

Type: RBG/Contractor

Project Name:

Date of Inspection:

Environmental Impact Issue	Mitigation/Enhancement Measures	Resp.	Monitoring Compliance		
			Y/N/P/NA	Comment ref.	
A. Planning / Design Phase					
1. Route Selection	a. Phase 1	i. Present a number of alignment alternatives (e.g. 3 No): select the most favourable.	EC		
		ii. Consult adequately with local people about existing situation of the proposed alignment.	EC, NGO, TA team		
		iii. Ensure environmental issues are addressed during the selection of route of alignment.	EC (TA team)		
		iv. Select alignment avoiding risk prone areas (landslides, flood plains), houses and other buildings, <i>khét</i> land, protected area, public and private utilities as far as practicable.	EC		
		v. Ensure that `Green Road Approach` has been followed properly.	EC		
		vi. Avoid need for felling fruit trees as far as practicable.	EC		
		vii. Select route avoiding damage to /loss of large/culturally important trees.	EC		
		viii. Disseminate timely information regarding programme.	NGO		
		ix. Publicize accurate information on provision of land compensation.	NGO		
	b. Phase 2	i. Ensure that `Green Road Approach` has been followed properly.	EC		
		ii. Confirm Phase1 route is optimal. Make minor necessary improvements if required.	EC		
		iii. Check for areas of instability not apparent during Phase1 and address.	EC		
		iv. Ensure that information on likely damage to public/private utilities; religious and cultural sites and landslides have been collected and designed for.	EC (TA team)		
		v. Ensure that environmental mitigation measures` costs are incorporated in work estimates.	EC		
c. Phase 3	i. Inspect alignment for unsafe areas e.g. sharp curves (conduct `Safety Audit`)-design remedial measures.	EC (TA team)			

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2. Design Options	a. Waterway crossing	i. Design adequate side drainage works, in area where <i>khet</i> land and spring water exist.	EC		
		ii. Incorporate design features to ensure that run-off is conveyed into natural drainage lines at controlled velocities especially on steep sections where side drainage is provided.	EC		
		iii. Design adequate causeways where <i>kholsas</i> and <i>kholsis</i> exist, compatible with required level of reliable access.	EC		
		iv. Surface improvement through stone soling and graveling in marshy lands.	EC		
		v. Provide 5% outer slope for maintaining natural drainage (except as above).	EC		
		vi. Consider how agricultural users will require irrigation water to cross the road - incorporate sufficient measures.	EC		
	b. Bio-engineering	i. Identify cut and fill slopes susceptible to different erosion types.	EC		
		ii. Identify landslides, gullies, and quarry sites, etc..	EC		
		iii. Carryout detailed survey of each site.	EC		
		iv. Design appropriate bioengineering measures to suit site requirements (i.e. brushlayering and direct grass seeding in most of fill slopes; jute/coir netting with grass planting on cut slopes).	EC		
3. Material Options	a. Fills	i. Provide suitable cut and fill slopes appropriate to soil type.	EC		
		ii. Ensure design separates topsoil or other suitable material from cuts and does not permit its use in road fill.	EC		
		iii. Consider whether local fill materials are too weak or slippery. Replace with better materials if required.	EC		
		iv. Consider practicality of requiring compaction, particularly at deeper fills.	EC		

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	b. Structures	i. Follow logical and justified policy in selecting structure types, which take account of available materials as well as design stability. Propose innovative solution where appropriate.	EC (TA team)		
	c. Pavements	i. Consider stone soling/gravel in weak areas and high gradient	EC		
		ii. Consider Otta seal/black top in bazaar area, school area, hospital area, where dust pollution is high.	EC	N/A	
		iii. Pave roads through village as soon as possible.	EC		
d. Land acquisition & compensation	i. Assess the cost required for compensation.	DoR (TA team)			
B. Construction Phase					
1. Soils	a. Borrow	i. Minimisation of borrow requirements by avoiding wasteful side tipping -ensure adequate haulage provision.	EC		
		ii. Avoid excavating borrow pits in protected areas, forest areas and agriculture land.	EC		
		iii. Potential borrow sites should be located in areas of low productivity.	EC		
		iv. Stock pile top soil and preserved to spread during reinstatement of the site.	EC		
		v. Post-working reinstatement to at least previous level of productivity.	EC		
		vi. Use suitable size of borrow pits to match required volume.	EC		
		vii. Spread with top soil preserved and carry out grass seeding with long mulch and tree planting as part of bioengineering.	EC		
		viii. Plant leguminous plant species in order to restore soil nitrogen.	EC		
	b. Stone quarries	i. Insist on prior submission and approval of Quarry and Management Plan.	EC		
		ii. Quarries must be away from sensitive structures and settlement areas.	EC		
		iii. Quarries should not be operated within RoW as far as practicable, unless road widening required.	EC		

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		iv. Potential quarry sites to be located as far as possible in areas of low landscape quality, and so that development has minimum visibility from outside.	EC		
		v. Blasting is not permitted.	EC		
		vi. Give priority to river quarry if locate nearby project site.	EC		
		vii. Restriction of access to public during quarry operation.	EC		
		viii. Use safety measures while working at quarry sites.	EC		
		ix. When completed make sure that final slope is safe and hazard free.	EC		
	c. Slope stability	i. Avoid undercutting of slope toes from the beginning. Ensure designed slope.	EC		
		ii. Provide designed structures immediately following site preparation.	EC		
		iii. Timely application of bioengineering measures as per design. Perform during correct season.	EC		
		iv. Make aware local people not to encroach roadside slopes.	NGO		
	d. Soil Erosion	i. Employ RBG for monsoon damage maintenance.	EC (TA team)		
		ii. Minimize major earthwork during the rainy season.	EC		
		iii. Timely installation of appropriate slope protection works and drainage structures.	EC		
		iv. Absolute prohibition on spoils deposition at unapproved sites and on side tipping of spoil without toe wall.	EC		
		v. Timely application of bioengineering measures as per design/perform during correct season.	EC		
	e. Contamination of land	i. Protect cultivated land (<i>khet & bari</i>) from mixing spoil/debris.	EC		

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		ii. Avoid water logging condition due to inadequate drainage.	EC		
		iii. Protect from pouring of oil, greases, fuel spills and other materials using machine/vehicle that contaminate the soil.	EC		
		iv. Protect cultivated land and receiving water bodies from contamination of toilets slurry. Ensure proper restoration of disused latrine.	NGO		
		v. Inform people on solid and waste management especially in market and settlement areas.	NGO		
	f. Productive soil loss	i. Where topsoil or other fertile soil is encountered in cut, stock separately and spread for re-use.	EC		
		ii. Plant leguminous plant species in order to restore soil nitrogen and to increase organic matter.	EC		
	g. Disposal	i. Dispose of excess cut only in authorised sites (not agricultural land).	EC		
		ii. Construction of toe wall to retain tipped material.	EC		
		iii. Avoid disposal of cut spoil on forest areas.	EC		
		iv. Avoid disposal of cut spoil on agricultural land.	EC		
		v. Avoid disposal of cut spoil on water sources, irrigation canals, settlement areas, and religious and culturally important sites.	EC		
		vi. Terracing on wasteland.	EC		
		vii. Vegetate terrace risers.	EC		
2. Water Resources	a. Natural flows	i. Construct cross drainage (causeway, slab culvert, pipe culvert, vented causeway, truncated culvert, etc.) in all kholsas, <i>Kholsis</i> , and springs.	EC		
		ii. Avoid blocking or diverting natural watercourses.	EC		

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	iii. Incorporate adequate energy dissipation in drainage structures.	EC		
	b. Irrigation waters	i. Discussions with beneficiary groups regarding likely disruption of irrigation supply.	EC (TA team, NGO)	
		ii. Provide appropriate crossing structures at appropriate locations.	EC	
		iii. Arrange irrigation systems temporarily.	EC	
		iv. Immediate (timely) reinstatement of damaged existing systems.	EC	
	c. Drinking supply	i. Discussions with beneficiary groups regarding likely disruption of supply.	EC (TA team, NGO)	
		ii. Arrange temporary water supply systems where likely damage occurs.	EC	
		iii. Immediate (timely) reinstatement of disrupted drinking water supply pipes.	EC	
		iv. Ensure camps, labours do not interfere with public, competition for limited resources.	EC, NGO	
	d. Water pollution	i. Avoid tipping cut spoil directly into gullies or watercourses or over the edge of the road.	EC	
		ii. Use/construct temporary toilets away from water source (downstream or not close than 20 m).	NGO	
3. Air Quality	a. Dust	i. Use mouth masks.	EC	
		ii. Spray water wherever feasible (in areas of settlements & public institutions).	EC	
	b. Smoke / odours	i. Light fires only at approved locations away from houses and downwind.	EC	
		ii. Avoid dumping site nearby working site.	EC	
		iii. Use toilets and control outside defecation.	NGO	

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4. Flora	a. Natural growth	i. Use fire for rock breaking only as <u>last option</u> .	EC		
		ii. Do not permit lighting of fires near dry or forest/woodland areas.	NGO		
		iii. Motivate local people for planting trees through awareness raising.	NGO		
		iv. Clear only required vegetation from alignment..	EC		
	b. Managed growth	i. Prevent spoil tipping onto productive areas.	EC		
		ii. Plant trees wherever space is available on roadside.	EC		
		iii. Clear only required vegetation from alignment.	EC		
	c. Farmed land	i. Prevent spoil tipping onto productive areas.	EC		
		ii. Provide necessary water crossings at <i>khet</i> land and 5% outer slope at <i>bari</i> land.	EC		
		iii. Ensure discipline to prevent crop theft.	NGO		
		iv. Protect monsoon runoff from entering farmland.	EC		
	5. Fauna	a. Wild animals	i. Control poaching by imposed ban.	NGO	
ii. Avoid poisoning by controlling disposal of dangerous items.			EC		
iii. Do not disturb during breeding period.			EC		

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	b. Farmed livestock	i. Avoid impediment to movement of livestock grazing routes through construction activities.	EC		
		ii. Safe disposal of spoils from grazing land.	EC		
		iii. Protect water supply for livestock consumption.	EC		
6. Aesthetics and Landscape	a. Scars	i. Avoid throwing spoils.	EC		
		ii. Protect from deforestation on alignment.	NGO,EC		
		iii. Cut and fill balance as far as practicable.	EC		
		iv. Re-vegetate scars sites.	EC		
	b. Waste & litter	i. Avoid waste and litter throwing haphazardly on ground.	NGO		
		ii. Collect waste and litter into pit.	NGO		
	c. Re-vegetation	i. Plant attractive species in open areas where practicable.	EC (NGO)		
	d. Rock quarries	i. Restore quarry operation sites as per quarry Management Plan.	EC		
7. Noise Environment	a. Work camps	i. Impose regulation regarding noise restriction at night, and days of rest.	EC (NGO)	N/A	
	b. Equipment	i. Minimum use of mechanical equipment as far as practicable.	EC (TA team)		
		ii. Restriction on working hours particularly near houses/schools/hospitals.	EC,TA team		
8. Human Health & Safety	a. Site accidents	i. Avoid use of alcohol/ no drinking on site.	NGO (EC)		
		ii. Training in proper use of tools and equipment.	EC		

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		iii. Provide First aid training.	NGO		
		iv. Provision of use safety gears.	EC (TA team)		
		v. Keep First aid at working sites.	NGO (EC)		
		vi. Ensure speedy compensation procedure.	TA team, (EC, NGO)		
	b. Members of public	i. Erect signboard at likely debris falling site.	EC		
		ii. Erect signboard if pedestrians pass through construction sites.	EC		
		iii. Erect barrier at unsafe location.	EC		
	c. HIV	i. Organise HIV awareness raising training to RBGs	NGO		
		ii. Provide advice on access to health services	NGO		
	9. Community Economic Activity	a. Maximise labour opportunities	i. Give priority to RBGs to involve in construction activities as far as practicable (especially where contractor has been allowed).	EC (NGO, TA team)	
ii. Provide on-job training to RBGs for enhancing skills such as gabion wall, dry stone wall construction if necessary.			EC		
b. Saving and credit		i. Carryout saving and credit activity among RBGs	NGO (TA team)		
		ii. Involve RBGs in social economic development (SED) activities for boosting income opportunities	NGO (TA team)		

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	c. Economic status	i. Increase income and change social status of RBGs.	NGO (TA team)		
10. Land Acquisition / resettlement	a. Loss of land / homes	i. Provide compensation for land and house in Feeder Road as per Nepal Government's rules and regulation.	DoR (TA team)		
		ii. For District road follow rules and regulations established by DDC for compensation of land/house.	DDC (TA team)		
	b. Damaged houses	i. Protect houses by constructing retaining wall, breast wall, and toe-wall, as per need.	EC (TA team)		
		ii. Compensate damaged houses as per system established by DDC.	DDC (TA team)		
11. Cultural Heritage	a. Damaged cultural sites	i. Immediate stop of work, preservation of site and notification of finds to project authority.	EC (TA team)		
		ii. Involve local community in reinstatement of cultural and religious sites (e.g. graveyard/buried ground sites, temple of god and goddess, <i>chautara</i> , etc.).	NGO (EC, TA team)		
C. Operation / Maintenance Phase					
1. Maintenance	a. Routine	i. Establish system of community and road users` representation on a Maintenance Committee.	TA team (DoR or DDC)		
		ii. Establish system of length-man drawing on RBG experience.			
		iii. Establish system for maintenance fund collection.			
		iv. Establish system for monsoon /wet weather closure.			
	b. Periodic/	i. Establish Maintenance Management System (MMS).	DoR or DDC		

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	Upgrading	ii. Identify technical resource for periodic maintenance planning.			
		iii. Timely provision of 5 to 10 years budget requirement.			
		iv. Timely identification of funding sources.			
	c. Wilful damage	i. Coordinate with other line agencies in order not to wilful damage.	DDC or DoR		
	ii. Make local people aware regarding ownership and sustainability of road.				
2. Traffic usage	a. Overloading	i. Establish criteria and enforcement procedure.	DDC or DoR		
		ii. Intensity of vehicle should be as per design capacity of road.			
		iii. Load in vehicle should not be more than permissible limit.			
	b. Vehicle types	i. Establish criteria and enforcement procedure.	DDC or DoR		
3. Safety	a. Right of Way	i. Right of way should keep free from construction of houses/tea shop and other obstacles.	DDC & DoR		
	b. Traffic accident	i. Provide traffic warning signboard at appropriate locations.	DDC or DoR		
		ii. Provide speed breaker at school, hospital, and market areas.			
		iii. Make aware about traffic rules to public.			
		iv. Pavement surface improvements at critical sections.			
4. Employment opportunities	a. Increased customer base	i. Local people (previous RBG groups/poor, <i>janajati</i> , <i>dalit</i> , class) should be encouraged to raise threshold of living standard (must not be over ambitious).	DDC or DoR		

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	ii. Market price for local consumption and visitors should be monitored and recorded for regular reporting.				
	b. Reduced manual porter work	DDC or DoR			
	i. Give priority to displaced porter on loading- unloading works. ii. Introduce production based Income Generating Activities (IGA) or high value crops.				
D. Monitoring & Reporting					
1. Planning Phase	a. IEE	i. Prepare terms of reference (ToR) for IEE.	EC		
		ii. Submit ToR to DoLIDAR/DoR for approval of the concerned ministries.	EC		
		iii. Approve ToR.	MoLD/MoPPW		
		iv. Undertake IEE as per approved ToR.	EC		
		v. Submit Draft IEE Report to DoLIDAR/ DoR for comments.	EC		
		vi. Incorporate comments on Final Report and submit to DoLIDAR/ DoR then MoLD/MoPPW for final approval.	EC		
		vii. Approved IEE from MoLD/MoPPW.	MoLD/MoPPW		
	b. EIA	i. Prepare scoping document and submit to MoPPW for submission to MoEST for approval.	EC		
		ii. Prepare ToR, and submit to MoPPW for submission to MoEST for approval.			
		ii. Publish Public Notice and conduct public consultation	EC		
		iii. Approve scoping document & ToR from MoEST (formerly MoPE).	MoPE		
	iv. Prepare EIA Report as per approved ToR.	EC			

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	v. Conduct Public hearing at the Project site to collect public comments during preparation of EIA report	EC		
	vi. Submission of Final EIA Report to MoPPW for approval process then to MoEST (formerly MoPE)	EC		
	vii. Approval of EIA Report by MoEST (formerly MoPE)	MoPE		
2. Construction Phase	a. IEE	i. Apply mitigation measures as per IEE recommendation and apply EMP.	EC (TA team)	
		ii. Regular field visits to monitor implementation of mitigation measures.	TA team	
		iii. EMP Monitoring Report no less frequently than once every 3 months	TA team	
	b. EIA	i. Implement mitigation measures as EIA recommendation and apply EMP.	EC (TA team)	
		ii. Make field visits to monitor construction sites to check whether mitigation measures have been applied or not.	TA team	
3. Operation / Maintenance	a. IEE	i. No formal monitoring provided for.	-	
	b. EIA	i. MoEST is responsible to conduct environmental audit after 2 years of project operation.	MoEST	

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