

I. SUMMARY INITIAL ENVIRONMENTAL EXAMINATION

RURAL RECONSTRUCTION AND REHABILITATION SECTOR DEVELOPMENT PROGRAM

ADB TA 4919 NEP, RRRSDP
Supplementary Appendix F
FINAL DRAFT

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II. SUMMARY INITIAL ENVIRONMENTAL EXAMINATION

A. A. Introduction

1. The proposed Rural Reconstruction and Rehabilitation Sector Development Program (RRRSDP) has been developed to meet the development needs of the rural and inaccessible areas of Nepal so that it helps in reducing the rural poverty by providing the population with better access to income-earning opportunities and essential economic and social development services.

2. The subproject outcome will be sustainable increased access to economic and social services, and enhanced social and financial capital for people in the project area, including poor people. To achieve this, the RRRSDP will extend the network of improved rural transport infrastructure, invest in small, community-level social and economic infrastructure and establish the practice of effective operation and maintenance. At the same time it will:

- i) provide paid employment on construction works;
- ii) increase people's awareness and participation, and empower rural communities for development;
- iii) increase institutional capacity at the DDC and VDC levels; and
- iv) increase accountability and transparency.

3. This combination of outputs is expected to result in sustainable improved access that enhances the livelihoods of rural people, including the poor.

B. Description of the project

4. RRRSDP will invest in the country's rural infrastructure sector with particular emphasis on rural roads, as this subsector has the highest priority in the Government investment plan for the short-term (for the coming three years). Rural water supply, to a lesser extent will also be included together with a number of other subsectors such as small irrigation schemes, mini-micro-hydroelectric systems, improvement of existing airports etc. all of which will be based on demand-driven signals from the local population in the course of implementation. The sector approach permits quick disbursements of ADB's funds into the sector, based on the detailed analyses of a few selected/representative core subprojects. In the present case, a subproject would be a road length linking one or more villages to the district headquarters, road links connecting villages, or a water supply scheme serving one or more villages. The totality of the subprojects comprises the investment package for the sector. Implementing the sector projects on the ground would require performance of complementary services in order to ensure that intended benefits accrue to the target beneficiaries. These complementary activities such as efficient financial management, social analyses, environmental safeguards measures, etc. will also be an integral part of the RRRSDP.

B. C. Description of the Sample Core Subprojects

5. The RRRSDP sample core subprojects have two main components:

- i) Rural Transport Infrastructure Development: This component include extension of improved rural transport networks through investment in four core subprojects for rehabilitation of rural transport infrastructure that are targeted at poor areas and are cost-effective and efficient in improving access.
- ii) Rural Water Supply and Sanitation: One rural water supply and sanitation scheme will be implemented to improve the quality of life in the project area. It will strengthen 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 water supply and other infrastructure in order to achieve a sustainable impact on socio-economic conditions. This will also include strengthening environmental management capacity.

6. Detailed feasibility and technical studies including environmental studies have been carried out by RRRSDP. The draft report on IEEs of all the sample core subprojects confirmed that none of them will require further EIA.

7. The list of sample core subprojects, their profiles and locations are given below:

Development Region	Name of the Scheme	Type/Profile of Subprojects	District
Eastern	Bhojpur-Manebhanjyang Section of Bhojpur-Ghodetar Road	<ul style="list-style-type: none"> (i) Population served: 24,499 (Within 4 hr walking distance) (ii) Classification: rural road and third priority in DTMP (iii) Surface condition: earth surface (iv) Right of way: 20.0 m (10 m on either side of centre line of road) (v) Formation width : 4.5 m (vi) Carriage way width: 3.0 m (vii) Shoulder width :1.5 m (viii) Side drain: No (ix) Structures: stone dry wall and gabion 	Bhojpur
Far Western	Dundhejhari – Tikapur	<ul style="list-style-type: none"> (i) Classification: Rural Road and third priority in DTMP (ii) Surface condition: Partially gravel up to Ch. 3+900 and rest earthen standard (iii) Design speed: 40 kmph (according to DOLIDAR, Technical guideline) (iv) Maximum gradient: 0.98% (v) Length of the grade: 125 m (vi) Right of way: 20.0 m (10 m on either side of centre line of road) (vii) Formation width: 6.0 m (viii) Carriage way width: 3.0 m (ix) Shoulder width: 1.5 m (x) Side drain: No (xi) Granular sub-base: gravel (xii) Thickness: 200 mm (proposed) (xiii) Pipe culvert: 33 nos. (Proposed hume pipe-60 and 90 cm dia) (xiv) Pipe culvert: 2 nos. (Existing Hume pipe-30 and 90 cm dia.) (xv) R.C.C Slab culvert: 6 nos. proposed (2m, 4m, 5m and 6 m) (xvi) Bridges (RCC): Two bridges proposed: one over Kulariya river (ch.4+480 km) and other over Ladkaniya river (ch.7+995) (xvii) Earth work: <ul style="list-style-type: none"> a. Cutting: 0 m³ b. Filling: 46570.25 m³ 	Kailali

		(xviii) Gabion retaining structures: 91.5m ³ (xix) Pavement:: granular sub-base material: 8242.5 m ³ Gravel (as per specifications)	
Mid Western	Chandane Drinking Water Scheme	Project details: Chandane subproject consists of seventeen schemes. A scheme is an independent water supply system deriving from one or more sources and serving a defined group of beneficiaries within clearly delineated area. Therefore, this subproject comprises of 17 independent rural water supply systems. The total transmission pipe length for 17 systems is 18 km (slightly more than 1 km on average) and total distribution pipe length is 31 km (about 2 km on average). One existing system requires 4 km pipeline rehabilitation. Each scheme generally consists of an in-take, a collection chamber, a small balancing storage tank and stand posts. The largest scheme, Chandane, covers an existing population of 1387 in 288 households. The second largest scheme is the rehabilitation of Gotikanda scheme which covers 818 existing people in 166 households. The other fifteen schemes are smaller with each one covering about 4 to 26 households. These micro schemes are appropriate in the context of rural hill Nepal where houses are scattered and these micro schemes cannot be integrated with the large scheme from the cost effectiveness point of view. Additionally, the smaller a system is, the more sustainable it is, because of little requirement for upkeep and maintenance. Water quality: In rural water supply works, normally water sample is tested by field kit in the field itself. In this case, the existing population is using those sources in an unimproved form, so the chances of pollution are minimal. The RRRSDP intends to confirm the water quality in near future.	Surkhet
Western	Beni – Pakhapani	(i) Classification: Rural Road (ii) Surface condition: Earth surface in normal but gravel and stone on edge soling at some very	Myagdi

		<p>steep section</p> <ul style="list-style-type: none"> (iii) Length of road: 19 km (iv) Design speed: 20 kmph (v) Maximum gradient: 15% (vi) Right of way: 20.0 m (10 m on either side of center line of road) (vii) Formation width: 5 m (viii) Carriage way width: 3.0 m (ix) Shoulder width: 2 m (x) Side drain: Only at selected section (xi) Structures: Stone dry wall and gabion (xii) Project duration: 3 Years 	
Central	Kamidanda–Taldhunga section of Khopasi-Taldhunga road	<ul style="list-style-type: none"> (i) Population served (4 hrs accessibility): 286336 (ii) Classification: Rural Road Class A Rural Road and fourth priority in DTMP (iii) Design speed: 20 kmph (according to DOLIDAR, Technical Guideline) (iv) Maximum gradient: 12% max. (v) Right of way: 20.0 m (10 m on either side of center line of road) (vi) Formation width: 4.5 m for this road (vii) Carriage way width: 3.0 m (viii) Shoulder width: 1.0 m (ix) Pipe culvert: 58 nos. (Proposed Hume pipe 60 cm dia) (x) Pipe culvert: 15 nos. (Proposed Hume pipe 90 cm dia.) (xi) R.C.C Slab culvert: 1 no. proposed at Chyalti river(6 m) (xii) Bridges(R.C.C): Two bridges proposed; first over Ladku river(22 m long) at (ch.13+500 km) and second over Bagmati River(55 m long) at (ch.73+600) (xiii) Earth work: <ul style="list-style-type: none"> a .Cutting: 614617 m³ b. Filling: 46421 m³ (xiv) Gabion retaining structures: 8040 m³ (xv) Dry stone retaining structures: 23563 m³ (xvi) Pavement: earthen surface (xvii) Project construction period: 2 ½ years. 	Kavre

D. Summary of strategic environmental approach of the five sample core subprojects

8. RRRSDP will use the LEP approach for construction of rural infrastructure. As the name suggests, labor is to be used instead of equipment, the natural environment is

conserved as much as possible and local interests and opinions are incorporated into the design and implementation of the investments. The main features of the LEP approach are: careful selection of the alignment of a road or subproject site; balancing cut and fill as far as possible; rock blasting only in exceptional circumstances; use of low-cost and appropriate drainage and protection structures; and integration of bio-engineering and water management measures for slope protection.

9. The EMP implementation will be decentralised, with the District Development Committees (DDC) as the 'project owners', the lead implementing agencies. The mitigation measures will be identified, selected, appraised and approved through a decentralised and participatory process managed by the DDCs at the project level.

10. RRRSDP will employ BGs for the mitigation works, providing paid employment for poor local people from within influence area of each core subproject. Works that require more specialised skills will be carried out through local contractors, and by using some equipment.

C. E. Summary of environmental aspects of the five sample core subprojects

1. Beni- Pakhapani Road

- (i) Protected area: The alignment does not pass through any protected area.
- (ii) Natural Hazards and Risky areas: There are just two landsides in this road alignment. One is in Khalbale Dhad and another is at Phuldada. Slide is still active because of seepage of surface water in the landslide area. Extensive bio-engineering works will be required.
- (iii) Water resources: The road alignment passes through 4 small streams. The streams are being used for irrigation and drinking water purposes.
- (iv) Social, Cultural Economic, Historic and Archaeological sites: There are Kamal Jaisi temple, Buddhist temples (Bauda Chaityas), Maharani temple in the very beginning of the alignment and some other temples near the alignment. However, within the road formation there are no major cultural and heritage sites.
- (v) Forest and Wildlife: The road alignment passes through some community forests, which are slightly dense. Species dominant in the forest are Pinus Roxborgis (Salla), Bamboo, Ficus Cunia (Khaniyu) etc.
- (vi) Area of Unique Geographical, Geological, Scientific and Aesthetic Value: From Akle Pipal to Toripani, there is a beautiful view of Dhaulagiri Mountain range, which could be an attraction to tourists.
- (vii) Common Property: None.
- (viii) EPR (1997) requirements: The project requires IEE and it has been conducted. No significant impacts are reported.

2. Dudhejhari-Tikapur Road

- (i) Protected area: A portion of the alignment passes through Community forest but not through any protected areas..
- (ii) Natural Hazards and Risky areas: There are no natural hazards reported in the screening report. However, in the rainy season, flood hazards can be a threat in general during heavy rains.
- (iii) Water resources: There are two streams in the existing alignment. Some impoundments do exist but are active only in the rainy season. Water resources are safe from the proposed road.

- (iv) Social, Cultural Economic, Historic and Archaeological sites: No significant impacts are reported. Some Bar-Pipal (resting places) are located along the alignment. No Damage or threat to religious, cultural and archeological sites
- (v) Forest Wildlife: No national forest or significant wildlife habitat areas in the alignment. A small portion of community forest, (without settlement) lies in the alignment.
- (vi) Area of Unique Geographical, Geological, Scientific and Aesthetic Value: The road does not damage or degrade any community infrastructure, nor it occupies or disrupts any cultural, historical or archaeological sites.
- (vii) Common Property: Impact on major settlement area, displacement of houses and common properties are not reported.
- (viii) EPR (1997) Requirements: IEE has been completed and no serious environmental issues requiring further investigations are reported. 3. Bhojpur-Manebhanjyang Road
 - (i) Protected area: A portion of the alignment passes through Community forest but not through any protected areas..
 - (ii) Natural Hazards and Risky areas: The road passes through different hazardous geological sections including many landslides. Extensive bio-engineering works are recommended.
 - (iii) Water resources: Altogether, 39 small rivulets pass through the alignment. Extensive cross drainage works required. Any threats to drinking water sources are not reported.
 - (iv) Social, Cultural, Economic, Historic and Archaeological sites: Not significant.
 - (v) Forest Wildlife: The road passes through some forest areas. The number of trees that will have to be felled is around 600. So, tree plantation to compensate the loss of trees are recommended in the EMP.
 - (vi) Area of Unique Geographical, Geological, Scientific and Aesthetic Value: Not significant according to IEE report.
 - (vii) Common Property: The project requires approximately 20 hectares of land for road construction and around 60 hectares for ROW. These lands are owned by private sector and some are government owned and common properties.
 - (ix) EPR (1997) Requirements: IEE is required and it has been completed and IEE report has already been approved by MOLD and no serious environmental issues requiring further investigations are reported.

(viii)

4. Kamidanda-Taldhunga Road

- (i) Protected area: There are no protected areas located in the road alignment.
- (ii) Natural Hazards and Risky areas: There are several landslides, mudslides and weak sections in the alignment. The quarry site is available near the alignment. 21 small bridges (20 m. span each) and one (63 m. span) over Bagmati will be needed for river crossings.
- (iii) Water resources: The alignment crosses through several natural streams. The stream water is being used for irrigation and other agricultural activities. The stream water is also being used for drinking water in the settlement areas downstream.
- (iv) Social, Cultural, Economic, Historic and Archaeological sites: Khopasi is very close to the Panauti Municipality which is rich in cultural and social heritage. Other cultural and historical sites are away from the road alignment.
- (v) Forest Wildlife: The road passes through about 8 km. of forest area which is very dense and there is no settlement in the forest.
- (vi) Area of Unique Geographical, Geological, Scientific and Aesthetic Value: The whole alignment passes through rugged, yet, scenic landscapes. The potential for domestic tourism after the road construction is very high.
- (vii) Common Property: There are several areas in the alignment that passes through government land and common properties.

(viii) EPR (1997) Requirements: IEE required and it has been completed.

5. Chandane Drinking Water Supply

- (i) Protected area: Non observed.
- (ii) Natural Hazards and Risky areas: The pipeline passes through steep slopes and mostly through agricultural areas.
- (iii) Water sources: The existing two sources are spring sources and are being used for only drinking purposes.
- (iv) Social, Cultural Economic, Historic and Archaeological sites: No any significant impacts reported.
- (v) Forest and Wildlife: The project passes through mostly forest areas but no felling of trees are required. Wildlife habitat is not significant except for some common animals such as jackals and other birds.
- (vi) Area of Unique Geographical, Geological, Scientific and Aesthetic Value: Not significant.
- (vii) Common Property: The underground pipeline passes through private properties and the top soil will be refilled after the trench and pipeline work is completed.
- (viii) EPR (1997) Requirements: IEE is not required.

D. F. Description of the Environment

11. Tropical, sub-tropical, warm temperate, cool temperate, alpine and arctic climatic zones exist in the RRRSDP districts. The climate varies substantially at local level within those zones due to combination of factors including slope aspects, altitude, and effects of rain shadow and relief.

12. The monsoon season (four months from June to September) is the main rainy season, when over 80% of total precipitation occurs. In the RRRSDP districts, mean annual precipitation varies from less than 800mm to more than 2,000mm. Localised high and low rainfall areas exist as a result of orographic and rain shadow effects.

13. The ambient air quality is excellent in the RRRSDP districts as they are remote rural areas. Indoor air pollution is common due to use of firewood, traditional wood stoves, and absence of proper ventilation in the houses.

14. The subprojects will not lie in any of the legally protected areas and national parks. Besides, they will not pose any threat to the rare, endangered and threatened species of animal and plants. The environmental eligibility and planning criteria proposed for subprojects in the RRRSDP mean that no subprojects located in or near to these protected areas will be financed by the project. Community forestry programmes have been implemented in most of the RRRSDP districts and some parts of these forests will be affected by these projects.

15. Subsistence agriculture is the dominant livelihood practice in most of the RRRSDP districts. Paddy, rice, wheat, maize, millet and barley are the common crops grown. Agriculture provides seasonal or partial employment to a vast majority of the population.

16. In different parts of the subproject districts natural potential exists for cash crops and horticulture; particularly citrus, apple, fresh vegetables, seed production, tea, and cardamom, in addition to the cereal crops traditionally grown for subsistence. Promotion of these is however constrained by the absence of access and other infrastructure support services, and linkages to markets. Potential also exists for development of hydro-power and tourism, specially in the mid-hill and mountain districts, and in some districts, potential for civil aviation works such as upgrading of airports do exist.

17. Farmer-managed small-scale irrigation canals are important local infrastructure. These generally exist in the river valley bottoms and lower slope areas, where paddy rice cultivation is common. A large proportion of the rural population is served by community water supply schemes.

18. Within each district, mostly in the mountain zone, lack of road access to the interior areas is a problem. Hired portering and self-carrying are the main ways of transporting goods. Trails and trail bridges are therefore important rural transport infrastructure at present.

19. Formal and informal community and social institutions exist in all the RRRSDP districts. They are active in the welfare and benefit of the communities

E. G. Potential Environmental Impacts and Mitigation Measures

20. Environmental considerations are fundamental in the RRRSDP approach and will be introduced from a very early stage of subproject selection and planning. Emphasis is on internalisation of environmental considerations into each stage of the subproject cycle. For example: avoidance of environmental damage as far as possible through proper planning; minimisation of the damage risk through environmentally sensitive design and the use of sound technology (LEP approach); and control of potential damage through proper management practices during implementation.

21. The largest part of the RRRSDP investment will be in the provision of rural infrastructure and the supplementary investments in community-level infrastructure. The environmental impacts of these subprojects depend on their type, size, and location. The sensitive environment, particularly physical (slope instability) and ecological, of the RRRSDP districts means that there is a risk of damage from subprojects if they are selected without adequate level of environmental considerations.

22. In RRRSDP, it is therefore proposed that: a) environmental criteria are used for subproject eligibility, planning, design and implementation; and b) each subproject be individually screened for potential impacts on the environment. Any project requiring EIA, hence, will not qualify under RRRSDP.

23. Based on the environmental assessment of sample core subprojects, following impacts and mitigation measures have been considered important for RRRSDP.

Negative Environmental Impacts and Mitigation Measures

Physical Environment (Construction Phase)	
Impact	Mitigation Measures
<p>i. <u>Erosions and Landslides:</u> Physical characteristics and slope stability of the road corridor are likely to be affected adversely during the construction phase specially in the hill and mountain areas.. Two major activities that will cause negative impacts on slope stability include road cutting, and excavation. Slope failures in the form of landslides and rock falls are likely to occur due to slope cutting. However, as mentioned in the project description, the construction methods adopted are to control surface erosion and sedimentatio</p>	<p>The construction activities will be strictly carried out as per the LEP Approach. Blasting will not be allowed as far as possible. Cut and fill mass management methods will be applied although a properly balanced cut and fill may not be possible throughout the road length. Protective measures such as construction of gabion walls, catchments drains and plantations should be adopted in those areas where serious problem of landslides do exist. Also the the extent possible the road centre line will be fixed at some distance (approximately 100m) away from the settlement areas.</p>

<p>n as far as practical. Therefore, the impacts will be low, local, short term and both direct and indirect.</p>	
<p><u>Air-borne dust:</u> The construction activities will temporarily increase the level of dust particles in the surrounding areas. It can have an impact on the health of labors and the local people.</p>	<p>Use of locally available clothes and handkerchiefs, as masks or dustguards among the labors will be encouraged. Regular sprinkling of water during the day time is also effective if the water is available nearby.</p>
<p>ii. <u>Water quality:</u> Water in the streams and rivers are likely to get polluted wherever the proposed alignment crosses through them. The impact will be direct, low, local and short term during the construction phase only.</p>	<p>Rivulets and drains will be protected using check dams and bio-engineering works to dissipate energy and avoid erosion. As part of road construction, side and cross drain will also be constructed. The project will design the drainage systems by considering the flow, conveyance, disposal of surface water runoff from the road etc. All road drains will be joined with the natural drainage system in order to avoid possible gully formation at different locations, particularly on hill slopes.</p>
<p>iii. <u>Construction debris, quarries and burrow pits:</u> The mismanagement of unused construction materials and abandoning of quarries and burrow pits without proper</p>	<p>Where quarries are required they will be limited to the areas which are not geologically or ecologically sensitive. After completion of construction activities, the quarries will be filled or otherwise altered by forming gentle slopes and applying bioengineering mitigation measures wherever necessary. To manage the construction debris, excess debris will be re-used, say for construction of small breast walls, backfilling water logging areas etc.</p>

reclamation works can have a long term safety hazards and other local problems.	
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Biological Environment	
<p><u>Vegetation and Forest Resources:</u> Most of the forests along the road alignment will be government managed forests, privately owned and community forests. The impact on vegetation and forest resources is expected to be substantial in cumulative terms, if not on individual subproject basis.</p>	<p>Loss of vegetation will be minimized through judicious site clearance and adoption of appropriate protection measures. Temporary loss of vegetation at work site and material storage yards will be re-vegetated after the completion of road construction. The directives of the Ministry of Forests and Soil Conservation will be followed while estimating compensatory plantation estimates. During re-vegetation, local species identified during the survey will be used.</p>
Social, Economic and Cultural Environment	
<p><u>Damage to existing infrastructures:</u> The subprojects will partially damage the existing infrastructures such as water supply, irrigation canals, local common facilities etc.</p>	<p>The affected infrastructures will be rehabilitated and reconstructed to the original state. Careful planning will be done to avoid any damage to existing infrastructure as far as practical. Budgets should be allocated to avoid funding problems at the later stage when the subproject is completed.</p>
<p><u>Occupational safety:</u> Accidents, other occupational safety issues and public health concerns will be the most important component during the construction phase as there will be no insurance policy for the workers and the working conditions could be very hazardous.</p>	<p>Safety related local orientations to the work force and the field staff will be carried out regularly. It will not incur extra cost to the subproject but it can be very useful to prevent accidents. The subproject must make the workers aware of the risks of accidents and they will be given orientation on appropriate safety practices at different work conditions. A first aid box should always be available at worksite and it should always contain emergency medicines. Also, provide on-site latrines and its use should be encouraged.</p>
<p>iv. <u>Loss of Agricultural Land and Property:</u> A significant area of farmland will be lost in terms of cumulative impacts on cultivated land.</p>	<p>Appropriate compensation and rehabilitation programs will need to be carried out as per the policy of the GON and ADB.</p>

Operational Phase		
v.	Physical Environment	
vi.	<p><u>Air pollution:</u> During the operation phase of the roads dust pollution will be increased due to the traffic as the roads will not be paved. The settlements in the project areas will be affected due to air borne dust. However, because of the low volume of traffic, the impact will be low, long term, localized and direct.</p>	<p>Provide speed bumps/breakers on the road sections within the dense settlements, bus stops, schools etc. to reduce vehicle speed and dust generation in such sections.</p> <p>Plant trees to create a dust barrier between the road and the settlement areas.</p> <p>Fix the road center line at some distance (say 100 ms.) away from the settlement areas.</p>
vii.		
viii.	<p><u>Soil Erosion and Landslides:</u> There is likely to be several landslides along the road alignment. The proposed road construction method and approach is strategically designed to minimize the soil erosion</p>	<p>An innovative and sustainable approach to control soil erosion and landslides will be brought into practice. This could be developed through local maintenance groups for whom the incentive mechanisms will have to be developed through toll systems or through other contributory system so that the maintenance workers are paid for their services.</p>

<p>ix.</p> <p>and landslides. There will be several unstable and geologically fragile hill slopes along the road alignment.</p>	
<p>x.</p> <p><u>Road Accident:</u> Construction and operation of roads invite road accidents. When the road is opened, the traffic will increase chances of accidents.</p>	<p>To minimize the accidents, proper road safety measures will be adopted. It is recommended that the road safety guidelines and codes developed by the Road Safety Unit of Department of Road will be followed.</p>
<p>Biological Environment</p>	
<p>Poaching of Wildlife: Several restaurants and hotels will be established along the road side and it is likely that there will be a high demand for wildlife products in the areas where they are easily available.</p> <p>xi.</p>	<p>Local level control mechanism will be the best solution for such problems.</p>
<p>Socio-economic and Cultural Environment</p>	
<p><u>Unplanned growth:</u> Haphazard development and emergence of illegal structures along the roads will be a problem which needs to be addressed with innovative solutions. Encroachments into the right of way and illegal constructions in the road width are quite common in rural areas.</p>	<p>Subproject will help the communities of such areas to prepare settlement plans for their area. The DDC and VDC should encourage and support the communities to follow the plan. The subprojects, in collaboration with VDCs and local communities, should organize awareness program for perspective road neighbours and encourage them to select a suitable site away from the road for construction of new buildings and not to encroach the road right-of-way.</p>
<p><u>Maintenance:</u> Regular maintenance of the road and other environmental mitigation measures, such as plantations, bio-</p>	<p>An innovative and sustainable approach to maintenance of the infrastructures, thus created, will have to be brought in to</p>

<p>engineering etc. are not usually carried out during the operation phase. This can result in gradual degradation of the environmental protection measures adopted during the construction phase.</p>	<p>practice. This could be developed through local maintenance groups for whom the incentive mechanisms will have to be developed through toll systems or through other contributory system so that the maintenance workers are paid for their services.</p>
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24. Beneficial Impacts and Enhancement Measures: The overall goal of RRRSDP is to contribute in the national objective of poverty alleviation through employment generation among the poor and disadvantaged groups of people in construction activities. During the subproject period, following activities will be carried out to enhance the positive environmental impacts:

- (i) Awareness programs to make people realize the economic-cum-environmental opportunities that subproject can bring about, including social changes in the subproject area;
- (ii) Dissemination of techniques of bio-engineering, slope stabilization, erosion control etc. during the subproject period for internalizing the appropriate technologies at the local level;
- (iii) Development of local area plans for managing haphazard growth in the potentially fast growth areas, aimed at minimizing the adverse environmental impacts;
- (iv) Promotion of alternate energy sources such as micro-hydro, bio-gas etc. in the subproject area;
- (v) Development of local mechanisms at the community level to control illegal harvesting of resources such as stone and sand mining, illegal harvesting of timber and other biological and natural resources.
- (vi) Innovative and financially rewarding road maintenance mechanisms which will generate regular employment to the poor and disadvantaged at the local level.

F. 25. Environmental Selection Criteria for Subprojects: Considering the potential environmental impacts of the sample core subprojects (four roads and one water supply) the following environmental criteria will be adopted for the selection of other subprojects.

- (i) Subprojects shall be essentially selected as per the DDC recommendations which will be based upon DDC's annual action plans, DTMPs and other approved plans that are endorsed by the DDCs.
- (ii) Subprojects should not pass through buffer zone of any protected national park, wildlife sanctuary or sensitive wetland.
- (iii) Subprojects preferably should not pass through sample or buffer zone of any ecologically sensitive area as recognized by GON or areas of international ecological significance identified by international convention (e.g. a RAMSAR site).
- (iv) To the extent possible, subprojects should avoid inclusion of any stretch that passes through any area designated for its cultural heritage values by GON or other international agency such as UNESCO.
- (v) Subprojects requiring EIA by GON will not qualify for RRRSDP funding.

H. Strategic Approach to Environment

26. Environmental eligibility criteria: The proposed environmental eligibility criteria will effectively eliminate environmentally complicated or difficult subprojects from being selected for RRRSDP funding. The planning, design and implementation criteria minimise and control the adverse impacts and enhance the overall environmental quality of subprojects.

27. Screening: To reinforce the adoption of the environmentally sensitive approach to planning and construction, each subproject proposal must be individually screened for potential environmental impacts in accordance with GON procedures defined in the Environmental Protection Rules (1997, revised 1999). This, as well as satisfying formal GON and ADB requirements, will additionally ensure that subproject specific environmental concerns are taken into consideration.

28. An Initial Environmental Examination: IEE will be necessary for most of the rural roads, farmer-managed irrigation schemes, community water supplies, and major motorable bridges envisaged in the RRRSDP, and is sufficient unless they pass defined thresholds of potential environmental impacts or are located in defined environmentally sensitive areas, in which case a full EIA is required. The RRRSDP eligibility criteria are intended to eliminate any subprojects that would require a full EIA. Each IEE will identify subproject specific mitigation measures¹.

29. Appropriate and Environment Friendly Technology: The conventional cut-through method of construction used in road building results into a number of adverse environmental impacts. These typically include: increased landslides and soil erosion, degradation of agricultural land, loss or degradation of vegetation or forest or wildlife, and degradation of existing local infrastructure. Effective application of the LEP approach proposed for the RRRSDP will reduce any environmental risk to the minimum and acceptable level. However, the environmentally sound principles of LEP may not be followed fully in practice unless there is proper guidance and monitoring. Successful implementation of the LEP approach crucially depends on an adequate level of technical supervision by qualified technicians through their continuous presence at site. Lack of understanding of LEP among the beneficiaries, technicians and others is another constraint to the successful implementation of the LEP approach. The RRRSDP will give emphasis to rigorous use of the LEP approach, environmental criteria and subproject specific mitigation measures. Particular emphasis is given in the design of the RRRSDP to ensure the adequate level of technical supervision and monitoring, supported by training - lack of which has caused projects to suffer in the past.

30. Restitution of Damages: Examples of the construction of one infrastructure scheme, particularly a road, adversely affecting other local infrastructure can be commonly found in Nepal. It is therefore proposed that, prior to starting construction of each core subproject, an updated inventory of the existing local infrastructure that is likely to be affected must be prepared, and consultations held with the beneficiaries and local bodies to find ways to avoid or minimise and control the impacts. The affected infrastructure must be reinstated to subproject pre-construction condition or better.

31. Local Employment: RRRSDP will employ local people for construction. This is expected to have positive economic, social and environmental impacts. In order to enhance the positive impacts, the project will organise orientation and training on labour-based road construction skills.

32. Safety Measures: Although major accidents are not anticipated, as the construction will use labour-based methods, it will be necessary to train the workers in appropriate safety

¹ A full IEE of four sample core subprojects (roads) have been produced during the preparation of the RRRSDP. One Environmental Statement has also been prepared for Chandane Drinking Water Supply Scheme.

practices under different work conditions. A first aid box should always be available at each worksite. Concentrations of construction workers and their inappropriate sanitation practices could increase the incidences of water and sanitation diseases, particularly gastro-intestinal disorders. The RRRSDP will provide on-site latrines and educate the workers in proper sanitation practices.

33. Enhancement of Positive Impacts: The improved access resulting from RRRSDP investments can induce a variety of positive as well as negative impacts; including crop diversification, increasing income level, poverty reduction, and increased pressure on natural resources. The levels of significance of the induced impacts, both positive and negative, are not fully known at this stage. These will be monitored as part of the evaluation of the impacts of each subproject. The information generated will be reviewed to identify the causes and factors for positive and negative impacts, and the findings used to devise a strategy to mitigate any negative impacts. During the implementation period the RRRSDP will encourage the development of a system and practice at the district and centre for monitoring and review.

34. Awareness-Raising, Information Dissemination and Social Mobilisation Activities:

These activities under the supplementary component are not expected to result in adverse environmental consequences. Rather, positive environmental results may be anticipated because of the better understanding of the project by the beneficiaries and other stakeholders, and through the impact on the social environment in the communities. In order to maximise the environmental benefit from this component it will incorporate environmental awareness and training activities. These will be targeted at elected representatives, political parties, DDC and VDC staff, technicians and communities.

G. 35. Capacity Building: This component is not likely to have negative environmental implications; rather the increased capacity that results should be environmentally beneficial. Activities to build environmental capacity will be incorporated in order to maximise environmental benefit from this component. Supporting DDCs, DOLIDAR and MOLD to perform their environmental responsibilities under the RRRSDP will help to build their capacity. The involvement of district staff in carrying out environmental activities and the provision of practical, on-the-job training on the IEE procedure are some ways of helping to build human resources at district level. There are other programmes and projects that may also contribute in the capacity building of these agencies to discharge environmental responsibilities. Therefore, RRRSDP should take a collaborative and coordinated approach to strengthen the environmental capacity of the concerned stakeholders.

H. I. Institutional Requirements and Environmental Monitoring Program

36. The Environmental Protection Act 2053 (1996) and Environmental Protection Rules 2054 (1997), revised 2055 (1999) supported by provisions scattered in other acts provide the basic legal framework for environmental appraisal in Nepal.

37. The Ministry of Environment, Science and Technology (MoEST), established in 1995, is the main institution mandated to formulate and implement environmental policies, plans and programmes at the national level. DDCs, as owners or proponents of subprojects, are responsible for screening and ToR preparation, commissioning IEE studies, and carrying out mitigating works. DOLIDAR, as a central level technical department which aims to facilitate and support DDCs, is responsible for providing back-up support to DDCs in carrying out their tasks and advising the MOLD as necessary. The MOLD, as the concerned line ministry, is responsible for review and final approval of ToR and study reports of IEEs, and for managing environmental monitoring. MoEST comes into picture only if a subproject requires an EIA.

38. The MOLD has an Environmental Management Section (EMS), which is mandated with the overall environmental responsibility of the ministry. Although its mandate is quite

wide, the section is very small and has only two officer level staff plus two non-officer level staff at present. The EMS will have to be strengthened and the manpower will need to be trained, specially for efficient management and approval of IEEs.

39. The capacity of the DDCs to undertake IEEs of subprojects by themselves is extremely low. Furthermore, most of the DDCs do not have proven abilities to carry out IEEs as prescribed in the Environmental Protection Rules. Hence, they need to be trained and provided with full support, especially from DOLIDAR and PCU.

40. Several private consultancy firms have experience of conducting IEEs of various types of rural infrastructure. Most of these companies however are located in Kathmandu, not in the districts. Furthermore, only few of them have permanent staff trained in environmental assessment. They generally depend on short-term consultants for the environmental tasks.

41. Environmental monitoring needs to be thoughtfully incorporated in to this project. In RRRSDP there must be strong and independent monitoring mechanism at two different levels: i) overall project level; and ii) subproject level. These are necessary in addition to the process checks and technical supervision by the concerned agencies.

42. The Environmental Management Section (EMS) of MOLD, DOLIDAR and PCU should coordinate the overall project level monitoring. Considering the resource and capacity constraints of the EMS (MOLD) and DOLIDAR, RRRSDP will finance the monitoring (including use of local consultants) and provide necessary logistic and other support. The monitoring team should be independent of the implementation team, and should submit its report to MOLD, DOLIDAR as well as to PCU. The overall project level environmental monitoring will be carried out preferably during the active construction seasons.

43. The District level RRRSDP management team will make arrangements for subproject level monitoring. It is recommended that a team be constituted which is independent from the implementation team. Checks are necessary prior to and during construction. At least one monitoring in each construction season is necessary. Subproject level monitoring should generally cover the following: disposal of construction spoils; forest and vegetation; landslides, erosion and instability; agricultural land and private property; local infrastructure; cultural, religious, archaeological and historical sites; occupational safety and public health; organisation of awareness programmes; and employment. For all the subprojects where an IEE has been prepared, the monitoring plan set out in that IEE will be followed.

1. Capacity Building

44. Extensive capacity building for environmental assessment and management will be carried out throughout this project. Various trainings will have to be carried out for communities, VDC, DDC, contractors and other relevant project staffs. Each person will be given a general orientation course on environmental management and the principles to be followed under RRRSDP will be the main focus of the training program. Depending on the technical ability and the responsibility of the persons, they will be given detailed engineering training on bio-engineering, slope stabilization and road alignment or training on how to recognize environmental issues, prepare environmental management plans and monitor environmental impacts.

45. Environmental management capacities at all levels are weak. To address these constraints and in order to meet the environmental requirements of the project, and to contribute to capacity building, the RRRSDP will:

- (i) Finance the costs of conduct of IEEs (using local consultants) and of environmental monitoring, including logistics and support costs.

- (ii) Through the PCU there will be capacity-building and awareness-raising support provided that will also demonstrate how the private sector can be used to fill capacity gaps. The consultants will provide a substantive input, by qualified and experienced domestic personnel, to: (i) assist in developing practical environmental guidelines, methodologies and institutional mechanisms as part of the Project Procedures Manual; (ii) advise DOLIDAR and the DDCs on environmental screening of all proposed subprojects; (iii) provide training and advisory support to the DDCs for the preparation and conduct of IEEs; (iv) assist the EMS of MOLD in the review of IEE reports; (v) provide advice to DOLIDAR in checking the environmental compliance of subprojects and supplementary investments approved by the DDCs; (vi) support the organisation, conduct and reporting of environmental monitoring; and (vii) organise awareness-raising activities and training to strengthen environmental management capacities in the VDCs, DDCs and DOLIDAR including MOLD.

2. Central Support

46. At the central level, a project coordination unit (PCU) to support the project will be established to represent RRRSDP and to function as the day to day working and management arm of the RRRSDP. The PCU will play a vital coordination role both during project preparations and implementation and ensure smooth communications with the MOLD, DOLIDAR, DDCs and other project stakeholders. As the concerned and supportive wing of RRRSDP, the PCU will take the overall responsibility for safeguarding the environment, throughout the project identification, preparation and implementation stages, as well as its overall responsibility for management of the development program itself.

47. Within the PCU, one environmental specialist/engineer will be staffed full time throughout the project period to support MOLD and DDCs at the central and district levels respectively. The PCU takes the specific responsibility for technical support to DDCs in environmental preparation, supervision, monitoring and enforcement of mitigation measures including review of environmental performance during project implementation. In particular, PCU will have the following specific responsibilities in its environmental aspects of operation during the implementation stage:

- Provide inputs in subprojects identification and implementation with regard to environmental and social considerations.
- Confirm subproject environmental categorization, and corresponding environmental documentation requirements, in consultation with the concerned environmental authorities, and in accordance with the relevant ADB guidelines and GON regulatory requirements.
- Facilitate engagement of consulting firms as requested by DDCs in preparation for environmental impact assessment documents to comply with the relevant regulatory requirements and ADB safeguard policies.
- Review completed IEEs for subprojects. As the regulatory review and approval will be the responsibility of the MOLD, the review by this group will be essentially to ensure the documents meet the ADB requirements and guide and assist the documents revision and improvement until it completely meets the ADB requirements.
- Supervise the actual implementation of environmental mitigation measures prescribed in the IEE during the project construction stage, through site visits, inspection tours, receiving and responding public concerns and complaints and review reports from contractors and DDCs and DTOs.
- Facilitate engagement of independent environmental monitoring institutions to support DDCs to carry out the environmental monitoring programs outlined in the project EMP. The PCU will also be responsible for review the monitoring reports and responding to any recommendations made in the monitoring reports.

- Initiate corrective actions and additional mitigation measures to those proposed in the EMP as may be needed during the project construction phase, in responding site supervision, monitoring and/or public complaints.
- Communicate and coordinate among project stakeholders mainly MOLD, DOLIDAR, DDCs, other relevant government agencies, professional teams/consultants, contractors, construction supervision companies, project communities, the general public as well as ADB, on environmental matters and advise MOLD/DOLIDAR senior management for policies, actions, programs and requirements to ensure the impacts of the project be minimized and project activities in full compliance with regulatory standards, and ADB safeguard policies.
- Organize and coordinate project completion, environmental acceptance inspections and review in accordance with relevant domestic regulatory requirements.
- Conduct other tasks as may be requested by MOLD, DOLIDAR, and DDCs or as may be recommended by PCU or as may be needed by the project for environmental protection.

48. Capacity building and institutional strengthening for MOLD, DOLIDAR and DDCs in general and EMS of MOLD in particular are critically important for the success of environmental management. Many of the responsibilities and functions listed above go far and beyond the standard requirements for DDCs for their regular annual projects. This is because; the DDCs will have to be thoroughly familiar with the ADB environmental requirements. To strengthen EMS of MOLD and DDCs the following have been proposed:

- Staff the PCU with the most qualified technical staff preferably, environmental engineers. Besides the general environmental impact assessment and environmental management experience for construction projects, the environmental staff of the PCU shall also be experienced with ADB policies, procedures and requirements.
- Conduct training for the DDC and EMS staff, including but not necessarily limited to classroom training for ADB policies and procedures, study tours to other more experienced PCUs which have successfully managed ADB projects, and attending relevant conferences.
- Engage professional consultants (third party) to assist or conduct parts or all of the functions/tasks for DDCs. There can be two approaches for this measure: engage individual consultants nationwide to work within the DDCs directly or engage a consulting firm to support and assist the DDCs. As the project will engage domestic firms for construction, the environmental review functions can be included in the construction supervision contract and request the winning to include relevant skills and experience in their project consulting team.

49. In addition, it is proposed that for the first group of non-core subprojects when DDCs start to undertake environmental procedures, PCU environmental specialists will involve in their full capacity. The objective of this process is to identify shortcomings of DDCs so that specific measures can be taken to strengthen DDCs (focused training, engagement of additional consultants, etc.). This process may also help ADB to understand and be satisfied with the ability, experience and knowledge to function independently without minimum ADB direct supervision for preparation and clearance of the remaining non-core subprojects.

3. Monitoring and Evaluation

50. Monitoring is an important element of environmental management. To improve the implementation of mitigation measures, the following activities will be undertaken during environmental monitoring.

- (i) Determine indicators to be used.
- (ii) Collect important and relevant information.
- (iii) Apply quantifiable criteria with respect to prescribed indicators.

- (iv) Conduct objective analysis of the information collected.
- (v) Work out clear conclusions based on above points.
- (vi) Draw rational conclusions and recommend improved mitigation measure to implementing agencies.

51. Types of Monitoring: Monitoring activities for the project are to be divided in three types:

- (i) Pre-Construction and Baseline Monitoring;
- (ii) Construction Phase Monitoring; this is generally sub-divided in two related activities:
 - a. Compliance Monitoring
 - b. Impact Monitoring
- (iii) Operational Phase Monitoring.
 - a. Compliance Monitoring
 - b. Impact Monitoring

4. 52. *Pre-Construction Monitoring: In the pre-construction monitoring, it will be necessary to confirm that all procedures regarding land acquisition and compensation have been properly set out and followed, and that the construction mitigation plan is in place. Priorities in this regard will include:*

- (i) Verification that the IEE mitigation recommendations relevant to the Contractor's responsibility are incorporated in the tender specifications;
- (ii) Verification that all government permits and approvals are in place prior to construction;
- (iii) Verification that land, property and crop and livestock disturbance compensation valuations have been completed prior to construction;
- (iv) Verification that all the necessary sub-plans within the framework of the Environmental Assessment and Review Procedures have been identified and prepared.
- (v) Verification that all necessary activities regarding the job opportunities, giving priority to the PAFs, have been completed prior to construction and hiring.

53. Baseline Monitoring: The primary concern during this phase will be to collect field data needed to enhance the knowledge of baseline conditions in order to assist in designing and estimating the cost of mitigation measures. Detailed information on the type of materials to be used, material collection site and methodology, design for drainage management, slope/erosion control and disposal of excess construction materials will be collected. Priorities in regard to baseline monitoring include:

- (i) Mapping of Sensitive Areas: Maps of sensitive areas, including protected areas, community forests, settlements and unstable slopes, should be prepared and cross referenced with proposed IEE measures.
- (ii) Survey and Documentation of Existing Agriculture Practices: Further analysis of the crops and livestock practices in the areas to be directly affected by the project is needed. This will provide information on precise measures to minimize disturbance and loss of cultivated and grazing land, as well as measures to increase agriculture intensity to replace the yield lost from land take.
- (iii) Construction Phase Monitoring: Construction phase monitoring is more comprehensive and multi-faceted. Compliance monitoring will be done by the DDC or a committee formed by the DDC at the local level and by DOLIDAR at the central level to ensure that EMP recommendations are being complied.

54. Impact monitoring will focus on key indicators to assess whether the impacts have been accurately predicted, and whether the mitigation measures are sufficient and effective. The main parameters for measurement will likely include:

- (i) Water bodies at critical areas like crossing of major water bodies;
- (ii) Quality of potable water supply to work camps and affected villages;
- (iii) State of forests, including community forests;
- (iv) Re-vegetation and slope stabilization monitoring;
- (v) Public safety and security monitoring;
- (vi) Health and sanitation monitoring;
- (vii) Status of flora and fauna monitoring;
- (viii) Social impact monitoring;
- (ix) Monitoring disposal areas and hazardous waste dump areas for leaching or run-off; and
- (x) Employment monitoring.

5. 55. *Operation Phase Monitoring: The proponent or developer will have the primary responsibility for operation phase monitoring. Same as the construction phase monitoring, there will be compliance monitoring and impact monitoring. The compliance monitoring will focus on determining that the prescribed mitigation and enhancement measures are being carried out.*

56. The impact monitoring will again focus on key indicators to assess whether the impacts have been accurately predicted and whether the mitigation measures are sufficient and effective. The main parameters for measurement will likely include:

- (i) Adaptation of resettlement households to their new homes and communities;
- (ii) Quality of potable water supply to workers and affected villages;
- (iii) Reconnaissance forest and land use change monitoring;
- (iv) Community forest monitoring;
- (v) Effects of access and control measures on wild lands, wildlife habitats and wildlife populations;
- (vi) Illegal hunting, trapping and tree felling monitoring;
- (vii) Public safety and security monitoring;
- (viii) Health and sanitation monitoring.

J. Public Consultation and Disclosure

57. Public consultation and information dissemination, which ensures public understanding of project impacts and allows the affected population to express their voices, are important parts of environmental assessment process. Environmental screening and assessment cannot be effectively conducted, nor can project impacts adequately be assessed, without active public consultation and information dissemination. Public consultation and information dissemination, for them to be effective and meaningful, in turn requires adequate community mobilization to ensure all stakeholders are well informed and have their voices heard.

58. Different governmental agencies, community organizations, NGOs and consultants will be part of public consultation and information dissemination processes of RRRSDP. DDCs assume prime responsibilities to carry out public consultation and information dissemination. VDCs are responsible to mobilize community members and encourage their active participation in consultation and information dissemination processes. Where VDCs lack capacity, consultants or local NGOs may be hired to help VDCs mobilize community members and carry out consultation and information dissemination. Among other community groups, Road User Committee (RUGs) and Road Building Groups (RBGs) are strongly encouraged to participate in consultation and information dissemination processes, to ensure that they understand all protective measures to be taken for road building and maintenance.

59. Community meeting, which should be open to all, is the primary means of community consultation and information dissemination. Where participation of certain group of people in

community meetings is difficult, due for example to geographical distance or social segregation, other methods such as door-to-door visits, structured and unstructured interview, separate community meetings or other participatory techniques will be considered.

60. The consultation framework presented below offers types of activities that should be carried out in each project phase, as well as who should be responsible for each activity.

Public Consultation and Information Disclosure process for RRRSDP

SN	Responsible Party	Activity	Output	Evidence of Participation	Remarks
Pre-Construction					
1	Community mobilizer/ Consultant	- Attend community meetings and inform participants of the project	- Consultation report	- Minutes of community meeting	- Positive and negative views expressed by participants are recorded
2	VDC	- Mobilize local people, organize or re-organize RUGs and RBGs - Raise broad-based awareness towards the project.	- Community meetings - RUCs/RBGs formed as per the guidelines	- Minutes of community meeting - Minutes of RUCs/RUGs meetings	- Ensure broad participation of community members specially vulnerable groups
3	Local Communities/ RUGs and RBGs	- Identify major issues related to the project.	- Community made aware of the project	- Minutes of community meeting - Minutes of RUCs/RUGs meetings	- RUGs and RBGs must be organized or reorganized as per the guidelines
Feasibility Study					
4	Community mobilizer/ consultant	- Inform community members of positive and negative project impacts	- Report on assessment of the project by community	- Minutes of community meeting	- It should be reflected in the IEE report
5	VDC	- Define project impact areas and identify affected population	- Community meetings	- Do	- Ensure broad participation of community members
Design of Project					
7	Community mobilizer/ consultant	- Inform community members of project design and components - Consult community members to develop EMP, RPF, IPF and other policy frameworks	- EMP, and other mitigation plans	- Minutes of community meeting	- EMP and other impact mitigation plans must be developed
8	VDC	- Collect supplementary data to develop Environmental and socioeconomic profile	-Supplementary data to develop environmental and socioeconomic profile	- Do	
9	Local	- Understand project	- Community	- Minutes of	- RUGs/RBGs

SN	Responsible Party	Activity	Output	Evidence of Participation	Remarks
	Communities/ RUGs and RBGs	component and mitigation measures to be carried out	meetings	community meeting	must understand mitigation measures
<i>Project Approval</i>					
10	Community mobilizer/ consultant	- Inform communities and VDCs of implementation procedures	- Minutes of public hearing	- Minutes of public hearing	
11	VDC	- Understand project components, impacts and mitigation measures - Organize public hearing		- Do	
12	Local Communities / RUGs and RBGs	- RUCs/RBGs hold group meetings to ensure their members understand mitigation measures to be implemented	- Minutes of group meetings	- Minutes of public hearing - Minutes of group meetings	- RUGs/RBGs must understand mitigation measures
<i>Project Construction</i>					
13	Community mobilizer/ consultant	- ensure mitigation measures are implemented - Hear and resolve problems that cannot be solved locally - Keep track of project's indirect effects	- Monitoring report	- Minutes of community meeting	- Ensure all are aware of conflict resolution and grievance redress mechanisms
14	VDC	- Monitor implementation of subprojects and the affected population - Hear and resolve conflicts - Keep track of project indirect effects		- Do	- Make sure that project components are not overlooked.
15	Local Communities / RUGs and RBGs	- Participate in road building process - Understand and implement mitigation measures		- Do	- Capacity building of RBGs
<i>Post-Construction</i>					
16	Community mobilizer/ consultant	- Observe maintenance and compliance norms	-report on maintenance	- Minutes of meeting	- monitoring must be carried out as stipulated
17	VDC	- Monitor direct and indirect impacts of project on community livelihood.		- Do	- All direct and indirect impacts must be reported
18	Local Communities / RUGs and RBGs	- Prepare maintenance contract with RUGs - Continue to build capacity		- Do	- RUGs/RBGs must develop strong ownership to the roads built

I. K. Findings and Recommendations

61. The whole RRRSDP districts may be termed as physically fragile and unstable except in the Terai region. The impacts of the small rural infrastructure subprojects, which will be identified, appraised and selected by the DDCs, depend on their type, size, location and the approach used for planning and construction. RRRSDP proposes to use the LEP approach in the construction of these subprojects, which is environmentally sound. The proposed environmental criteria for eligibility, planning, design and implementation of subprojects further minimise the risks of significant adverse environmental impacts.

62. All of the RRRSDP subprojects will be environmentally screened, as per the prevailing environmental legislation of Nepal and ADB's environmental guidelines. Individual IEEs are required for those subprojects which have chances of potential adverse environmental impacts and these IEEs will contain subproject specific mitigation measures. The possibility of environmentally difficult or complicated subprojects that require a full EIA will be eliminated through the environmental criteria for subproject eligibility.

63. Therefore, it is recommended that the RRRSDP does not require further detailed environmental study or EIA. However, adequate levels of technical supervision, monitoring and awareness are crucial for the successful implementation of the environmentally-sound approach proposed in RRRSDP. Experiences suggest that although many excellent recommendations have been made in the design of other rural infrastructure projects, the implementation of those recommendations has been questionable at best. It is therefore necessary to ensure that implementation follows fully the recommendations made in this report. The need for supervision and independent monitoring is equally important.

64. It is recommended that approval of subproject IEEs by the MOLD (which has the authority to do so), with support from the Consultants, be considered sufficient by the ADB. This is appropriate to provide the necessary oversight of compliance with RRRSDP environmental requirements while at the same time avoiding the need for double approvals, and associated administrative procedures, for all subprojects. Nepali legal provisions in essence also satisfy ADB's requirements. RRRSDP, wherever appropriate and possible, should facilitate or support the EMS in the subproject IEE approval process. The main impacts of, and recommended mitigation measures for, the proposed RRRSDP components are summarised in the Table at the end of this SIEE.

65. RRRSDP will finance relatively small rural infrastructure subprojects which, individually, have only minor environmental impacts. An array of environmental safeguards will be applied during selection, planning and design, and construction of these subprojects. Besides, each subproject will be individually screened for potential adverse environmental impacts, and IEEs of individual subprojects will be prepared, as necessary in accordance with the environmental regulations of GON and also satisfying the ADB environmental guidelines. The project can be classified as Environmental Category B project according to ADB's classification.

L. Conclusions

66. No additional environmental study or a follow up EIA is necessary for the overall RRRSDP. It is recommended that this SIEE is considered adequate for fund processing. It should be emphasised that environmental monitoring, and technical supervision and support, are extremely important and essential to ensure implementation of the stated environmental approach and practices.

Summary Environmental Impacts and Mitigation Measures

Project Component/ Action	Environmental Impact (without mitigation)	Degree of Significance				Recommended Mitigation Measures
		D1	D2	D3	D4	
Capacity building at the local level (DDC,VDC,NGO, LOCAL USER GROUPS)	No negative impact. Increased capacity should be environmentally beneficial (positive impact)	+				Participate in or facilitate where appropriate the efforts for collaborative and coordinated approach to strengthen environmental capabilities of DDCs, VDCs, NGOs and local user groups Involve district level human resources, if available, in carrying out environmental appraisal and monitoring Provide practical, on the job IEE training at district level supplemented by standard formats and simple guidelines Participate in or facilitate where appropriate the efforts for collaboration and coordination in raising environmental awareness Integrate environmental components/aspects in the project's awareness raising, information dissemination and social mobilisation activities
Awareness raising, information dissemination, and social mobilisation	No adverse impact. Increased flow of information and better understanding of the project by stakeholders (positive impact)	+				
Investment in rural infrastructure	Subproject could have minor to major adverse impacts depending on type, size, and location					Use environmental criteria recommended in the project IEE for subproject eligibility, planning, design, and implementation Screen each subproject individually, in accordance with GON environmental legislation and ADB's environmental guidelines Ensure rigorous use of LEP approach by providing sufficient and effective technical supervision/support; and through independent monitoring Organise orientation training and awareness-raising on LEP for different target groups (technicians, workers, Construction Committees) Prepare updated inventory of local infrastructure likely to be adversely affected and consult beneficiaries Reinstate the affected infrastructure to pre-construction condition or better
Construction activities: clearing, excavation, filling, spoil disposal, masonry works etc.	Landslides, soil erosion and slope instabilities					
	Loss or degradation of agricultural land and private properties including houses					
Employment of local labourers through Building Groups and local contractors	Loss or degradation of vegetation					
	Degradation or disruption of existing local infrastructure					
Improved access to the remote areas	Employment to local people (positive impact)					Organise skill training and awareness programme for the workers
	Risks of accidents, occupational safety and public health problems					Provide first aid box at all work sites Construct on-site latrines at work sites Educate workers on work safety practices and proper sanitation practices
	III. INDUCED IMPACTS Variety of induced positive as well as negative impacts, exact nature unknown at this stage					Monitor the induced impacts of each subproject, and review them to devise appropriate mitigation strategy Encourage development of monitoring and review system at district and centre

D1: No significant impact
D2: Small impact
D3: Moderate impact
D4: Major impact

+ : Positive impact
- : Negative impact
x: Positive or negative impact depends on various factors

Note: Recommended mitigation measures will reduce the significance level of the negative impact to D1 (no significance), whereas positive impacts will be enhanced.

