


<b>Overall Duration</b>		1 hour 30mins
<b>Total Number of Slides</b>		65
<b>Plan for Practical Exercises</b>	No.	0
	Duration	
	Timing within Presentation	
<b>Reference Material</b>		Example Environmental Monitoring Report Example EMP List of All Relevant Reference Materials



Slide Headings	Bullet Points	Key Messages	Time (mins)
1. Title Slide	<b><u>(4F) Environmental Management</u></b> <i>Presentation for LRN Training</i> Presenter's Name Date of Presentation	Presenter introduces themselves and the module – 'Environmental Management'	0.5
2. Module Contents	<ul style="list-style-type: none"> <li>• Objectives of the module</li> <li>• Overview of Environmental Management Plans (EMPs)</li> <li>• Basic safeguards and precautions</li> <li>• Major issues/impacts of road works</li> <li>• Lessons learned on mitigation, bio-engineering from RAP 1, 2, and 3</li> <li>• Environmental benefit augmentation and mitigation measures practiced at RAP 1 and 2</li> <li>• Environmental monitoring and audit</li> </ul>	Introduce the module contents as per the list on the slide	1
3. Module Objectives	<ul style="list-style-type: none"> <li>• Understand why update of EMP is needed</li> <li>• Understand basic safeguards and precautions during implementation</li> <li>• Share lessons learned from RAP 1 and 2 on good and bad practices</li> <li>• Share lessons learned from RAP 1 and 2 in selecting mitigation measures</li> <li>• Recognise importance of monitoring and auditing</li> </ul>	Introduce the module objectives as per the list on the slide	1

Slide Headings	Bullet Points	Key Messages	Time (mins)								
4. Overview of Environmental Management Plans	Start of new section (sub-title slide)	Introduce new section on overview of Environmental Management Plans (EMPs)	0.5								
5. Environmental Management Plan (EMP)	<ul style="list-style-type: none"> <li>• EMP is the plan for environmental management during implementation of works</li> <li>• EMP is a part of the Contract Documents</li> <li>• <u>Supervision Consultant/Contractor and LRUC</u> will be responsible for implementation of EMP</li> <li>• As per EPR no obligation of EMP in IEE report</li> <li>• MoFALD provided format in the EMP in IEE report</li> </ul>	<ul style="list-style-type: none"> <li>• Introduce EMP and role during implementation as per list on slide</li> </ul>	1.5								
6. EMP Format	<p>Table</p> <table border="1"> <thead> <tr> <th>Impacts</th> <th>Mitigation and Methods</th> <th>Schedule</th> <th>Responsible Organisation</th> </tr> </thead> <tbody> <tr> <td>Degradation of forest</td> <td>Compensatory plantation (@ 1.25 as per DoF policy)</td> <td>By the end of project completion</td> <td>RAP3/DDC/DFD</td> </tr> </tbody> </table>	Impacts	Mitigation and Methods	Schedule	Responsible Organisation	Degradation of forest	Compensatory plantation (@ 1.25 as per DoF policy)	By the end of project completion	RAP3/DDC/DFD	<ul style="list-style-type: none"> <li>• Table provided is the EMP format given in the MoFALD Resource Book</li> <li>• Table has four columns; Impacts, Mitigation and Methods, Schedule, and Responsible Organisation</li> <li>• Run through example given on slide</li> </ul>	2
Impacts	Mitigation and Methods	Schedule	Responsible Organisation								
Degradation of forest	Compensatory plantation (@ 1.25 as per DoF policy)	By the end of project completion	RAP3/DDC/DFD								
7. Mitigation Cost Format	<p>Table</p> <table border="1"> <thead> <tr> <th>Activity</th> <th>Cost (NR)</th> <th>Organisation</th> </tr> </thead> <tbody> <tr> <td>Cutting trees and removal of vegetation, and compensatory plantation</td> <td>700,000 (depends on area of plantation)</td> <td>RAP3/DDC</td> </tr> </tbody> </table>	Activity	Cost (NR)	Organisation	Cutting trees and removal of vegetation, and compensatory plantation	700,000 (depends on area of plantation)	RAP3/DDC	<ul style="list-style-type: none"> <li>• Table provided is the mitigation cost format given in the MoFALD Resource Book</li> <li>• Table has three columns; Activity, Cost, Organisation</li> <li>• Run through example given on slide</li> </ul>	1		
Activity	Cost (NR)	Organisation									
Cutting trees and removal of vegetation, and compensatory plantation	700,000 (depends on area of plantation)	RAP3/DDC									
8. Relevancy of EMP Update	<ul style="list-style-type: none"> <li>• EMP included in IEE report is prepared during Pre-Feasibility stage</li> <li>• Detailed site specific impacts/issues cannot be identified during Pre-Feasibility stage</li> <li>• Alignment is normally altered during detailed design</li> </ul>	<ul style="list-style-type: none"> <li>• IEE EMP must be updated during detailed design</li> <li>• Initially prepared during pre-feasibility stage when site specific impacts issues cannot be identified</li> <li>• EMP must also be updated as per updates to alignment during detailed design</li> </ul>	2								



Slide Headings	Bullet Points	Key Messages	Time (mins)																				
	<ul style="list-style-type: none"> <li>• Experience and lessons learned also indicate changes in reality on site from information in IEE report</li> </ul>	<ul style="list-style-type: none"> <li>• Often situation on site changes compared to findings in IEE report</li> </ul>																					
9. Relevancy of EMP Update Contd.	<ul style="list-style-type: none"> <li>• Issues/impacts included in EMP are generic</li> <li>• To make implementable, update of EMP included in IEE report is needed</li> <li>• Projects funded by the Asian Development Bank (ADB) also make such provisions</li> </ul>	<ul style="list-style-type: none"> <li>• As IEE EMP is prepared at pre-feasibility it has to be generic as specific situation is not known</li> <li>• If EMP is not updated during detailed design then it will not be relevant or useful for environmental management on site during implementation of works</li> <li>• Projects funded by ADB also insist that EMP is updated during detailed design</li> </ul>	1																				
10. How to Update EMP	<ul style="list-style-type: none"> <li>• Take a copy of original EMP included in IEE report</li> <li>• Walkthrough of the alignment carried out by Assistant Residence Engineer (ARE) and Sub Asset Management Engineer (SAME)/Inspector of Works (IoW)</li> <li>• Assess carefully 100 m of both sides (i.e. direct zone of impact) from the centre line of road alignment</li> <li>• Use Table 1 to compile collected information</li> </ul>	<ul style="list-style-type: none"> <li>• Process to update EMP is as per list on slide</li> <li>• Table 1 format described in greater detail on next slide</li> </ul>	2																				
11. EMP Update Format	<ul style="list-style-type: none"> <li>• Table1: Alignment field verification for EMP update format (example)</li> </ul> <table border="1" data-bbox="454 938 1198 1220"> <thead> <tr> <th colspan="2">Chainage (km)</th> <th colspan="2">Issues/ Impacts Observed</th> <th rowspan="2">Location</th> <th rowspan="2">Mitigation</th> <th rowspan="2">Field Measurement</th> <th rowspan="2">Haulage Distance</th> </tr> <tr> <th>From</th> <th>To</th> <th>Left</th> <th>Right</th> </tr> </thead> <tbody> <tr> <td>2+425</td> <td>2+475</td> <td></td> <td>Spill Management</td> <td>Nigale</td> <td>Check wall construction</td> <td>D/WL=15m, H=2m</td> <td>Stone haulage 100-150 m</td> </tr> </tbody> </table>	Chainage (km)		Issues/ Impacts Observed		Location	Mitigation	Field Measurement	Haulage Distance	From	To	Left	Right	2+425	2+475		Spill Management	Nigale	Check wall construction	D/WL=15m, H=2m	Stone haulage 100-150 m	<ul style="list-style-type: none"> <li>• Slide shows Table1: alignment field verification for EMP update format (example)</li> <li>• Table has 6 columns; chainage, issues/impacts observed, location, mitigation, field measurement, haulage distance</li> <li>• Run through example provided on slide</li> </ul>	2
Chainage (km)		Issues/ Impacts Observed		Location	Mitigation					Field Measurement	Haulage Distance												
From	To	Left	Right																				
2+425	2+475		Spill Management	Nigale	Check wall construction	D/WL=15m, H=2m	Stone haulage 100-150 m																
12. How to Update EMP Contd.	<ul style="list-style-type: none"> <li>• Consult with local community for name of location, site situation, suitable enhancement and mitigation measures</li> <li>• Provide adequate time to complete field verification</li> <li>• After completing field work prepare and finalise table 2</li> <li>• Prepare a detail cost estimate (as outlined in table 3)</li> </ul>	<ul style="list-style-type: none"> <li>• Process for EMP updates format contd.</li> <li>• As per list on slide</li> <li>• EMP matrix format should be compiled in table 2, cost estimate should be documented in Table 3, covered in greater detail on next slides</li> </ul>	1																				





Slide Headings	Bullet Points	Key Messages	Time (mins)														
<p>13. Site Specific EMP Matrix Format</p>	<ul style="list-style-type: none"> <li>Table 2: Site Specific EMP Matrix format (example)</li> </ul> <table border="1" data-bbox="456 347 1196 608"> <thead> <tr> <th>Chainage</th> <th>Location</th> <th>Issue/Impact</th> <th>Mitigation</th> <th>BoQ Cost (NPR)</th> <th>Tentative Time</th> <th>Responsibility</th> </tr> </thead> <tbody> <tr> <td>2+425</td> <td>Nigale</td> <td>Spoil management</td> <td>Check wall</td> <td>100,000</td> <td>By Jan '15</td> <td>SC and support of DT</td> </tr> </tbody> </table>	Chainage	Location	Issue/Impact	Mitigation	BoQ Cost (NPR)	Tentative Time	Responsibility	2+425	Nigale	Spoil management	Check wall	100,000	By Jan '15	SC and support of DT	<ul style="list-style-type: none"> <li>Slide shows table 2: Site Specific EMP matrix format</li> <li>Table has 7 columns; chainage, location, issues/impacts, mitigation, BoQ Cost (NPR), Tentative time, responsibility</li> <li>Run through example provided on slide</li> </ul>	<p>2</p>
Chainage	Location	Issue/Impact	Mitigation	BoQ Cost (NPR)	Tentative Time	Responsibility											
2+425	Nigale	Spoil management	Check wall	100,000	By Jan '15	SC and support of DT											
<p>14. Cost Estimate for EMP Format</p>	<ul style="list-style-type: none"> <li>Table 3: Cost estimate for EMP implementation format (example)</li> </ul> <table border="1" data-bbox="456 687 1182 826"> <thead> <tr> <th>S.N.</th> <th>Item</th> <th>Quantity</th> <th>Rate (NPR)</th> <th>Amount (NPR)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Check Wall</td> <td>X</td> <td>Y</td> <td>XY</td> </tr> </tbody> </table>	S.N.	Item	Quantity	Rate (NPR)	Amount (NPR)	1	Check Wall	X	Y	XY	<ul style="list-style-type: none"> <li>Slide shows table 3: Cost estimate for EMP implementation</li> <li>Table has 5 columns; S.N., item, quantity, Rate (NPR), Amount (NPR)</li> <li>Run through example as on slide</li> </ul>	<p>1</p>				
S.N.	Item	Quantity	Rate (NPR)	Amount (NPR)													
1	Check Wall	X	Y	XY													
<p>15. How to Update EMP Contd.</p>	<ul style="list-style-type: none"> <li>Discuss with EO/DTL and RE and incorporate feedback, if any</li> <li>Finalise and forward EMP to ETL for approval of updates and cost, if required</li> <li>Upon approval orient all SC support staff and RBGs on the updated EMP and provide copies of the EMP</li> </ul>	<ul style="list-style-type: none"> <li>Process to update EMP continued, as per list on slide</li> <li>All RBGs and SC staff must be orientated on the update of the EMP, need to be fully clear on what mitigation measures need to be implemented, how, and who is responsible</li> </ul>	<p>2</p>														
<p>16. Construction Materials, Quarry Sites, Storage, Tipping Site Management</p>	<ul style="list-style-type: none"> <li>Important part of EMP</li> <li>Include: stone quarry, borrow sites, restoration and management plan, stones soil, and Gabion wire storage sites with approval of RAP EO</li> <li>Tipping site/spoil Management: Mention location with chainage, describe the site condition, amount to be tipped, lead distance with approval of RAP EO</li> </ul>	<ul style="list-style-type: none"> <li>Construction materials, quarry sites, storage, tipping site management are important parts of EMP</li> <li>List as per slide</li> </ul>	<p>2</p>														
<p>17. Worker/SBG Camps</p>	<ul style="list-style-type: none"> <li>Ideally establish worker/SBG camps in existing houses</li> <li>If not possible in existing house select suitable site and get approval from RAP EO</li> <li>Include: provision of Tripoline for shelter, other basic facilities</li> </ul>	<ul style="list-style-type: none"> <li>Worker / SBG Camps must be managed as per list on slide</li> </ul>	<p>2</p>														

Slide Headings	Bullet Points	Key Messages	Time (mins)
	such as Polythene pipe for drinking water supply, cooking fuel		
18. Worker/SBG Camps Contd.	<ul style="list-style-type: none"> <li>• Orient workers/SBGs on health and sanitation, waste &amp; garbage disposal, and pollution of stream sites and public places by workers</li> <li>• Ensure that workers/SBGs do not throw cigarette butts into forest areas (risk of forest fire)</li> <li>• First aid facilities must be available at all worker/SBG camps</li> <li>• Ensure workers/SBGs are aware of the risk of communicable diseases such as HIV, STDs</li> </ul>	<ul style="list-style-type: none"> <li>• Worker / SBG Camps contd., must be managed as per list on slide</li> </ul>	2
19. Worker/SBG Camps Contd.	<p>Photos</p>  <p>A worker's camp established as part of RAP2 along the Bhajpur-Ghodetar (BG2) road corridor, Bhajpur district</p>	<ul style="list-style-type: none"> <li>• Photo illustrates worker/SBG camp site conditions as part of RAP2</li> <li>• Camps should be managed in this way; neat and clean, environmentally friendly, provision of natural light, comfortable</li> </ul>	1
20. Basic Safeguards and Precautions	Start of new section (sub-title slide)	Introduce new section on basic safeguards and precautions	0.5
21. Permissions and Clearance Required	<ul style="list-style-type: none"> <li>• Approved IEE/EIA study of the respective subproject</li> <li>• Ensure approved IEE reports are submitted to all concerned stakeholders</li> <li>• Permissions from the concerned ministry (e.g. MoFSC) after recommendation from the concerned department (e.g. DNPWC) if subproject lies within protected areas</li> </ul>	<ul style="list-style-type: none"> <li>• Basic permission and clearance required before starting construction activities as per list on slide</li> <li>• Having understanding between District Forest Office (DFO), District level Buffer Zone office, Community Forestry User Groups (CFUGs) and RAP/DDC/DTO level institutions at local level makes it easier and reduces the time required to start the implementation of work instead of resolving issues from the Ministry and Departmental level at the centre</li> </ul>	2





Slide Headings	Bullet Points	Key Messages	Time (mins)
22. Permissions and Clearance Required Contd.	<ul style="list-style-type: none"> <li>• Coordinate with the Warden and concerned users committee of the area if the project is being implemented in a buffer zone area</li> <li>• Coordinate with respective DFO and Forest Users Groups (FUGs) before clearing trees and vegetation</li> <li>• Avoid damage of standing crops and inform landowners before starting construction</li> </ul>	<ul style="list-style-type: none"> <li>• Basic permission and clearance required before starting construction activities contd., as per list on slide</li> </ul>	1
23. RBG/RMG Health and Safety	<ul style="list-style-type: none"> <li>• Conduct training on correct use of tools and equipment</li> <li>• Conduct first-aid training with all RBGs/RMGs</li> <li>• Ensure use of safety gear</li> <li>• Maintain first-aid facilities at work sites</li> <li>• Ensure drinking water availability at work sites</li> <li>• Ensure speedy compensation procedure in case of accident</li> </ul>	<ul style="list-style-type: none"> <li>• RBG / RMG Health and Safety must include all steps listed on slide</li> </ul>	2
24. RBGs and PPE	<p>Photos</p>  <p>The top photo shows RBG workers in orange and blue safety gear working on a retaining wall as part of RAP2 along the Bhojpur, Shraddehar road corridor, Bhojpur district. The bottom photo shows RMG workers in various safety gear conducting maintenance works as part of RAP3 along the Urha-Bramand-Bulbul road corridor, Jharkhand district.</p>	<ul style="list-style-type: none"> <li>• Photo illustrates RBGs / RMGs using PPE during RAP works</li> </ul>	1
25. Accident Risk to Local Community	<ul style="list-style-type: none"> <li>• Erect signboard at sites with potential for falling debris</li> <li>• Erect barriers at unsafe locations</li> <li>• Erect signboards if pedestrians must pass through construction sites</li> </ul>	<ul style="list-style-type: none"> <li>• Mitigation measures used in RAP to prevent / minimise risk to local community as per list on slide</li> </ul>	2
26. Information Signboards	<p>Photo</p>  <p>The photo shows an information signboard installed along a RAP1 corridor in Achham. The signboard provides information on RAP3 and safety messages for the community.</p>	<ul style="list-style-type: none"> <li>• Photo illustrates a signboard installed along a RAP1 corridor in Achham</li> <li>• Signboard provides information on RAP3 and safety messages for community</li> </ul>	0.5










Slide Headings	Bullet Points	Key Messages	Time (mins)
	<p>A signboard installed as part of RAP1 along the Mangalsen-Lodeghat road corridor, Achham District. Project signboards such as this provide the community with information regarding the project and health and safety during the construction works.</p> 		
27. Major Issues/Impacts of Road Works	Start of new section (sub-title slide)	Introduce new section on major issues/impacts triggered by road construction activities	0.5
28. New Road Construction	<ul style="list-style-type: none"> <li>• Major issues/impacts observed during new road construction                             <ul style="list-style-type: none"> <li>○ Land use impact – damage to forests, cultivated and grazing land</li> <li>○ Felled trees management</li> <li>○ Spoil management</li> <li>○ Disruption to natural drainage patterns</li> <li>○ Impact on public and private utilities</li> <li>○ Dust pollution</li> <li>○ Impact on cultural and religious sites</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Major issues / impacts of new road construction are as per list on slide</li> </ul>	2
29. Land Use Impact 1	<p>Photo</p> <p>Protection of khet land carried out during RAP2 along the Chainpur-Barabise (CB2) road corridor, Sankhuwasabha District</p> 	<ul style="list-style-type: none"> <li>• Photo illustrates the protection of khet land through the constructed retaining walls during road construction along a RAP2 road corridor in Sankhuwasabha District</li> </ul>	1
30. Land Use Impact 2	Photo	<ul style="list-style-type: none"> <li>• Photo illustrates road alignment, in Mugu District, passing through forest vegetation, cultivated land, and grazing land hence spoil management is very important</li> </ul>	1

Slide Headings	Bullet Points	Key Messages	Time (mins)
	<p>Road alignment passing through forest and cultivated land along the Gamgadi-Dhaina-Dulachaur road corridor, Mugu District, as part of RAP3</p> 		
<p>31. Felled Trees Management 1</p>	<p>Photo</p> <p>Felled trees scattered due to lack of proper management during RAP3 works along the Gungadi-Dgaina-Dulachaur road corridor, Mugu District</p> 	<ul style="list-style-type: none"> <li>• Photo shows felled trees scattered due to lack of proper management along a RAP3 corridor in Mugu District</li> <li>• The proper disposal of felled trees should be managed immediately after felling</li> </ul>	<p>1</p>
<p>32. Felled Trees Management 2</p>	<p>Photo</p> <p>Trees felled where the RAP2 works did not require them to be cleared; Bhoipur-Ghodetar, Bhoipur District</p> 	<ul style="list-style-type: none"> <li>• Photo shows trees felled from unnecessary places during road construction along a RAP2 corridor in Bhoipur District</li> <li>• Several trees outside of the work area were felled unnecessarily</li> </ul>	<p>1</p>
<p>33. Spoil Management 1</p>	<p>Photo</p> <p>Damage to forest vegetation due to poorly managed spoil disposal during RAP2 works along the Champur-Barabise road corridor, Sankhuwasabha District</p> 	<ul style="list-style-type: none"> <li>• Photo shows damage to forest vegetation due to poor spoil management along a RAP2 road corridor in Sankhuwasabha District</li> </ul>	<p>1</p>

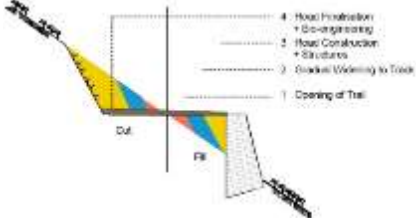


Slide Headings	Bullet Points	Key Messages	Time (mins)
34. Spoil Management 2	<p>Photo</p> <p>Minimum damage to forest and careful management of spoil during RAP2 works along the Diktel-Khotang road corridor, Khotang District</p> 	<ul style="list-style-type: none"> <li>• Photo shows minimum damage to forest vegetation due to proper spoil management along a RAP2 road corridor in Khotang District</li> </ul>	1
35. Spoil Management 3	<p>Photo</p> <p>Women RBG members transporting spoil as part of RAP2 works along the Rajpur-Chamara-Cautara (RC2) road corridor, Dohi District</p> 	<ul style="list-style-type: none"> <li>• Photo shows women RBG members carrying spoil for proper management without the use of wheelbarrows, using local solutions / methods</li> </ul>	1
36. Impact on Public and Private Utilities 1	<p>Photo</p> <p>Natural spring reinstated after completion of RAP2 road works along the Chainpur-Barabise road corridor, Sankhuwasabha District</p> 	<ul style="list-style-type: none"> <li>• Photo shows a natural spring that was reinstated as a part of environmental mitigation measures along a RAP2 road corridor in Sankhuwasabha District</li> </ul>	1
37. Impact on Public and Private Utilities 2	<p>Photo</p> <p>Protection of private house and construction of access way as part of RAP2 road works along the Chainpur-Barabise road corridor, Sankhuwasabha District</p> 	<ul style="list-style-type: none"> <li>• Photo shows works carried out along a RAP2 road corridor in Sankhuwasabha District to protect a private house and provide access way</li> <li>• Works were carried out as part of RAP2 environmental mitigation measures</li> <li>• Demonstrates RAPs understanding of the value of protecting private properties</li> </ul>	1




Slide Headings	Bullet Points	Key Messages	Time (mins)
38. Impact on Public and Private Utilities 3	<p>Photo</p> <p>Construction of pedestrian access route as part of RAP2 works along the Bhojpur-Ghodetar road corridor, Bhojpur District</p> 	<ul style="list-style-type: none"> <li>• Photo shows pedestrian access route / steps constructed as part of RAP2 works in Bhojpur District</li> </ul>	1
39. Impact on Public and Private Utilities 4	<p>Photo</p> <p>Water management at RAP2 constructed cascade drain along the Chainpur-Barabise, (CB2) road corridor, Sankhuwasabha district</p> 	<ul style="list-style-type: none"> <li>• Photo shows a cascade for water management constructed by RAP2 in order to protect public utilities along a road corridor in Sankhuwasabha District</li> </ul>	1
40. Impact on Public and Private Utilities 5	<p>Photo</p> <p>Irrigation canal reinstated following completion of RAP2 road works along Timisen-Ramaroshan road corridor, Achham District</p> 	<ul style="list-style-type: none"> <li>• Photo shows an irrigation canal reinstated as part of RAP2 environmental mitigation measures in Achham District</li> </ul>	1
41. Dust Pollution 1	<p>Photo</p>	<ul style="list-style-type: none"> <li>• Photo shows dust pollution triggered by earth</li> </ul>	1

Slide Headings	Bullet Points	Key Messages	Time (mins)
	<p>Dust pollution and excavated spoil deposited at river side during RAP2 works along Chupra-Mehaltoli road corridor, Dailekh district</p> 	<p>excavation and deposit of excavated spoil at a river side along a RAP2 road corridor in Dailekh District</p> <ul style="list-style-type: none"> <li>• Also indicate excavated spoil would have been managed properly</li> </ul>	
42. Dust Pollution 2	<p>Photo</p> <p>Dust pollution is created during RDG works as part of RAP3 along Gungadi-Chaina-Dulechaur road corridor, Mugu District</p> 	<ul style="list-style-type: none"> <li>• Photo shows women RBG members working in an area where there is heavy dust pollution without using masks (along a RAP3 road corridor in Mugu District)</li> <li>• Photo highlights both the importance of proper spoil management and dust mitigation measures as well as the use of PPE by RBGs (dust masks in this case)</li> </ul>	1
43. Impact on Cultural and Religious Sites 1	<p>Photo</p> <p>A memorial site for dead community members (Chautara) which was reinstated following the completion of RAP 2 works along the Chainpur-Harabise (CB2) road corridor, Sankhuwasabha district</p> 	<ul style="list-style-type: none"> <li>• Photo shows a memorial site (<i>Chautara</i>) reinstated as a part of RAP2 environmental mitigation measures in Sankhuwasabha District</li> <li>• It is very important to protect sites which are of religious and cultural importance to local communities during implementation of works</li> </ul>	1
44. Impact on Cultural and Religious Sites 2	<p>Photo</p> <p>Protection of religious tree as part of RAP1 works along the Chainpur-Nundhanki road corridor, Sankhuwasabha District</p> 	<ul style="list-style-type: none"> <li>• Photo shows the protection of a religious tree through the construction of a breast wall as part of RAP1 environmental mitigation measures in Sankhuwasabha District</li> </ul>	1
45. Road Improvements	<ul style="list-style-type: none"> <li>• Road improvement creates fewer issues/impacts than new road construction</li> <li>• Major issues/impacts created by road improvements include: <ul style="list-style-type: none"> <li>○ Spoil/waste management</li> <li>○ Impact on natural drainage patterns</li> <li>○ Impact on public and private infrastructure</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Major issues / impacts of road improvements are less than road construction</li> <li>• Issues / impacts are as per list on slide</li> </ul>	2




Slide Headings	Bullet Points	Key Messages	Time (mins)
	<ul style="list-style-type: none"> <li>○ Dust pollution</li> <li>○ Impact on cultural and religious sites</li> <li>○ Impact of quarry sites</li> </ul>		
46. Road Maintenance	<ul style="list-style-type: none"> <li>● Routine/recurrent road maintenance creates the least issues/impacts compared to new road construction and road improvements, 'specific maintenance' is very similar to new construction</li> <li>● Major issues/impacts include:                             <ul style="list-style-type: none"> <li>○ Damage to irrigation canals and river bank crossings</li> <li>○ Relocation of electricity poles</li> <li>○ Landslide stabilisation</li> <li>○ Damage to private property due to road widening – social issues</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Routine / recurrent maintenance creates least issues / impacts</li> <li>● Issues / impacts are as per list on slide</li> </ul>	2
47. Environmental Benefit, Augmentation, and Mitigation Measures Practiced During RAP 1 and 2	Start of new section (sub-title slide)	Introduce new section on environmental enhancement and mitigation measures practiced in RAP1 & 2	1
48. Planning/Design Phase	<ul style="list-style-type: none"> <li>● RAP principles include:                             <ul style="list-style-type: none"> <li>○ Discussion and consultation with local communities</li> <li>○ Selection of alternative alignments</li> <li>○ Careful finalising of alignment</li> <li>○ Phase wise construction (Phase1, 2, 3)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● RAP principles for an environmental friendly approach during planning and design phase are as per list on slide</li> <li>● Discussion and consultation with local communities is essential for success of programme</li> <li>● Alignment selection and finalisation needs to take into account community's needs, areas of importance / sensitivity, etc.</li> <li>● Phase wise construction described further on next slide</li> </ul>	1
49. Construction Phase	Diagram	<ul style="list-style-type: none"> <li>● Diagram illustrates phase wise construction approach</li> <li>● Used to ensure that construction is environmentally sound and sustainable</li> <li>● Phases are:</li> </ul>	1

Slide Headings	Bullet Points	Key Messages	Time (mins)
		<ol style="list-style-type: none"> <li>1. Opening of trail</li> <li>2. Gradual widening to track</li> <li>3. Road construction and structures</li> <li>4. Road finalisation and bio-engineering</li> </ol>	
<p>50. Construction Phase Contd.</p>	<p><u>Socio-economic enhancement (RAP 1 and 2)</u></p> <ul style="list-style-type: none"> <li>• Involved local communities in construction activities</li> <li>• Exclusively worked with local poor and directly project affected households for RBGs</li> <li>• Provided skills development training on construction, bio-engineering, savings and credit, etc.</li> <li>• Economic infrastructure development supported as part of livelihood promotion</li> <li>• Facilitated access to income generating activities</li> <li>• Created social awareness around topics such as women's rights, elder citizen allowance</li> </ul>	<ul style="list-style-type: none"> <li>• Socio-economic enhancement activities in RAP1 and 2 were as per list on slide</li> <li>• Critical component of works to ensure road works have positive impact on wide range of socio-economic aspects</li> <li>• Ensures continued community support for road works / maintenance</li> </ul>	<p>2</p>
<p>51. Construction Phase Contd.</p>	<p><u>Mitigation measures (RAP 1 and 2)</u></p> <ul style="list-style-type: none"> <li>• Use of LEP – labour based environmental friendly participatory approach</li> <li>• No use of blasting materials</li> <li>• Ensured Personal Protective Equipment (PPEs) used by all RBG members</li> <li>• Maintained first aid facilities at construction sites</li> <li>• 5% outward slope of road surface</li> <li>• Causeways in each perennial and seasonal streams and rivulets provided</li> <li>• Adequate cross drainage structures provided to avoid natural flow of water especially for unusual rainfall</li> </ul>	<ul style="list-style-type: none"> <li>• RAP1 and 2 mitigation measures were as per list on slide</li> <li>• Use of LEP / no blasting materials protected fragile mountain environment, provided employment, and improved sustainability of roads</li> </ul>	<p>2</p>
<p>52. Labour Based Environmentally Friendly Participatory Approach</p>	<p>Photo</p>	<ul style="list-style-type: none"> <li>• The photo illustrates the use of the labour based, environmentally friendly, participatory approach</li> </ul>	<p>1</p>



Slide Headings	Bullet Points	Key Messages	Time (mins)
	<p>Breaking of stone by hand, without the use of blasting during RAP2 road construction along the Ramaghat-Singesar road corridor, Dailekh district</p> 	<p>(LEP – refer back to slide no. 51) for the breaking of rock in Dailekh</p> <ul style="list-style-type: none"> <li>• Rock is broken out manually without use of blasting materials</li> <li>• Leads to creation of further employment for locals</li> </ul>	
<p>53. Balance of Cut and Fill</p>	<p>Photo</p> <p>Spoil management during RAP2 works along the Kamalabazar-Jangalghat road corridor, Achham District</p> 	<ul style="list-style-type: none"> <li>• Photo illustrates spoil management following earth excavation for road construction</li> <li>• Provisions for managing spoil surplus, the building of check walls/toe walls, can be seen in the photo</li> </ul>	<p>1</p>
<p>54. Spoil Retaining Walls</p>	<p>Photo</p> <p>Mass balancing practiced as part of RAP2 through the construction of a retaining wall along the Kamanbazar-Jangalghat road corridor, Achham District</p> 	<ul style="list-style-type: none"> <li>• Photo shows mass balancing practiced during RAP2 work through construction of retaining walls</li> <li>• Mass balancing during RAP2 was managed by the use of two approaches:                         <ol style="list-style-type: none"> <li>i) Longitudinal mass balance: excess mass generated due to road widening was used on nearby longitudinal sites where surplus mass was needed for filling in road embankments and when the alignment passed through settlement areas the surplus mass was transported and disposed into gullies and depressed areas.</li> <li>ii) Cut and through balance: mass was managed by providing structures in valley side like retaining/ toe wall check wall and using surplus excavated mass for constructing terraces on slopes</li> </ol> </li> </ul>	<p>1</p>



Slide Headings	Bullet Points	Key Messages	Time (mins)
55. Protection of Slopes using Bio-Engineering 1	<p>Photo</p> <p>Slope protection as part of RAP1 including spoil retaining wall and bio-engineering; Rajpur Chhamera Chauraha road corridor, Doti district</p> 	<ul style="list-style-type: none"> <li>• Photo shows a spoil retaining wall combined with bio-engineering for slope protection in Doti</li> </ul>	1
56. Protection of Slopes using Bio-Engineering 2	<p>Photo</p> <p>Slope protection through brush layering as part of RAP2 works along the Masuti-Sankrathazar road corridor, Jharkhand District</p> 	<ul style="list-style-type: none"> <li>• The photo shows brush layering being put in place to protect slopes as part of RAP2</li> <li>• Brush layering was found to be one of the most successful slope stabilisation systems used during RAP2</li> </ul>	1
57. Land Reclamation	<p>Photo</p> <p>Reclamation of damaged khet land as part of RAP1 works along the Bhoipur-Chyandanda road corridor, Bhoipur District</p> 	<ul style="list-style-type: none"> <li>• Photo illustrates reclamation of damaged cultivated <i>khet</i> land as a part of environmental mitigation measures under RAP1</li> <li>• The major steps involved in reclamation of khet land include removal of large boulders and spoils accumulated over cultivated land, use of the spoils (stones, boulders) for building terraces (if no terraces exist), and maintaining land as it was before to make it suitable for cultivation</li> <li>• When carrying out road works you must ensure that valuable livelihood sources, such as khet land, are protected to the greatest extent possible and repaired / reclaimed etc. if damage cannot be avoided</li> <li>• Very important to ensure community buy in / motivation for road works</li> </ul>	1
58. Operation Phase	<ul style="list-style-type: none"> <li>• Handover to DDC</li> <li>• DDC carry out operation &amp; maintenance</li> </ul>	<ul style="list-style-type: none"> <li>• RAP projects constructed under direct funding approach are formally handed over to the DDC at a handover ceremony in the district. During the handover project costs will be explained and a</li> </ul>	1

Slide Headings	Bullet Points	Key Messages	Time (mins)
		<p>handover letter will be provided to the DDC</p> <ul style="list-style-type: none"> <li>• Once the handover to the DDC takes place, the DDC are then responsible for operation &amp; maintenance</li> <li>• After handover of roads to DDC, the DDC prepares annually the Annual Road Asset Management Plan (ARAMP) in which roads are prioritised based on condition survey and the DDC allocates funds from its rural roads maintenance fund. In addition, the DDC also seeks maintenance funds through other sources such as Road Board Nepal (RBN), and other donor funded projects focusing on road maintenance work such as RAP3, Local Road Improvement Project (LRIP), and Strengthening National Rural Transport Program (SNRTP)</li> </ul>	
59. Environmental Monitoring and Audit	Start of new section (sub-title slide)	Introduce new section on environmental monitoring and audit	0.5
60. RAP1 Environmental Monitoring	<ul style="list-style-type: none"> <li>• Regular field visits conducted by Environmental Specialist along with engineering team</li> <li>• Discussion and walkthrough with DTA and SC team at early stage of construction</li> <li>• Provided feedback on site and by field visit notes</li> <li>• Prepared environmental monitoring report at latter stage of construction</li> <li>• Verified level of accuracy of IEE prediction, assessed environmental effects and resource losses</li> </ul>	<ul style="list-style-type: none"> <li>• Environmental monitoring during RAP1 was carried out by the RAP Environment Specialist</li> <li>• Environmental monitoring involved steps as per list on slide</li> </ul>	1
61. Environmental Audit Definition	<ul style="list-style-type: none"> <li>• A systematic and documented process of auditing an existing project or programme to determine whether specified environmental activities have been carried out to an appropriate standard</li> <li>• Environmental audit process often used to record environmental performance at regular intervals throughout implementation</li> </ul>	<ul style="list-style-type: none"> <li>• Definition of environmental audit on slide is as per DoR, GESU, 2008. ESMF</li> <li>• ESMF provides legal and policy framework for integration of environmental and social aspects into project plans, design and implementation including IEE/EIA approach, issues/impacts, mitigation measures</li> </ul>	1

Slide Headings	Bullet Points	Key Messages	Time (mins)															
		<ul style="list-style-type: none"> <li>• Environmental audit process as per slide</li> </ul>																
62. Purpose of Audit	<ul style="list-style-type: none"> <li>• The main purpose is to:                             <ul style="list-style-type: none"> <li>○ Study the condition of environment before and after project implementation</li> <li>○ Check whether impacts forecasted by IEE occurred and, if so, the extent</li> <li>○ Check whether the mitigation measures implemented were effective at controlling adverse impacts and enhancing benefits</li> <li>○ Check overall performance of the implementation activities</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• The purpose of environmental audit is as per the list on the slide</li> </ul>	1.5															
63. Audit Approach	<ul style="list-style-type: none"> <li>• In general a framework will be prepared for planning the environmental audit</li> <li>• The audit plan contains parameters, indicators, location method, and sources</li> <li>• The audit should be conducted by an environmental specialist</li> </ul>	<ul style="list-style-type: none"> <li>• Audit approach is based on DoR, GESU, 2008. ESMF.</li> <li>• Audit approach requires preparation of general frame work for planning the audit</li> <li>• An audit plan must then be prepared, an example audit plan will be covered in the next slide</li> </ul>	2															
64. Example Environmental Audit Plan	<p>Table</p> <table border="1"> <thead> <tr> <th>Parameters</th> <th>Indicators</th> <th>Location</th> <th>Method</th> <th>Sources</th> </tr> </thead> <tbody> <tr> <td colspan="5" style="text-align: center;"><b>A. Physical Environment</b></td> </tr> <tr> <td>Disposal of spoils</td> <td>Affected cultivated land, aesthetic value, forest</td> <td>Designated sites</td> <td>Observation /consultation</td> <td>Local people, observation, Photographs</td> </tr> </tbody> </table>	Parameters	Indicators	Location	Method	Sources	<b>A. Physical Environment</b>					Disposal of spoils	Affected cultivated land, aesthetic value, forest	Designated sites	Observation /consultation	Local people, observation, Photographs	<ul style="list-style-type: none"> <li>• Slide shoes example of environmental audit plan format as given in DoR, GESU, 2008. ESMF, DoR</li> <li>• The table has five columns; parameters, indicators, location, method, and sources</li> <li>• Parameters – the work / activities which will be conducted</li> <li>• Indicators – the effects such activities may have which audit should identify if present</li> <li>• Location – where the work will be carried out</li> <li>• Method – how potential effects should be audited</li> <li>• Sources – sources used for audit</li> <li>• Run through examples in table on slide</li> </ul>	1
Parameters	Indicators	Location	Method	Sources														
<b>A. Physical Environment</b>																		
Disposal of spoils	Affected cultivated land, aesthetic value, forest	Designated sites	Observation /consultation	Local people, observation, Photographs														
65. End	End of Presentation	10 minutes are allowed at the end of the presentation for questions	10															

