cubic metre per second of safe yield		
10.	Sand and gravel extraction from river at daily rate of 10 to 50 cubic metre		
11.	Small-scale mining of non-metallic minerals		
12.	Small-scale extraction of construction materials	6.	Any project that requires clear cutting of more than 5ha. of National Forest
13.	Stone crushing industries	7.	Any project that displaces more than 100 persons
14.	Project that requires investment of NRs 10 million to 100 million	8.	Any project that requires investment of more than NRs 100 million
15.	Water resources scheme that displaces 25 to 100 persons Water supply scheme that displaces up to 100 persons		
16.	More than 1km long river training works		
17.	33 to 66 kV electricity transmission line		
18.	1 to 6 MVA rural electrification scheme		

Note: Construction of minor motorable bridges (span less than 20m), trails and trail bridges, community buildings and schools, and upgrading or rehabilitation of rural roads and community water supplies are not included in the prescribed lists of sub-projects requiring IEE or EIA. Hence, these categories of sub-project are exempted from the requirement for formal environmental appraisal as long as they are not located in sensitive area, investment is below NRs 100 million and they do not displace more than 100 people.

ANNEX 2

SUBPROJECT SIZE LIMITS

Subproject Type	Size Limit
Construction of new, and the rehabilitation of existing district roads	Up to 20 km in length for new Up to 30 km in length for rehabilitation
Construction of new, and the rehabilitation of existing Village Roads	Up to 15 km in length for new Up to 20 km in length for rehabilitation
Small cross-drainage structures and all necessary protection structures	Up to 6m span
Small bridges and all necessary protection structures	Up to 20m span
Rehabilitation and upgrading of existing main trails including necessary construction of trail bridges	Up to 50 km in length
Improvement of village trails and construction of pedestrian bridges on such trails	Up to 10 km in length Maximum span of 80 m
Construction of new and rehabilitation of existing, clean water supplies	Maximum size of 200 persons per scheme
Rehabilitation of small irrigation schemes	Maximum size of 25 ha
Micro-hydro power	Maximum size of 10kW
Construction of market buildings	Maximum size of 125 sq.m.
Community buildings	Maximum size of 100 sq. m.
Construction of new, or rehabilitation and improvement of existing, health sub-posts	Maximum size of 100 sq.m.
Primary school buildings	Maximum size of 32 sq.m. per classroom

ANNEX 3

RECOMMENDED FORMAT FOR INITIAL ENVIRONMENTAL EXAMINATION REPORT

The IEE Report format proposed below is adapted from the format given in the Environmental Protection Rules and ADB's Guidelines. The IEE report should contain the following sections:

Executive Summary

This should summarize the following in 3 to 4 pages:

- Sub-project objective and alternatives
- Main impacts on environment: physical, biological, human, and built environment, impacts on land use, and loss or degradation of local properties and assets
- Main mitigation measures
- Conclusions and recommendations

A simple interaction matrix should be used to summarize the appraisal.

The Executive Summary must be translated into the Nepali language if the report is prepared in English.

Introduction

This section will provide the sub-project background; importance of the sub-project; owner of the sub-project; purpose, scope, and objective of the IEE; and methodology used.

Sub-project Description

This section should introduce the sub-project in simple terms and concisely, without missing any relevant points but avoiding unnecessary details. The section should be organised to provide information, in 3 to 4 pages, on:

- Sub-project type and size including alternatives sites and other options (plus a map)
- Sub-project activities (construction period, operation period and anticipated induced activities)
- Resources consumed including possible sources (land, energy, fuel and construction materials)
- Construction technology, equipment and machines
- Generation and disposal of wastes
- Human resources (labourers, skilled and professional) and availability
- Institutions involved
- Maintenance approach
- Estimated budget (construction and operation)

Description of Environmental Baseline

This is the description of the environmental setting of the sub-project location and surrounding areas that are likely to be affected by the sub-project, and should contain information on relevant environmental features and factors. This should cover the following (in 5 to 6 pages):

- *Physical resources*: topography, soils and geology, climate and air, rainfall, rivers and surface/groundwater
- *Biological and ecological resources*: forest and wildlife, bio-diversity, fisheries
- *Human and economic development*: population and communities, settlements, livelihoods and employment, infrastructure facilities, land use, and resources (agriculture, water and others)
- *Quality of life values*: historical, cultural and archaeological sites, aesthetic values, public health

Environmental features such as sensitive areas, main settlements, forests and unstable zones should be shown in a map.

Sub-project Alternatives

This section summarize the alternatives, their main environmental implications and comparisons, and recommends the environmentally preferred option.

Impact Assessment and Mitigation Measures

This section identifies and assesses the environmental impacts of the chosen alternative. It contains the analysis of the anticipated impacts, assesses their significance and identifies appropriate mitigation measures. These may be presented and discussed by main sub-project activities, their impacts on environmental receptors, and appropriate mitigation measures. Alternatively, they may be presented and discussed under the following sub-headings:

- Physical and chemical impacts
- Biological and ecological impacts
- Socio-economic impacts
- Cultural impacts

The analysis should cover the impacts on land/slope stability and erosion, air and dust, water, noise, built facilities and infrastructure, forest, vegetation and wildlife (flora and fauna), agricultural land, livelihoods, human health, and social, cultural and religious aspects.

Institutional Analysis and Monitoring Programme

This section summarizes the strengths and weaknesses of the involved institutions, and recommends monitoring indicators, activities, methods, and responsibilities.

Other Relevant Information

This section may or may not be necessary.

Findings, Conclusions and Recommendations

This section summarizes the main findings of the IEE study, concludes whether the sub-project is environmentally feasible or requires a detailed Environmental Impact Assessment (EIA), and presents the main recommendations.

Annexes

Terms of Reference

Summary of Consultations and Meetings

Notices Published and Pasted

Recommendations of the Concerned VDCs and Other Stakeholders

Photographs

Checklists and/or Questionnaires

List of Persons Met with Dates

TABLES

FIGURES